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Why negative affectivity (and self-deception) should be included in job stress research: bathing the baby with the bath water

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Introduction

In this volume, Spector, Zapf, Chen and Frese present a compelling argument that negative affectivity (NA) should not be viewed as a 'nuisance factor' in job stress research. They recommend that future researchers treat trait NA as a substantive factor in stress research. Spector *et al.* go on to discuss six mechanisms through which NA might substantively affect job stressors and strains. We concur with Spector *et al.* that it is important for future stress research to investigate the substantive role of NA. However, perhaps unlike Spector *et al.*, we believe that NA can be both a substantive and biasing factor at the same time. In this paper, we investigate one of the theoretical models discussed by Spector *et al.* that we believe may explain the biasing effect of NA—the perception mechanism. According to Spector *et al.*, the perception mechanism would explain the relationship between NA and stress because high NA people see the world in a negative way (i.e., perceive more stress and strain, even in the absence of such conditions). Spector *et al.* further argue that even if NA affects perceptions, this does not necessarily demonstrate that such perceptions are biased. For example, if John—a high NA person—sees his job as very stressful, while most other individuals working in this job do not consider it to be stressful, how can one demonstrate that John's view of his job is biased? According to Spector *et al.*, one cannot answer this question because John's perceptions may reflect his reality as well as (or better than) the average coworker.

On this issue, we disagree with Spector *et al.* We believe that there are constructs of objective stress, objective reports of stressors, and actual health. We further believe that NA is likely to be correlated with the difference between the actual level of these conditions and the subjective

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appraisal of these conditions. For example, research has shown that NA is substantially correlated with reports of health problems, but is not related to objective measures of health (Dua, 1994; Smith, Wallston and Dwyer, 1995; Spector, 1987; Watson, Pennebaker and Folger, 1987). If this does not represent a bias, then what does it represent? To be sure, studies explicitly relating NA to the differences between objective conditions and subjective appraisals have been absent in the literature. But this does not mean that such studies could not be conducted. There is another issue. What sort of bias does NA represent? Is NA a negative bias, representing unrealistic negative perceptions of stimuli, or is it the lack of a positive bias, i.e., not having an unrealistically positive perception of stimuli? Admittedly, this is a difficult question to answer. Several researchers (Marco and Suls, 1993; Watson and Clark, 1984; Watson and Pennebaker, 1989) have suggested that NA represents a true negative-bias. It may be that high NA individuals unrealistically see events in a more negative light and therefore report more stress and health complaints (possess a negative bias). On the other hand, another possibility is that high NA individuals simply lack the *positive* bias of low NA individuals and therefore judge events in a more negative but also more realistic manner. In fact, Brief, Butcher and Roberson (1995) supported this prediction in terms of job attitudes. Brief *et al.* (1995) found that NA blocked the effect of positive events on job satisfaction. This implies that NA might negatively influence attitudes by blocking positive perceptions rather than enhancing negative perceptions. Because it is possible that both positive and negative biases may exist, both types of biases should be included in the study of stress. However, past stress research has not examined the role of positive biases; perhaps we have tended to treat NA as merely a 'nuisance factor'. As Spector *et al.* correctly point out, treating NA this way does little to address the bias hypothesis, or even advance conceptual understanding of the role of NA in stress research.

One example of a positive bias that is associated with low NA (Roth and Ingram, 1985; Sackeim and Gur, 1979), and may influence perceptions of stress, is self-deception. Sackeim and Gur (1979) defined self-deception as the unconscious tendency to see oneself in a positive light while denying information that threatens the self. This unconscious tendency manifests itself in behaviors directed at maintaining a range of positive views of oneself. In order to maintain their positive attitudes, self-deceivers tend to ignore minor criticism, discount failures, and avoid negative thoughts (Zerbe and Paulhus, 1987). Thus, it is possible that individuals who tend to deceive themselves also ignore minor stressful events and discount minor health problems because such thought processes help them maintain positive attitudes. This suggests that self-deception should be included in stress research as a positive bias in the reporting of health complaints.

In this commentary, we build on the perception mechanism discussed by Spector *et al.* by investigating the role that NA and self-deception play in influencing reports of stress and health complaints. For the purposes of this paper we use the term stress to refer to the perception of stress rather than behavioral manifestations (e.g., physiological or behavioral responses) of anxiety. Because NA is a different theoretical construct than is self-deception, these variables are assessed separately and, along with stress, are related to health complaints.

Conceptual model

In an effort to investigate the substantive role played by NA and self-deception in stress research, we developed a conceptual model. The model is displayed in Figure 1. Consistent with past

research (e.g., Clark and Watson, 1988; Jex and Beehr, 1991; Watson and Clark, 1984; Watson and Pennebaker, 1989), our model includes a link from NA to stress, and from NA to health complaints. Past research consistently has demonstrated that stress is related to somatic complaints (DeLongis *et al.*, 1982; Pearlin *et al.*, 1981). Thus, we also include a link from stress to health complaints. We include a link from NA to self-deception because it has been suggested that low NA individuals may deny their undesirable self-perceptions (Taylor, 1989). Thus, while high NA individuals scan for negative signs in the environment (Watson and Clark, 1984), other research suggests that low NA individuals actively scan for positive information and ignore information harmful to the self (Taylor and Brown, 1988). We also include links from self-deception to stress and to health complaints, because individuals who have tendencies to view themselves in an overly positive manner (self-deceivers) should be less likely to be influenced by stress (Zerbe and Paulhus, 1987), and less likely to report somatic complaints (Linden, Paulhus and Dobson, 1986).

What are the processes by which NA and self-deception lead to bias in the reporting of stress and health complaints? One of the psychological explanations supporting the biasing effect of NA on health complaints is provided by Watson and Pennebaker's (1989) symptom perception hypothesis, where high NA individuals are more likely to complain about their health (in addition to other aspects of their lives), and they may exaggerate or overreact to their health concerns. Thus, even if two individuals perceive the same level of health problem, the individual with the highest level of NA may be more likely to complain about, or overreact to, these problems. However, a large and growing body of findings, mostly within social psychology, indicates that well-adjusted individuals regularly use distortive mechanisms. For example, research in the area of 'positive illusions' (see Taylor and Brown, 1988) has suggested that non-depressed individuals are more susceptible to self-serving biases than depressed individuals (e.g., Alloy and Abramson, 1979). Others have found that normal individuals are more prone to unrealistic optimism, egocentric attributions, illusion of control, and hindsight bias (Greenwald, 1980; Weinstein, 1980). In sum, there is ample evidence that normal individuals utilize biases to maintain and maximize positive aspects of their lives and to

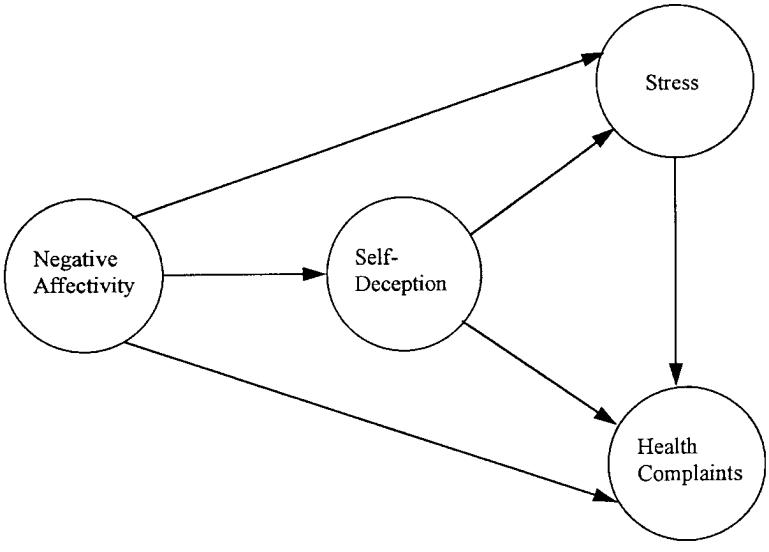

Figure 1. Hypothesized structure of negative affectivity, self-deception, stress, and health complaints

minimize negative aspects. Maladjusted (e.g., depressive, neurotic) individuals, on the other hand, do not tend to use the same biases (Alloy and Abramson, 1979; Roth and Ingram, 1985; Sackeim and Gur, 1979). It is therefore suggested that high NA individuals do not manifest the 'ego-enhancing' biases of low NA individuals. Therefore, in terms of stress and health complaints, we believe that high NA individuals will be less prone to use self-deception, and will therefore report more stress and health problems than low NA individuals. Accordingly, at least part of the influence of NA on stress and health complaints should be explained through self-deception.

Testing the substantive bias hypothesis

Methodology

In order to test the substantive role of NA and self-deception in the reporting of stress and health complaints, we collected data from a large public university located in the Midwest. Subjects ($n = 224$) occupied a wide range of non-academic positions within the university. In an attempt to remove the possibility that the relations observed were due to self-report bias, a significant other was asked to complete an evaluation of focal employee NA. Research on other reports indicates that observers provide valid assessments of personality constructs (Mount, Barrick and Strauss, 1994), particularly when the rater is well acquainted with the target individual (Funder and Colvin, 1988). Two-hundred-and-fourteen usable significant other surveys were returned. Therefore, both self-report and significant other data were available for 214 employees.

We used standard measures of the constructs in the study. Total life stress was measured by the Perceived Stress Scale (Cohen, Kamarck and Mermelstein, 1983; $\alpha = 0.77$). Negative affectivity was measured using the NA portion of the Positive and Negative Affect Schedule (PANAS; Watson, Clark and Tellegen, 1988; $\alpha = 0.85$ for self-report and $\alpha = 0.86$ for the significant other report). Self-deception was measured using two instruments: the Self-Deception Questionnaire (SDQ; Sackeim and Gur, 1978; $\alpha = 0.84$) and the Balance Inventory of Desirable Responding (BIDR; Paulhus, 1984; $\alpha = 0.69$). Finally, health complaints were measured by a scale originally used in the Quality of Employment Surveys that asks respondents to include the degree to which they had experienced 16 somatic symptoms within the last year (QES; Quinn and Staines, 1979; $\alpha = 0.85$).

Covariance structure models, estimated in the present study with LISREL 7 (Jöreskog and Sörbom, 1989), were used as the method of analysis. Covariance structure models allow the specification and estimation of the structural model hypothesized to account for the observed data.

Results

Before reporting the results of the models relating NA, stress, and health complaints to one another, we estimated several measurement models to verify that the measures of the constructs are distinct (i.e., not essentially measures of the same construct). Consistent with the results of previous studies (e.g., Schaubroeck, Ganster and Fox, 1992), the results suggested that the measures are distinct. NA and stress do not appear to measure the same construct. (Due to space limitations, we do not report the results in detail here. However, the results are available from the

authors on request.) Having demonstrated that the measures of NA and stress were distinct, we next proceed to estimate the hypothesized structural models.

Four structural models were developed in order to test the hypotheses. In each of the four models we fixed to zero some of the links between the constructs, according to the specific hypothesis under investigation. The models are nested and therefore allow comparisons among them. Figure 2 represents the structure of the most fully saturated model (Model 4). The parameter estimates and fit statistics from the estimations are provided in Table 1. In the first model (Model 1) we were interested in the relationships between stress and health complaints. Thus, in this model we freed the link from stress to somatic complaints and from NA to self-deception. All the other possible relationships between the constructs were fixed to zero. As the first column of Table 1 indicates, the stress → somatic complaints link was strong, positive, and highly significant and the NA → self-deception link was strong, negative, and also highly significant. The fit statistics from the estimation of Model 1 suggest that it provides a marginal fit to the data. In the second model we freed links from NA to stress, NA to health complaints, NA to self-deception, and from stress to health complaints. The results from this estimation, provided in the second column of Table 1, reveal that the stress → health complaints and the NA → stress links were strong, positive, and highly significant. As in Model 1, the NA → self-deception link was strongly negative. The NA → health complaints link was moderate in magnitude but still statistically significant ($p < 0.05$). NA was positively associated with stress and health complaints, and stress was positively associated with health complaints. A comparison between Model 1 and Model 2 demonstrated that although the relationship between stress and health complaints decreased considerably as a result of 'including' NA in the model, this relationship remained significant. These results are consistent with past research (Schaubroeck *et al.*, 1992). The fit statistics for Model 2 suggest that it provides an adequate, though not exemplary, fit to the data.

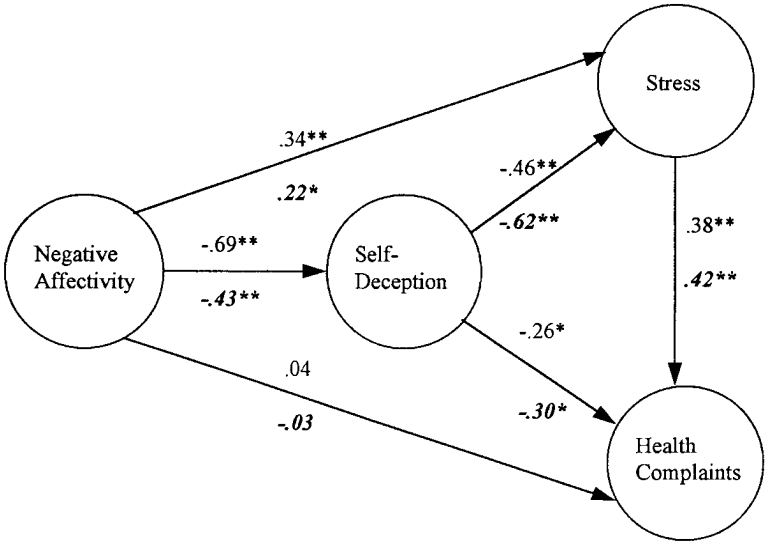

Figure 2. Estimated structural Model 4 with self-reports and significant other reports of negative affectivity (NA). (*Note*: Coefficients from model estimated using significant other reports of NA appear directly below [in bold italics] coefficients from self-reported model; $*p < 0.05$; $**p < 0.01$.)

Table 1. Parameter estimates and fit statistics of structural models

Estimate	Model 1	Model 2	Model 3	Model 4
Parameter Estimates				
Negative affectivity → stress	–	+0.683†	–	+0.340†
Negative affectivity → health complaints	–	+0.176*	–	+0.040
Stress → health complaints	+0.583†	+0.475†	+0.301†	+0.380†
Self-deception → stress	–	–	−0.787†	−0.460†
Self-deception → health complaints	–	–	−0.371†	−0.260†
Negative affectivity → self-deception	−0.671†	−0.707†	−0.770†	−0.690†
Fit statistics				
Chi-square (χ^2)	200.42†	91.99†	76.03†	68.01†
Degrees of freedom	42	40	40	38
Comparative fit index (CFI)	0.880	0.964	0.970	0.979

Note: *$p < 0.05$; †$p < 0.01$.

In the third model (Model 3), we allowed relationships from self-deception to stress and to health complaints, from stress to health complaints, and from NA to self-deception. The third column of Table 1 provides the results from this estimation. The stress → health complaints link was positive and significant while the self-deception → stress and self-deception → health complaints links were negative and highly significant. (As with the other models, the NA → self-deception link was strongly negative.) Although standards for judging differences in measures of practical fit have not been developed, Widaman (1985) has suggested that differences between models in either CFI of more than 0.01 should be considered important for practical purposes. Accordingly, the fit statistics associated with the estimation of Model 3 were better than those for Models 1 or 2.

The last column of Table 1 provides the parameter estimates of the fourth model (Model 4). The direct effect of NA on stress, and of NA on somatic complaints depicted in Model 2, dropped considerably in Model 4 when self-deception was introduced. However, the total effects (indirect effects through self-deception combined with direct effects) of NA on stress and health complaints were similar to the total effects depicted in the second model (see Table 2). Since Model 4 demonstrated better fit indices (see Widaman, 1985) than Model 2, we can conclude that self-deception partially mediates the relationship between NA and stress and completely mediates the relationship between NA and health complaints. A significant part of the relationship between

Table 2. Direct, indirect and total effects of negative affectivity (NA) on stress and health complaints in structural Model 4

Effect	Coefficient
Effects of NA on stress	
Direct effect	+0.342†
Indirect effect through self-deception	+0.318†
Total effect	+0.660†
Effects of NA on health complaints	
Direct effect	+0.045
Indirect effect through self-deception	+0.181*
Indirect effect through stress	+0.251†
Total effect	+0.477†

Note: *$p < 0.05$; †$p < 0.01$.

NA and stress and health complaints is due to self-deception. The fit statistics from the estimation of Model 4 indicate that it provides a superior fit to the data compared to Models 1 and 2, and a comparable (although somewhat better) fit compared to Model 3. In fact, the χ^2 associated with Model 4 was significantly lower than that for Model 3 (decrease in $\chi^2 = 7.98$ with 2 *df*, $p < 0.05$).

The relationships represented in the four structural models also were estimated using significant other reports of NA. In these models, three indicators of NA as reported by significant other were loaded on the NA construct. As before, the constructs of self-deception, stress, and health complaints were estimated using self-report data. The results from these models were similar to the results of the self-report models. In fact, coefficients did not change in significance in any of the models. Figure 2 provides the results from the full model (Model 4) estimation using self-reports and the same model estimation using significant other reports of NA. Estimates from the model using significant other reports of NA appear directly below (in bold italics) the estimates from the self-report model. As the Figure shows, using significant other reports of NA had little effect on the estimates within the model. Furthermore, the fit statistics from this estimation suggested that the model provided an excellent fit to the data ($\chi^2 = 53.65$ with 38 *df*; CFI = 0.99). These models indicate that our results were also valid when we controlled for common method variance.

Discussion

Spector *et al.* have argued that the relationship of NA with job stressors and strains are not inflated by NA bias. To the extent that one views bias as a purely (and merely) statistical process, we agree with Spector *et al.* However, we believe that NA has an important substantive biasing role in the self-reporting of stress and strain. The stress literature to data has investigated the role of NA as a possible unmeasured contaminating factor in stress–stress outcomes relationships. The assumption underlying this line of research is that, at least in part, stress does not really cause strain. In this study we argued that a somewhat different interpretation could be given to the results of former studies. If low NA individuals tend to discount stressful events and health problems, their true levels of stress and health symptoms actually may be underemphasized. On the other hand, if high NA individuals do not tend to underemphasize stress and health problems their reported stress level and health problems may tend to be more genuine. As pointed out by Spector *et al.*, high NA persons tend to be more (not less) accurate in assessing their environmental surroundings (Alloy and Abramson, 1979; Sacco, 1985; Sinclair, 1988). Consequently, since high NA individuals tend to report higher levels of stress and more health problems, controlling for NA as a single bias measure can give the erroneous impression that NA inflates the stress–stress outcomes relationships. In fact, in this case NA controls for the *deflation* and not the *inflation* in the stress–stress outcomes relationships. In order to determine whether NA negatively biases the stress–somatic complaints relationships or only controls for the positive bias associated with high NA, stress studies should include measures of positive, as well as negative, biases.

In this study we used self-deception as a general tendency to engage in positive biases. All in all, our results supported the claim that positive biases play a significant role in the stress–stress outcomes relationships. In fact, this study's results suggest that self-deception may be as important a construct as NA in stress research. In both of the models that controlled for self-deception (Models 3 and 4), self-deception was highly negatively related to stress and health

complaints. Those individuals who tend to deceive themselves were found to report less stress and complained less about health problems. Besides being empirically relevant, the inclusion of self-deception has some major theoretical advantages. A principal weakness of the 'inflation' explanation is that it was never clear *how* NA influences stress and health complaints (a psychological bother or a theoretical variable?). On the other hand, the influence of self-deception on the stress–stress outcomes relationships is clear because self-deception, by definition, represents biased thinking. Self-deceivers tend to react faster to positive stimuli and slower to negative stimuli (Paulhus and Levitt, 1987). They ignore minor criticism, discount failures, and avoid negative thoughts. In turn, self-deceivers not only report less stress and health complaints but also cope better with stress and pay less attention to health problems (Linden *et al.*, 1986; Paulhus and Levitt, 1987). Thus, self-deception is not a psychometric bother but rather a direct measure of bias that is substantively relevant to the stress–stress outcomes relationships.

Theoretically, self-deception also explains part of the influence of NA on the stress–stress outcomes relationship. The results revealed that approximately half of the influence of NA on stress, and nearly all of the influence of NA on health complaints, is mediated through self-deception. These results suggest that the 'deflation' explanation is warranted. Although this study did not (and could not) directly demonstrate that low NA individuals underemphasize actual stressful events and health problems, the strong mediation effect of NA on stress and somatic complaints through self-deception is suggestive of such an interpretation. Low NA individuals tended to deceive themselves and were less stressed while high NA individuals tended not to deceive themselves and were more stressed. Low NA individuals also tended to deceive themselves and complained less about health problems while high NA individuals did not tend to deceive themselves and complained more about health problems. Consequently, these results suggest that low NA individuals deflated stressful events and health problems through self-deception. Future research would benefit from directly exploring this explanation. However, even more beneficial from a practical point of view would be to investigate the thought processes by which low NA individuals deflate stress and health problems. Ignoring stressful events and health problems is very different from discounting them as unimportant because the former means denial while the latter implies some level of awareness. In the case of health problems this difference could be detrimental.

In addition, it is important to determine if the fact that low NA individuals deceive themselves and were therefore less stressed (as well as complained less about health problems) excludes the possibility that high NA individuals are negatively biased. Our study did not imply this conclusion. On the contrary, the fact that the relationship between NA and stress remained significant even after controlling for self-deception implies that NA positively influences stress. Thus, high NA individuals not only do not deceive themselves to decrease stress, but rather, may exaggerate their level of stress. Consequently, Watson and Clark's (1984) conclusion that high NA individuals react more strongly to stressful situations than low NA individuals was supported in our study. Moreover, the fact that NA and self-deception exhibited opposite effects on the stress–somatic complaints relationship indicated that high NA individuals not only are less prone to positive biases but may even see stress where it does not exist. Thus, NA may be the negative bias component in the perception of stress.

Finally, it is also possible that positive affectivity (PA, the tendency of individuals toward position emotions such as energy, enthusiasm, alertness, and determination) may also impact stress perceptions through self-deception and similar cognitive mechanisms. Although PA and NA have generally been thought to have different patterns of correlates (Costa and McCrae, 1980; Warr, Barter and Brownbridge, 1983; Watson *et al.*, 1987), some studies have shown significant, negative relationships between PA and stress (Watson, 1988). Positive emotionality has also been

shown to be related to optimism (Chang and D'Zurilla, 1996; Chang, Maydeu-Olivares and D'Zurilla, 1997), and locus of control (Emmons and Diener, 1985; Langston, 1994; Warehime and Woodson, 1971), suggesting that PA might also influence self-deception, and hence stress perceptions. Accordingly, additional multivariate studies investigating the independent effects of both PA and NA on cognitive processes associated with stress and health perceptions are warranted.

On one major point we agree with Spector *et al.*—in future stress research, NA should not be treated as simply a statistical 'nuisance factor', but should be substantively investigated in its own right. On the issue of whether NA may represent a substantive bias affecting the reporting of stress and health complaints, we may part company with Spector *et al.* We believe that NA is a distal biasing factor affecting the reporting of stress and health complaints. We further think, and believe our results show, that self-deception is the more proximal biasing factor. In short, we agree with Spector *et al.* that NA must be investigated substantively but, unlike Spector *et al.*, would argue that a bias (such as NA and self-deception) can be substantively meaningful. As Brief *et al.* commented in their important 1988 paper, "... NA may not be just a psychometric bother but, rather, a theoretical variable with which to be reckoned" (p. 197). One of the most important potential contributions of the Spector *et al.* paper is their development of a number of conceptual processes that may explain the theoretical role of NA in stress research.

We must acknowledge that this study does not prove that NA is a biasing factor. One would need objective reports of stressors or health-related difficulties (e.g., Dua, 1994; Smith *et al.*, 1995; Spector, 1987) to do that. Future research should obtain objective reports of these conditions and investigate whether NA and self-deception are correlated with differences between objective and subjective measures of these constructs.

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