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Positive Automatic Cognitions as Moderators of the Negative Life Event–Dysphoria Relationship[1]

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In this study, the author tested the hypothesis that positive automatic thoughts and the Positive Automatic Thoughts × Negative Life Stress interaction would predict dysphoria. The Automatic Thoughts Questionnaire—Positive, the Automatic Thoughts Questionnaire, the Life Experiences Survey, and the Beck Depression Inventory, were administered to 71 undergraduate volunteers. In hierarchical regression analyses, positive thoughts accounted for unique variance in dysphoria, over and above the variance accounted for by negative life stress and negative thoughts. Furthermore, for higher levels of positive cognitions, negative life stress had a reduced association with dysphoria, which suggested that, as hypothesized, positive cognitions may serve as stress-buffers. Positive automatic cognitions appear to be conceptually viable and may help to account for varied emotional reactions to life stress.

KEY WORDS: dysphoria; depression; stress; cognitions; vulnerability.

Depression is one of the most common forms of psychopathology, affecting to some extent as many as one in five adults at any given time (Coyne, 1985). Given this prevalence, it is not surprising that much research has focused on environmental factors that are associated with, and predict, depression. Researchers have found, in this regard, that stresses such as nega-

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tive life events consistently correlate with or predict depression (Paykel, 1974; Paykel et al., 1969; Sarason, Johnson, & Siegel, 1978).

Although environmental stress predicts depression, however, not everyone who experiences such stress becomes depressed. Researchers have therefore exerted much effort in attempts to ascertain factors which may account for these diverse individual reactions to stress. Most such research has focused on factors thought to exacerbate the impact of stress. In the diathesis–stress hypothesis of the cognitive theory of depression, for example, dysfunctional beliefs are hypothesized to interact with stress and thereby to foster or activate depression (Beck, 1967; Beck, Rush, Shaw, & Emery, 1979). Some studies have found that the relationship between stress and depression does indeed depend on the level of beliefs (Kwon & Tian, 1992; Olinger, Kuiper, & Shaw, 1987; Pagel & Becker, 1987; Smith, Boaz & Denney, 1984; Wise & Barnes, 1986). Recent evidence, however, has begun to suggest that negative thoughts, as differentiated from beliefs, may act as vulnerability factors (Olioff, Bryson, & Wadden, 1989; Stiles & Gotestem, 1989).

Yet stressful life events, dysfunctional beliefs, and negative cognitions do not account for all of the variance in depression, nor do Stress × Belief interaction terms consistently predict variance in depression (e.g., Barnett & Gotlib, 1988, 1990; Hamilton & Abramson, 1983; Persons & Rao, 1985; Robins & Block, 1989). Furthermore, a focus only on potential exacerbating factors, though necessary, is logically insufficient to account for the full range of reactions to stress. That is, logic suggests not only stress intensifiers but stress buffers may be salient to depression.

Indeed, theory suggests the existence of positive schemata, cognitive factors that may buffer the impact of stress. For example, in his early writings, Beck (1967) postulated the existence of positive or self-enhancing self-concepts which, when activated, result in favorable self-regard. More recently, Beck and his colleagues have suggested that positive schemas may provide coping mechanisms (Beck & Weishaar, 1989). Furthermore, progress from a negative cognitive set to a positive cognitive set may be central to recovery from depression (Beck, 1985).

Empirical evidence, too, suggests the existence of positive schemata. Nondepressed persons evince a self-enhancing bias that enables them to perceive themselves more positively than others perceive them (Lewinsohn, Mischel, Chaplin, & Barton, 1980) and to overestimate probability of success (Alloy & Ahrens, 1987). Depressed persons, in contrast, are more realistic in their self-appraisals (Alloy & Ahrens, 1987; Lewinsohn et al., 1980). Some authors have proposed, in view of such results, that a self-enhancing bias may be necessary for positive mental health (Taylor & Brown; cited in Dobson & Franche, 1989).

Positive cognitions may foster such enhanced self-perceptions and may function as the positive schemata postulated by Beck and his colleagues (Beck & Weishaar, 1989). A growing body of evidence suggests that optimism, which has been equated with positive thinking, is inversely related to, and predicts, depression (see Scheir & Carver, 1992, for a review). In a related vein, high self-esteem, which may be related to positive thinking, could be associated with immunity to depression (Pagel & Becker, 1987).

Positive cognitions are inversely related to varied psychological problems including social anxiety (Heimberg, Acerra, & Holstein, 1985) and depression (Missel & Sommer, 1983), and are directly related to immediate positive well-being (Goodhart, 1985). Other researchers (Heimberg, Bruch, Hope, & Dombeck, 1990; Missel & Sommer, 1993; Schwartz, 1986; Schwartz & Garamoni, 1989) have marshaled evidence that, compared to dysfunctional persons, functional persons are characterized not only by lower levels of negative cognitions but by higher levels of positive cognitions and by greater proportions of positive to negative + positive thoughts. Upon finding that positive cognitions had an inverse relationship to depression and to level of depression, Ingram and Wisnicki (1988) proposed that positive cognitions may "serve a coping function in that individuals who generate such thoughts in response to negative events may be able to prevent depression from reaching significant levels" (Ingram & Wisnicki, 1988, p. 902). Subsequent research (Ingram, Atkinson, Slater, Saccuzzo, & Garfin, 1990) supports this possibility.

In summary, both theory and empirical evidence suggest the existence of positive schemata, which may buffer the effects of stress on depression. Circumstantial evidence suggests that positive thinking, a largely unexplored construct, may act as such a stress buffer. Exploration of this possibility appears especially advisable in light of recent evidence that negative thoughts may act as stress-exacerbators or vulnerability factors. If the Positive Thoughts × Negative Life Events interaction predicts depression such that, for more frequent positive thoughts, negative events have an attenuated association with depression, the thesis that positive cognitions buffer the effects of life stress would be supported. Such a finding could have important implications both for clinical practice and for the cognitive theory of depression.

Prior to presenting hypotheses about the relationship between positive cognitions and depression, however, a word of clarification is in order. In many of the aforementioned studies, the term *depression* was used to indicate the negative mood state measured by the Beck Depression Inventory (e.g., Barnett & Gotlib, 1990; Ingram and Wisnicki, 1988; Kwon & Tian, 1992; Wise & Barnes, 1986). An elevated Beck Depression Inventory score, however, does not indicate nosologic depression but

rather syndrome depression or dysphoria (Kendall, Hollon, Beck, Hammen, & Ingram, 1987). Therefore, in light of recent recommendations (Kendall et al., 1987), and in order to avoid terminological confusion, the term *dysphoria* will henceforth be used to characterize the construct of interest in the present study.

In light of the foregoing, it is hypothesized that (a) positive automatic cognitions account for unique variance in dysphoria score over and above the variance accounted for by stressful life events and negative automatic cognitions; higher levels of positive automatic cognitions are associated with lower future dysphoria, while lower levels of positive cognitions are associated with higher future dysphoria; (b) the Positive Automatic Cognitions × Negative Life Events interaction accounts for a significant increment in dysphoria above all main effects, such that, for higher levels of positive cognitions, life stress has a reduced association with dysphoria. Since negative cognitions are known to correlate with (Hollon & Kendall, 1980) and predict (Olioff et al., 1989) dysphoria, they are entered prior to positive cognitions in regression analyses. This constitutes a more stringent test of the ability of positive cognitions to predict dysphoria.

METHOD

Participants

Seventy-eight undergraduate volunteers at a large mid-Eastern American university participated in the study. Protocols of six participants were invalid due to errors in following instrument instructions; these persons were excluded for analyses. A single outlier with a standardized residual of 3.76 standard deviations above the mean in regressions was also excluded. The resultant sample consisted of 31 males and 40 females with a mean age of 21.20 (SD = 1.72) and an age range of 17 to 28. The sample represented students from all colleges within the university.

Instruments

The Beck Depression Inventory (BDI; Beck et al., 1979). The BDI is a commonly used 21-item self-report measure that assesses cognitive, affective, motivational, and physiological aspects of syndrome depression. Reliability and validity coefficients of the BDI have been found to be high

(Beck, Steer, & Garbin, 1988). Moreover, the BDI has been found to be a reliable and valid measure of depression in college students (Bumberry, Oliver, & McClure, 1978).

The Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980). The ATQ is a 30-item self-report measure that assesses the frequency of negative thoughts or self-statements associated with depression (Hollon & Kendall, 1980). Split-half reliability, calculated on odd versus even items, was found to be .97, and coefficient alpha was .96 (Hollon & Kendall, 1980).

The Automatic Thoughts Questionnaire-Positive (ATQ-P; Ingram & Wisnicki, 1988). Designed as a theoretical complement to the ATQ, the ATQ-P measures positive automatic cognitions. Pearson correlations of each item with the total score ranged from .42 to .75. Coefficient alpha was found to be .94, while split-half reliability for odd and even items was .95. In their initial evaluation of the ATQ, Ingram and Wisnicki (1988) randomly combined the ATQ-P items with the original ATQ items for administration. This format was retained in the present study.

The Life Experiences Survey (LES; Sarason, Johnson, & Siegel, 1978). The LES is a 57-item questionnaire designed to assess the degree of positive and negative change or stress. Each LES item constitutes an event; the respondent is asked to rate the degree of positive or negative impact of events he/she has experienced in the last year. Impact ratings are made on a 7-point scale that ranges from *extremely negative* (–3) to *extremely positive* impact (+3). A negative stress score is derived by adding negative scores, while a positive stress score is derived by adding positive item ratings. Test–retest reliability estimates over 5- to 6-week intervals were found to be .19 and .53 for the positive stress score, .56 and .88 for the negative stress score, and .63 and .64 for the total stress score (Sarason et al., 1978). The negative stress score, but not the positive stress score, appears to be related to indices of dysfunction. Therefore, only the negative score is included in analyses for testing hypotheses.

Procedures

Undergraduate introductory psychology volunteers were recruited utilizing posted signup lists and verbal description of the research in classes. Order of instruments within packets was randomized; assignment of packets to participants was also randomized. After brief verbal instructions and signing of consent forms, all instruments were administered and completed by participants in group testing sessions. Participants received extra credit after completing and returning the instrument packet.

RESULTS

Preliminary Analyses

Means and standard deviations on all instruments are presented in Table I. One-way analysis of variance was utilized to compare mean scores on all instruments according to gender and college. Because no statistically significant differences were found, and in order to maximize power, demographic variables were not included in subsequent regression analyses. Correlations among variables are presented in Table II.

Table I. Descriptive Statistics[a]

Variable	Mean	*SD*	Minimum	Maximum
BDI	9.44	7.53	.00	34.00
ATQ	58.96	20.47	30.00	129.00
ATQ-P	86.63	25.15	35.00	141.00
LESNEG	-9.66	7.57	-30.00	.00
LESPOS	9.20	6.54	.00	29.00

[a]N = 71. BDI = Beck Depression Inventory; ATQ = Automatic Thoughts Questionnaire; ATQ-P = Automatic Thoughts Questionnaire—Positive; LESNEG = Life Experiences Survey Negative Life Stress; LESPOS = Life Experiences Survey Positive Life Stress.

Table II. Pearson Product Moment Correlation Coefficients[a]

Instruments	1	2	3	4	5
1. BDI	—	.77[c]	-.35[b]	-.64[c]	-.33[b]
2. ATQ		—	-.23	-.46[c]	-.30[b]
3. ATQ-P			—	.07	.20
4. LESNEG				—	.12
5. LESPOS					—

[a]N = 71. BDI = Beck Depression Inventory; ATQ = Automatic Thoughts Questionnaire; ATQ-P = Automatic Thoughts Questionnaire—Positive; LESNEG = Life Experiences Survey Negative Life Stress; LESPOS = Life Experiences Survey Positive Life Stress.
[b]$p < .01$.
[c]$p < .001$ (one tailed).

Positive thoughts as measured by the ATQ-P were correlated with dysphoria, but were not correlated with negative thoughts, positive life event stress, or negative life event stress.

Multiple-Regression Analyses

Table III presents results of the hierarchical multiple-regression analyses. Variables are listed in order of entry into the regression. The *F* test for the R^2 increment associated with positive thoughts tests the unique variance in dysphoria accounted for by positive thoughts, above the variance accounted for by predictors entered at previous steps.

As predicted, the ATQ-P accounted for a significant increment in R^2 over the variance accounted for by the ATQ. Less frequent positive thoughts were associated with greater dysphoria, while more frequent positive thoughts were associated with less dysphoria. Also as predicted, the Positive Thoughts × Negative Life Events interaction accounted for significant incremental variance in BDI scores. In order to depict this interaction graphically, predicted BDI scores were obtained for all combinations of high (1 *SD* above the mean) and low (1 *SD* below the mean) values of ATQ-P and LES negative life stress (e.g., high ATQ-P and high LES, low ATQ-P and high LES, etc.), while values of other independent variables were held constant at mean values. Figure 1 represents a plot of these values and illustrates the interaction. For higher levels of positive cognitions, negative life events are less predictive of (i.e., have a reduced association with) dysphoria. Thus, as hypothesized, the ability of negative life stress to predict concurrent dysphoria depends on the level of positive cognitions.

Table III. Hierarchical Multiple-Regression Analysis for Testing Main Hypotheses, with Beck Depression Inventory as Dependent Variable[a]

Predictors	*df*	R^2 change	*F*	*p*
1. LESNEG	1	.4090	47.748	.000
2. ATQ	1	.2875	64.396	.000
3. ATQP	1	.0373	9.396	.003
4. ATQ × LESNEG	1	.0029	0.720	.399
5. ATQP × LESNEG	1	.0328	9.241	.003
Residual	65	Mean square	14.060	

[a]LESNEG = Life Experiences Survey Negative Life Stress; ATQ = Automatic Thoughts Questionnaire; ATQP = Automatic Thoughts Questionnaire—Positive; × = interaction term.

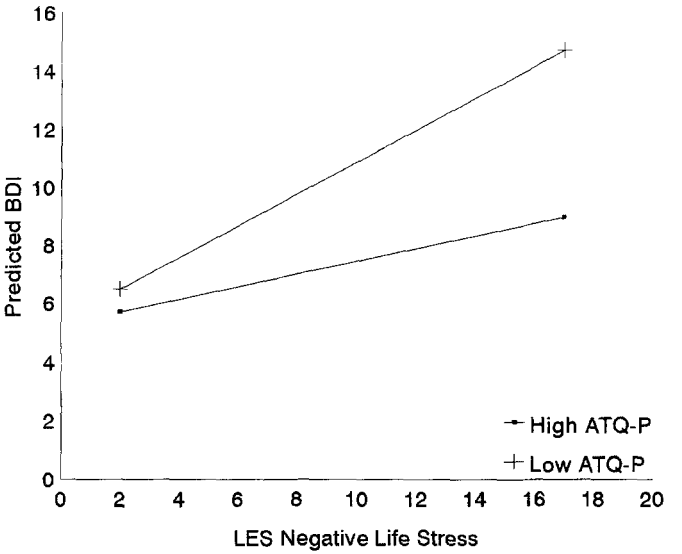

Fig. 1. Regression line of Beck Depression Inventory (BDI) scores on Life Experiences Survey (LES) Negative Life Stress scores for high and low levels of positive automatic cognitions (life stress scores are depicted as positive rather than negative for ease of illustration). ATQ-P = Automatic Thoughts Questionnaire—Positive.

DISCUSSION

This study replicated and extended the findings of Ingram and Wisnicki (1988). Positive cognitions as measured by the ATQ-P were correlated with dysphoria, but not with negative thoughts as measured by the ATQ. Positive cognitions also were uncorrelated with positive and negative life event stress.

Regression analyses confirmed that positive automatic thoughts accounted for significant incremental variances in dysphoria over and above the variances accounted for by negative automatic thoughts and life stress. Less frequent positive automatic thoughts were associated with greater dysphoria, while more frequent positive automatic thoughts were associated with lesser dysphoria. The significant Positive Automatic Cognitions × Negative Life Event Stress interaction term indicated that the ability of negative life stress to predict concurrent dysphoria depended on the level of positive automatic cognitions. Specifically, for higher levels of positive automatic cognitions, there was a reduced association between negative life stress and dysphoria.

These findings indicate that positive cognitions help to explain concurrent dysphoria. Thus, positive thoughts must be considered in any full account of dysphoria. Most importantly, the fact that positive cognitions and negative life stress were jointly related to dysphoria (i.e., that the ability of either variable to predict dysphoria depended on the level of the other) supports the hypothesis that positive automatic cognitions moderate or "buffer" the impact of negative life events. Such support for the "buffer hypothesis," a heretofore unexplored logical corollary of the diathesis–stress hypothesis, has implications for the cognitive theory of depression (Beck, 1967).

As noted, according to the diathesis–stress hypothesis, vulnerability to depression occurs when dysfunctional beliefs or schemas are activated (i.e., interact with) schema-congruent negative life events. Thus, neither dysfunctional beliefs nor negative life events alone are sufficient to provoke depression—a joint or interactive relationship between the two is required.

In a parallel vein, findings of the present study suggest that persons who are able to generate positive thoughts about particular negative event outcomes may be able to ward off dysphoria. Indeed, positive thoughts may pertain to dysphoria and perhaps to depression primarily via their ability to attenuate the impact of negative life events. Such positive thoughts may arise in response to particular life stresses. Alternatively, a nonspecific general proclivity for positive thoughts may exist. Such a tendency to "think positive" may buffer the impact of a wide range of life stresses and may thereby "protect" the person not only from dysphoria but from anxiety and other psychological malaise.

Beck (1967) has hypothesized that negative attitudes about the self, world, and future confer vulnerability to depression. In a similar manner, the ability to generate positive thoughts about the self, world, or future in stressful situations may allow a person to see himself or herself positively, to "look on the bright side," and to maintain a relatively positive mood despite life stress. For example, persisting in positive thoughts about the future may allow a person to maintain hope despite negative occurrences, and thereby to ward off dysphoria or depression. It remains for forthcoming research to ascertain whether thoughts about oneself, the world, or the future, or other types of thoughts, are most relevant to such a buffering effect. Further examination of whether the "buffer" hypothesis remains credible in longitudinal studies and analogue studies also awaits future research.

How may results of the present study be reconciled with Kendall's suggestion (cited in Kendall, Howard, & Hays, 1989) that treatment gains may be associated less with increases in positive thinking than with decreases in negative thinking? Of course, such a rapprochement is unnecessary: Data of the present study are fully compatible with Kendall's

contention. Compared to positive thoughts, negative thoughts had a much stronger linear relationship with current dysphoria and, in regression analyses, accounted for a greater percentage of variance in dysphoria. Nevertheless, the Positive Thoughts × Negative Events interaction, but not the Negative Thoughts × Negative Events interaction, accounted for further incremental variance in depression. Negative thoughts, then, may be more directly salient to dysphoria (and to reductions in dysphoria), whereas positive thoughts may be related to dysphoria not only directly but via interactions with stressors. Future treatment studies may explore whether reduction in depression, especially stress-related depression, is associated not only with negative thoughts but with the Positive Thoughts × Negative Life Events relationship.

Supplemental regressions in the present study indicated that neither a "balance" score (specifically, the ratio of positive to positive + negative thoughts) nor a Balance Score × Negative Life Events interaction predicted unique variance in dysphoria over the variance accounted for by measures of positive and negative thoughts alone. Thus, balance score, which in the states of mind model (Schwartz & Garamoni, 1989) is considered pivotal in explaining emotional health and dysfunction, may contribute nothing to prediction or explanation beyond frequency of positive and negative thoughts. This conclusion is, however, tentative: as Kendall and his colleagues points out (Kendall et al., 1989), balance scores may be embedded in frequency scores. This, too, is a subject for future studies.

The results of this study should be viewed in light of design limitations. The correlational nature of the design did not permit detection of causality, nor did it allow for the evaluation of and selection between competing hypotheses. For example, an "absence of depression" or an elevated mood may "cause" the presence of positive cognitions, even in the presence of stressful life events. Alternatively, the significant ATQP × LES interaction term may indicate that negative life events moderate the impact of positive thoughts on depression, rather than indicating that positive thoughts moderate the impact of negative life events on depression.

Generalizability of results is further limited by the small, homogeneous sample and by the use of self-report instruments. These limitations call for circumspection in generalizing to other populations (such as clinically depressed patients) and to other methods of assessment. Replication and extensions of this study may utilize samples from other populations and alternative methods of assessing thoughts in order to empirically ascertain generalizability. It is also desirable to explore the relationship between positive thoughts and other variables such as optimism (Scheir & Carver, 1992), self-efficacy (Bandura, 1982), and social problem-solving (Nezu & Ronan, 1988), which also may function as stress buffers.

Despite these limitations, this study has provided intriguing evidence about the nature of the relationship between stress, positive cognitions, and dysphoria. The possibility that positive cognitions reduce the propensity for dysphoria and depression by buffering the effects of stress should be tested more rigorously in future longitudinal and analogue studies.

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