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# Can Positive Emotion Influence Problem-Solving Attitudes Among Suicidal Adults?

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A client's mood can hinder or enhance treatment and its effectiveness. Positive emotions can encourage exploration and experimentation, and they may have the long-term effect of resource building. The purpose of the present study was to assess this perspective as applied to the treatment of suicidal individuals. The authors found that patients prone to positive moods, as compared with those less prone to such moods, displayed more positive problem-solving attitudes following treatment for suicidal symptoms, and, partly as a function thereof, displayed enhanced treatment response. These findings suggest that clinicians may improve their chances of achieving successful treatment outcomes if they present skill-building treatments during windows of positive mood for the client, rather than in times of crisis.

Suicidality represents an interesting yet challenging area for clinical practitioners. For at least two reasons, the interconnections between suicidality, problem-solving, and mood appear to be clinically important. First, suicidality has been linked to problem-solving deficits (Schotte & Clum, 1982), and skill-based treatments appear to be effective in reducing suicidal behavior (Rudd, Joiner, & Rajab, 2000; Rudd et al., 1996). Second, although there is no question that people in suicidal crises experience predominantly negative moods, suicidal crises are time limited, and much of therapy is conducted once the crisis subsides, when patients' range of moods is broader. In the course of therapy with suicidal patients, then, positive moods may well occur, and according to the logic of the *broaden-and-build model* (Fredrickson, 1998), may represent windows of opportunity for problem-solving skill acquisition.

In her broaden-and-build model of positive emotions, Fredrickson (1998) proposed that emotions such as joy, interest, and contentment have the momentary effect of "broadening" cognition and behavior, so that exploration, experimentation, and play are more likely. Furthermore, because positive emotions subserve exploration and experimentation, they have the long-term effect of resource building. Through exploration and experimentation, new ideas and actions are discovered, building up an individual's repertoire of physical, intellectual, and social resources. The broaden-and-build model has accrued reasonable research support (Carnevale & Isen, 1986; Fredrickson, 1998; Isen, 1987; Isen, Daubman, & Nowicki, 1987; Kahn & Isen, 1993). Because of this research support, and because of the model's emphasis on the interconnections of mood and problem-solving skills, it deserves attention from clinicians interested in the interrelations of mood,

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mood disorders and their symptoms (including suicidality), and therapy-based skill acquisition.

The clinical implications of the broaden-and-build model are potentially numerous but have not been well delineated (for exceptions, see Fredrickson & Levenson, 1998, and Stone, Cox, Valdimarsdottir, & Jandorf, 1987, who showed that positive moods are linked to better cardiac and immune system functioning, respectively). Insofar as skill building is an integral part of several therapeutic approaches to mental disorders and insofar as many disorders involve mood dysregulation, clinicians' attention to the broaden-and-build model seems warranted. For example, according to the logic of the model, skill-related interventions timed to correspond with relatively positive moods may enhance outcomes. Similarly, patients who, despite their disorder, are relatively more prone than other patients to experience positive moods may more firmly and quickly acquire therapy-based skills and therefore achieve better outcomes. Patients who are relatively more prone than others to experience negative moods may need more time to acquire therapy-based skills.

The purpose of the present study was to conduct a test of this possibility among a large sample of participants referred to treatment for suicidal behavior or severe suicidal ideation. We tested the prediction that patients prone to positive moods, as compared with those less prone to positive moods, would show enhanced problem-solving attitudes (suggestive of cognitive broadening) following treatment for suicidal symptoms and would thereby display enhanced treatment response.

## Research Project on Problem-Solving Treatment for Suicidal Individuals

Participants for this study included 113 individuals (93 men; 20 women) who were evaluated at intake prior to entry into a larger study on treatment for suicidal young adults (Rudd et al., 1996) and who were available at 6-month follow-up. Results are also presented for participants who were available at 12-month follow-up ($n$ = 60). Participants were referred from two outpatient clinics, a 20-bed inpatient facility, and an emergency room, all affiliated with a major U.S. Army Medical Center. Mean age for the total sample was 22.32 ($SD$ = 2.72 years; range was 18—31). The gender distribution (82% men) is common in military medical settings. Most participants were Caucasian ($n$ = 73 or 64.6%);18.6% were African American; 12.4% were Hispanic; 1% were Native American; 1% were Asian or Pacific Islander; the remainder were classified as Other. As would be expected, mood and anxiety disorders were the most common diagnoses.

As is commonly the case in treatment studies, attrition from baseline to 6-month follow-up was substantial, owing to patients who decided not to pursue treatment, chose to drop out of the study, chose to drop out of the military, or underwent military reassignment. Participants who dropped out were not significantly different from participants who completed 6-month follow-up on any variable, except for problem-solving attitudes: Those who dropped out had poorer problem-solving attitude scores at baseline than those who returned, and this difference achieved statistical significance, $t(222) = 2.15$, $p < .05$. This finding is consistent with the view that those who most need treatment may be among the most likely to resist it (cf. "help negation"; Rudd, Joiner, & Rajab, 1995). Comparison of those who returned at 12-month follow up ($n$ = 60) with those not available at 12-month follow-up revealed no difference on any of the relevant variables.

Our main focus was on the interrelations between tendency toward positive affect, problem-solving attitudes, and suicidal symptoms. Participants were assessed at intake and at each follow-up using four different measures of these constructs. Regarding suicidality, a strength of our study was that both clinician-rated and self-report measures were used, and results converged across these two types of measures (cf. Eddins & Jobes, 1994; Jobes, Jacoby, Cimbolic, & Hustead, 1997; Joiner, Rudd, & Rajab, 1999). Testing and diagnostic interviews at intake and at follow-up were conducted by clinical staff (two licensed doctoral-level psychologists, three licensed master's-level professionals, and one advanced-level doctoral student) prior to entry into the treatment study. All staff were thoroughly trained and carefully monitored (see Rudd et al., 1996, for more information on procedures).

Problem-solving attitudes were assessed with the Problem-Solving Inventory (PSI, Form B; Heppner, 1988), a 32-item self-report measure. Higher scores correspond to more impaired problem solving. Previous work has demonstrated good reliability and adequate validity (Dixon, Heppner, Burnett, & Anderson, 1993; Heppner, 1988).

Suicidality, as mentioned above, was assessed with two separate measures. The first was the Modified Scale for Suicidal Ideation (MSSI; Miller, Norman, Bishop, & Dow 1986), an 18-item scale that is a modified version of Beck, Kovacs, and Weissman's (1979) Scale for Suicidal Ideation. It is a semi-structured interview, to be administered either by professionals or paraprofessionals. Items cover such topics as wish to die; intensity, frequency, and duration of suicidal ideation; suicide plans; and writing about suicide. Each MSSI item is rated on a 0–3 scale; overall scale scores thus may range from 0 to 54, with higher scores indicating more severe symptoms. Miller et al. (1986) have reported reliability coefficients (e.g., coefficient $\alpha$ = .94) and construct validity data (see also Clum & Yang, 1995; Joiner, Rudd, & Rajab, 1997).

The second measure of suicidality was the Suicide Probability Scale (SPS; Cull & Gill, 1989), a 36-item, self-report measure of suicidal and related symptoms. Scores are reported in terms of $T$ scores, with higher scores corresponding to more severe symptoms. The scale has accrued adequate reliability and validity data (e.g., Cull & Gill, 1989).

Positive affectivity was assessed using the Millon Clinical Multiaxial Inventory (MCMI; Millon, 1983). The original MCMI is a 175-item, true–false inventory designed for use with psychiatric patients. We focused on MCMI Scale 2 (Avoidant Symptoms) as a measure of the tendency to experience positive affect because the scale includes items that are exemplars of the positive affect construct, which is important in the present context. Scores are reported in terms of $T$ scores; lower scores on this measure correspond to higher positive affect.

Our use of MCMI Scale 2, as opposed to a purer measure of positive affect, was forced by the composition of the assessment battery for the larger suicide treatment project, which did not include such a purer measure. This is a limitation of the present

study. Accordingly, we must view our results as a preliminary test of the broaden-and-build model as applied to the resolution of suicidality, and we encourage future work geared toward replicating our findings with more precise measures of positive affect.

To buttress our use of MCMI Scale 2 as an index of positive affect, we conducted a separate study among a separate sample of 110 undergraduate students. Participants completed MCMI Scale 2 items and a well-established measure of positive affect: Watson and Clark's Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). MCMI Scale 2 items were significantly and negatively correlated with the positive affect (PA) portion of the PANAS, $r = -.63$, $p < .01$. The direction of this correlation was consistent with prediction. While further research using purer measures of PA are clearly needed, these findings provide at least some support for the notion that MCMI Scale 2 items together compose a workable measure of positive affect.

Means, standard deviations, and correlations among the four measures discussed above are presented in Table 1. Baseline means for suicidality were in (MSSI) or near (SPS) the clinical range, as would be expected. MSSI and SPS means were considerably lower at 6- and 12-month follow-ups, again as would be expected, given that all participants underwent treatment. Neither gender nor age was correlated with any of the variables listed in Table 1.

Following assessment at intake, and as part of the larger study (Rudd et al., 1996), all participants received rigorous treatment in one of two forms. The first type of treatment was a form of intensive, structured group therapy emphasizing interpersonal skill development and adaptive coping. Groups consisted of 8 to 14 members, and treatment took place for 9 hr/day over a period of 10 days. Each afternoon was spent focusing on six components of problem solving: problem orientation, problem identification and goal setting, generation of alternatives, evaluation of alternatives, implementation, and evaluation of initial efforts. This six-step approach to problem solving was consistent with that detailed by Nezu, Nezu, and Perri (1989). A second facet of treatment included eight 1-hr psychoeducational sessions taught in didactic format using detailed outlines of targeted issues (i.e., communication, impulsivity and anger control, emotion regulation, and stress management and relaxation). A third aspect was experiential–affective, involving discussion of connection between symptoms and past and current experiences and feelings.

The second type of treatment was referred to as "treatment as usual" and consisted of a combination of inpatient and outpatient services. Inpatient stays averaged approximately 7 days. Outpatient services typically combined antidepressant medication with individual therapy, group therapy, or both—with the specific nature of the treatment left up to the discretion of the provider. In neither case was treatment provided at follow-up, although participants were not restricted from obtaining treatment if needed. The larger treatment study addressed the question of differential effectiveness of these two types of treatment and found none (Rudd et al., 1996).

To test our conceptualization that positive affectivity (as indexed by MCMI Scale 2) would predict enhanced problem-solving attitudes (as indexed by PSI), and thus facilitate resolution of suicidal symptoms (as assessed by SPS [reported] and MSSI [not

Table 1
*Means (and Standard Deviations) of, and Intercorrelations Between, All Variables*

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. MCMI Scale 2 | 57.65 (29.85) | — | | | | | | | | |
| 2. SPS at baseline | .48* | 66.10 (9.15) | — | | | | | | | |
| 3. SPS at 6 months | .40* | .45* | 57.50 (10.95) | — | | | | | | |
| 4. SPS at 12 months | .49* | .19 | .67* | 56.06 (12.43) | — | | | | | |
| 5. MSSI at baseline | .22* | .57* | .36* | .16 | 21.88 (10.15) | — | | | | |
| 6. MSSI at 6 months | .14 | .17 | .48* | .32* | .15 | 4.15 (9.19) | — | | | |
| 7. MSSI at 12 months | .21 | .17 | .18 | .42* | .23 | .21 | 1.74 (5.78) | — | | |
| 8. PSI at baseline | .26* | .59* | .23* | .06 | .49* | .10 | .14 | 104.31 (25.06) | — | |
| 9. PSI at 6 months | .29* | .40* | .52* | .39* | .41* | .31* | .10 | .52* | 91.60 (23.01) | — |
| 10. PSI at 12 months | .53* | .34* | .42* | .49* | .24 | .01 | .04 | .32* | .44* | 88.13 (27.56) |

*Note.* For correlations between baseline and 6-month variables, $N = 113$; for correlations between 12-month and all other variables, $n = 60$. MCMI Scale 2 is used here to assess tendency toward positive affect. MCMI = Millon Clinical Multiaxial Inventory; SPS = Suicide Probability Scale; MSSI = Modified Scale for Suicidal Ideation; PSI = Problem-Solving Inventory.
* $p < .05$.

reported]), we conducted two pairs of regression equations.[1] The first equations sought to demonstrate that problem-solving attitudes improved more for patients high in positive affectivity than for other patients and were as follows (separate equations for the 6- and 12-month follow-ups): Follow-up problem-solving scores (PSI) were the dependent variables, baseline PSI scores were inserted first into the equation, and MCMI Scale 2 scores were inserted last. If problem-solving attitudes improved more for patients high in positive affectivity than for other patients, MCMI Scale 2 scores should significantly predict PSI changes (Cohen & Cohen, 1983). This was, in fact, the case at 6-month follow-up, $pr = .19$, $t(110) = 2.04$, $p < .05$, and 12-month follow-up, $pr = .48$, $t(57) = 4.14$, $p < .05$. Therefore, while all patients improved regarding problem-solving attitudes from baseline to follow-up (see Table 1), those high in positive affectivity tended to improve more than other patients.

Second, we constructed similar regression equations to evaluate whether suicidal symptoms improved more for patients high in positive affectivity than for other patients. If suicidal symptoms improved more for patients high in positive affectivity than for other patients, MCMI Scale 2 scores would significantly predict SPS changes. This was, in fact, the case at 6-month follow-up, $pr = .24$, $t(110) = 2.54$, $p < .05$, and 12-month follow-up, $pr = .47$, $t(57) = 4.15$, $p < .05$. Again, while all patients experienced symptom improvement (see Table 1), those high in positive affectivity tended to improve more than other patients regarding suicidal symptoms.

A key prediction in the present context is that those high in positive affectivity (and thus open to cognitive broadening) will accrue problem-solving attitude gains and as a function thereof experience fewer suicidal symptoms. This is a *mediational claim* (i.e., changes in problem-solving account for, or mediate, changes in symptoms). The most important step in demonstrating that changes in problem-solving attitudes mediated the relationship between positive affectivity and symptom improvement is to show that this relationship is reduced when problem-solving attitude changes are accounted for.

We constructed regression equations as follows (separate equations for 6- and 12-month follow-ups): Follow-up suicidal symptom scores (SPS) were the dependent variables, baseline SPS scores were inserted first into the equation, baseline and follow-up problem-solving attitude scores (PSI) were inserted into the equation next, and MCMI Scale 2 scores (used to index positive affectivity) were inserted into the equation last.[2] Consistent with the view that those high in positive affectivity experience fewer suicidal symptoms partly as a function of gains in problem-solving attitudes (indicative of cognitive broadening), the relation of positive affectivity to suicidal symptom changes at 6 months was no longer significant when changes in problem-solving attitudes were controlled, $pr = .17$, $t(108) = 1.91$, *ns*. Similarly, the relation of positive affectivity to suicidal symptom changes at 12 months was reduced when changes in problem-solving attitudes were controlled, $pr = .29$, $t(55) = 2.32$, $p < .05$.

The regression results, considered together, are consistent with the view, based on Fredrickson's (1998) broaden-and-build model, that those high in positive affectivity will accrue enhanced problem-solving attitudes and partly as a function thereof experience fewer suicidal symptoms.

Finally, we examined other MCMI basic personality scales to evaluate whether they displayed this same pattern of results (i.e., predicted symptom remission as a function of improvement in problem-solving attitudes). If other MCMI scales followed the same pattern, it could indicate that improved treatment response was attributable to good personality functioning in general, rather than positive affect specifically. We found that with the exception of Scale 2, our index of positive affectivity, no MCMI scale predicted treatment response as a function of predicting problem-solving attitudes. Consistent with Fredrickson's (1998) model, broadening and building thus was relatively specific to positive affectivity, rather than indiscriminately applicable to good personality functioning in general. Collectively, these results conformed to expectations. Patients who tended toward positive moods tended to experience enhanced symptom remission as well as improved problem-solving attitudes; it is important to note that improved problem-solving attitudes partly mediated symptom remission, consistent with a broaden-and-build process.

There are some potential limitations to this study that must be considered. Because of our forced use of MCMI Scale 2 as a measure of positive affectivity, one may assert that our findings merely capitalize on a well-known finding that Scale 2 is a predictor of good treatment response. However, for two reasons, we believe this is not the case. First, even if Scale 2 does predict treatment response, its doing so as a function of improved problem-solving has not been previously examined, whereas this was a main focus of our study. Second, it is not at all clear that Scale 2 invariably is a predictor of treatment response. For example, Elliott, Jackson, Layfield, and Kendall (1996) reported that Scale 2 was predictive of clinician- but not patient-rated response to treatment for chronic pain. Mixed findings have also been reported regarding other clinical problems (e.g., posttraumatic stress disorder; Munley, Bains, Frazee, & Schwarz, 1994; panic disorder; Rathus, Sanderson, Miller, & Wetzler, 1995).

In addition, we note that results were obtained within the context of a large-scale suicide treatment project in a military environment—not necessarily representative of the usual mental health setting (e.g., gender ratio was 4.6 men to 1 woman). Also, attrition was considerable, and although patients who stayed and those who dropped out were similar on the majority of study variables, they were not similar on problem solving, and this issue should be considered in interpreting our findings. Caution should be exercised in generalizing to other clinical settings and populations. By the same token, the study is fairly representative of the naturalistic situation, in which a suicidal person in crisis elicits some form of professional intervention (if only temporarily). Moreover, an advantage of the sample was the substantial representation of participants experiencing severe psychiatric symptoms. The structure of

[1] We focus on the SPS for sake of brevity and because Joiner, Rudd, & Rahab (1999) found some evidence that self-report measures of suicidality (SPS) may possess probative value not possessed by clinician-rated suicide measures (MSSI). It is emphasized that results in the present study were similar regardless of whether MSSI or SPS was used.

[2] Because we predicted that changes in problem-solving attitudes would serve as mediators, both the baseline and follow-up PSI measures were included in the mediational regression analysis (similar to the approach of Joiner, Katz, & Lew, 1999).

the research project, although perhaps not completely representative of the usual situation, nonetheless provided at least preliminary insight regarding the applicability of the broaden-and-build model to treatment of suicidal individuals.

## Implications and Applications

Consider a typical clinical situation. A patient in distress has presented for treatment and is bombarded by his or her clinician with information regarding the nature of the diagnosed disorder (and its consequences), treatment (and its potential consequences), issues of informed consent and confidentiality, number, nature, and frequency of treatment sessions, accessibility of the therapist between sessions, prognosis, adjunctive therapies, and so forth. This is a lot of information for someone to absorb, particularly when distressed.

For a suicidal patient in crisis, it could be uniquely overwhelming. According to the logic of Fredrickson's (1998) broaden and build model, patients at this stage may not be suited to exploring, experimenting with, and adopting new life skills because they are overwhelmed with negative emotion. Rather, patients in crisis may benefit from simple crisis resolution techniques, such as ensuring safety and marshalling social support to help solve a specific crisis-related problem (see Rudd et al., 2000, pp. 152–153). However, crises are time limited, and once they are diffused, our study suggests that disposition toward a positive mood may enable the cognitive broadening necessary to allow for long-term skill acquisition. We therefore suggest that didactic aspects of treatment, as well as any aspect focused on learning such new skills and thinking styles (Linehan, Armstrong, Suarez, Allmon, & Heard, 1991; Rudd et al., 2000), may be most useful if timed to correspond with relatively positive moods. For suicidal patients, positive moods most likely will not spontaneously occur until after the immediate crisis is past. However, as treatment progresses, it is very likely that patients will naturally experience moments of positive moods. Our results suggest that clinicians may wish to accelerate or intensify techniques geared toward skill building during these times of positive emotions.

In addition, such moods might be induced through a variety of straightforward therapeutic exercises and techniques, some of which are well known. For example, Lewinsohn and colleagues (e.g., Zeiss, Lewinsohn, & Munoz, 1979) have documented that a cognitive and behavioral focus on scheduling and engaging in pleasant activities (e.g., listening to favorite music, reading favorite books, talking with supportive friends, going to favorite restaurants, taking walks, playing with pets, and engaging in favorite hobbies and pastimes) has clear mood-enhancement effects. Scheduling pleasant activities therefore is likely to have beneficial effects in its own right (i.e., mood enhancement) but may also have beneficial effects from mood-facilitated skill building.

Another straightforward example is to ask patients to dwell on their "best of times" (i.e., times in their lives when they were delighted, joyful, proud, and so forth) or to engage them in other similar visualization activities. Such exercises, similar to scheduling pleasant activities, may produce mood benefits (important in themselves) and thereby facilitate absorption of new therapy-based skills (important as well). Incidentally, a clear understanding of patients' "best of times" carries an additional benefit, in that it gives clinicians a sense of patients' best level of functioning. This, in turn, is useful in setting treatment goals (i.e., return to level of functioning attained during a patient's "best of times"), and, of course, setting clear, functioning-related treatment goals is often important in managed care settings. Whether spontaneous or induced, moderately elevated mood states could then facilitate the cognitive broadening that allows patients to subsequently explore and adopt new skills, increasing the likelihood of successful treatment outcome.

Of course, for patients with pervasive dysphoria, there may be few naturally occurring windows of positive mood, and induction of such moods may prove more difficult. For such patients, it is not our view that therapists should save interventions for the rare occasions of relatively positive mood; rather, we suggest that such patients may require more time to benefit from skill-based therapies and may particularly benefit from "booster" or maintenance sessions following symptom remission. Such patients may also benefit from techniques geared toward in-session diminution of distress. For example, as we have described elsewhere (Rudd et al., 2000), such techniques as a "symptom matching hierarchy" and development of a "crisis card" often take the edge off of intense negative moods, thereby possibly allowing more positive moods to emerge.

The symptom matching hierarchy simply involves a listing of disruptive symptoms and feelings as well as the patient's ranking of these in terms of which are most upsetting (e.g., as rated on a 1–10 scale). For the top two or three symptoms or feelings, very concrete recommendations are made (e.g., sleep hygiene for insomnia; relaxation for general emotional distress; pleasant activities for depressive symptoms). The crisis card simply involves the development of a straightforward crisis plan that can be written down on the back of a business card, a 3 × 5 index card, or a sheet of paper. An example statement on the crisis card would be "When I'm upset and thinking of suicide, I'll take the following steps: (1) use what I've learned in therapy to try to identify what is upsetting me; (2) write down and review some reasonable, nonsuicidal responses to what is bothering me; (3) try to do things that, in the past, have made me feel better (e.g., music, exercise, etc.); (4) if the suicidal thoughts continue and get specific, or I find myself preparing for suicide, I'll call the emergency call person at xxx-xxxx [phone number]; (5) if I feel that I cannot control my suicidal behavior, I'll go to the emergency room or call 911." Both the symptom matching hierarchy and the in-session development of a crisis card may dilute intense distress then and there in the session, possibly allowing for the emergence of more positive moods.

In summary, we applied the broaden-and-build model of positive emotion and problem-solving to the acquisition of good problem-solving attitudes among suicidal adults. Results were consistent with the view that patients who tended toward positive moods tended to experience enhanced symptom remission and that they did so partly as a function of improved problem-solving attitudes. Clinicians who are aware of these concepts and findings may be better positioned to efficiently plan, manage, and tailor skill-based treatments for patients with various mood profiles.

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