Psychometric Properties of the Positive
Automatic Thoughts Questionnaire

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The Positive Automatic Thoughts Questionnaire (ATQ–P) was designed to assess the frequency of positive self-statements. This article reports original data and reviews other studies that have used the ATQ–P. These data show that the reliability and the norms of the ATQ–P appear stable and that the ATQ–P is inversely associated with negative affective states but unrelated to conditions such as medical condition not accompanied by psychological distress. The ATQ–P also shows adequate convergent and discriminate validity. Data also show that the ATQ–P conforms to theoretical predictions of the states-of-mind model. Finally, these data show that the ATQ–P is sensitive to cognitive changes. In sum, the results suggest that the ATQ–P is an effective measure of positive self-statement frequency.

A central construct in several theories of psychopathology is automatic thinking. Beck (1967, 1976), for instance, has argued that repetitive, intrusive, and relatively uncontrollable negative self-relevant thoughts play a critical role in precipitating psychopathological states. With regard to depression, Haaga, Dyck, and Ernst (1991) have underscored that this theoretical position emphasizes the automaticity of negative cognitions in the disorder. Similar perspectives on the automatic nature of negative cognition in psychological disorders have been offered by other theorists (Ingram, 1984, 1990; Kendall & Ingram, 1987; Nolen-Hoeksema, 1987; Teasdale, 1983, 1988). ¹

A variety of psychometric methods have been developed to assess the extent and quality of automatic negative cognitions. One of the most useful measures of the frequency of negative self-relevant cognitions is the Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980). The ATQ asks respondents to rate the frequency of occurrence of 30 negative self-statements during the past week. Development of the ATQ has facilitated progress in evaluating both the negative cognitions associated with psychopathology and the function of cognitive change mechanisms (see Bisno, Thompson, Breckenridge, & Gallagher, 1985; Dobson & Breiter, 1983; Hollon & Kendall, 1980; Hollon, Kendall, & Lumry, 1986; Ingram, Kendall, Smith, Donnell, & Ronan, 1987).

¹ There are numerous levels of reference for terms such as negative cognition (e.g., negative thinking, negative self-statements, dysfunctional thinking). In this article, unless otherwise noted, we use the term cognition to refer to self-referent cognitions and the terms negative and positive to refer to self-referent cognitions that are respectively negative or positively valanced. Similarly, unless otherwise noted, negative (or positive) cognition is construed as operating automatically. It should be mentioned in this vein that, as several writers have pointed out (Haaga, Dyck, & Ernst, 1991; Ingram, 1984), psychopathology theorists, most notably depression theorists, conceptualize the construct of automatic cognition somewhat differently than do theorists such as Shiffrin and Schneider (1977). These theorists characterize automatic cognition as the activation of elements in long-term memory that are initiated without awareness and place limited demands on available cognitive capacity. To be considered automatic, however, models of psychopathology do not require that cognition be initiated without awareness or that the cognition not take available processing capacity. Rather, cognition is considered automatic to the extent that once initiated, through conscious means or not, the cognitive processes proceed without conscious effort.

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Although measures such as the ATQ play an important role in examining negative cognition, the importance of assessing positive cognitive variables is gradually becoming recognized. Several investigators have suggested that deficits in positive cognition may constitute an aspect of emotional disorders that is as important as excessive negative cognition (Kuiper & Derry, 1982; Heimberg, Acerra, & Holstein, 1985; Ingram, Smith, & Brehm, 1983). Other researchers have postulated that a specific relationship between positive and negative cognition may be a key determinant of psychopathology (Kendall, 1984; Kendall & Hollon, 1981; Schwartz, 1986; Schwartz & Garamoni, 1989; Schwartz & Michelson, 1987).

As investigators have begun to recognize the potential importance of assessing positive cognitions, several measures of this construct have been devised. A revision of the original ATQ, for example, has been reported by Kendall, Howard, and Hayes (1989; ATQ–R). The ATQ–R includes 10 positive self-statements in addition to the 30 negative self-statements that appear on the ATQ. In another attempt to facilitate the evaluation of positive cognition, Ingram and Wisnicki (1988) developed the Positive Automatic Thoughts Questionnaire (ATQ–P) to assess the frequency of positive self-statements or thoughts.

The focus of this article is on the ATQ–P. The ATQ–P was devised specifically as a positive counterpart to the ATQ. Although the original Automatic Thoughts Questionnaire, which contains only negative items (referred to hereinafter as the ATQ–N), and the ATQ–P share the same format, the ATQ–P asks individuals to rate the occurrence over the last week of 30 positive self-relevant cognitions. Respondents are told that they will read a list of 30 self-statements that sometimes "pop into people's heads" and to rate how frequently these or similar thoughts have automatically occurred to them during the last week. Respondents are also cautioned to rate how frequently the thoughts occurred rather than whether they believe the thoughts. Responses are rated from 1 (never) to 5 (all the time), yielding a possible range of scores from 30 to 150. A complete description of the items can be found in the study by Ingram and Wisnicki (1988).

Although the initial data on the adequacy of the ATQ–P are promising (Ingram, Slater, Atkinson, & Scott, 1990; Ingram & Wisnicki, 1988), several questions remain about the measure. This article reports extensive data on the ATQ–P that specifically address a number of psychometric issues relevant to the reliability and validity of the measure as an index of positive cognition. For several of these issues, original data have been collected and are reported here. In other cases, data are examined from previously published studies. In some of these studies the ATQ–P data were reported, whereas in other studies ATQ–P data were collected but not reported. Finally, data using the ATQ–P from several unpublished studies are also reported.

The results presented here are organized around several specific psychometric topics. First, replication of the ATQ–P norms is presented, followed by data on the reliability of the measure and data on social desirability. Next, we present results measuring the construct validity of the ATQ–P, specifically data on the discrimination of psychopathological states and then additional data on convergent and discriminant validity. Finally, data on the sensitivity of the ATQ–P to reflect shifts in levels of positive cognition are presented.

Replication of Norms

Ingram and Wisnicki (1988) reported a mean ATQ–P score of 103.31 in their original sample. Studies that have subsequently reported mean data for similar participant groups are presented in Table 1. The samples in the first column are characterized by a low degree of psychological distress. All of these means fall within a standard deviation of the original norming group, and in fact, the average ATQ–P mean across these studies of 101.53 is quite similar to the norms reported by Ingram and Wisnicki (1988).

Several studies have examined possible gender differences in ATQ–P scores (e.g., Ingram, Atkinson, Slater, Saccuzzo, & Garfin, 1990; Ingram, Slater, et al., 1990, Ingram & Wisnicki, 1988). In no case were any gender differences found.

Reliability Data

In evaluating the reliability of the ATQ–P, Burgess and Haaga (1994) found a coefficient alpha of .95 for the measure and also reported that correlations between each item and the total scale ranged from .37 to .77. Using odd and even items to assess internal reliability, Baldree, Ingram, and Saccuzzo (1991) found a split-half reliability of .92 and a coefficient alpha of .95. They found that the correlations of items to the total scale, removing the assessed item, ranged from .32 to .78. Test–retest reliability was also determined by administering the ATQ–P on two different occasions, 1 month apart. A correlation of .80 was found between scores at these different administrations.

Data relevant to the reliability of the ATQ–P were collected as part of a larger project reported by Ingram, Johnson, Bernet, Dombeck, and Rowe (1992). Undergraduates (32 men and 32 women) varying on the Beck Depression Inventory (BDI; Beck, 1967) and the Private Self-Consciousness subscale of the Self-Consciousness Scale (Fenigstein, Scheier, & Buss, 1975) were assessed weekly over a 10-week period. From the ATQ–P scores at Week 1, the magnitude of correlations ranged from \( r(51) = .82, p < .001 \), at Week 2, to \( r(54) = .73, p < .001 \), at Week 10. * Coefficients are illustrated in Figure 1.

Data collected over a 10-week period allow several ways to examine reliability. For example, it is possible to examine temporal stabilities over different time periods. Figure 1 illustrates the average weekly temporal stabilities over 1 through 9 weeks.

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2 It is not possible to include all positive (or negative) thoughts that might occur to an individual. Thus, like the ATQ–N and the ATQ–R, the ATQ–P is intended to provide a generic index of the degree of occurrence of automatic cognitions. That is, the interest in these particular self-statements is limited. Rather, they are intended to sample a range of positive thoughts and thus provide a way to generally assess the occurrence (or deficits in the occurrence) of overall positive thinking. This is why instructions for these measures ask respondents to rate these or similar thoughts.

3 Data from these studies will be reviewed as they pertain to given psychometric issues as they are raised in this article.

4 Degrees of freedom vary slightly because of occasional missing data.
Table 1
ATQ–P Means and States-of-Mind (SOM) Ratios for Various Samples

<table>
<thead>
<tr>
<th>Study</th>
<th>Nondistressed M</th>
<th>Subclinical M</th>
<th>Clinical M</th>
<th>Nondistressed SE</th>
<th>Subclinical SE</th>
<th>Clinical SE</th>
<th>Nondistressed N</th>
<th>Subclinical N</th>
<th>Clinical N</th>
<th>Nondistressed SOM</th>
<th>Subclinical SOM</th>
<th>Clinical SOM</th>
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<tr>
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<td>24</td>
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<td>.39</td>
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<tr>
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<td>81.41</td>
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<td>16</td>
<td>12</td>
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<td></td>
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<td>17</td>
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<td>.56</td>
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<tr>
<td>London (1989)</td>
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<td>.67</td>
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<td>.56</td>
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<td>Ingram, Slater, et al. (1990)</td>
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<td>.</td>
<td>7.85</td>
<td>3.43</td>
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<td>.62</td>
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<tr>
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<td>36</td>
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<td></td>
<td>99.30</td>
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<td>1.77</td>
<td></td>
<td></td>
<td>165</td>
<td></td>
<td></td>
<td>.67</td>
<td>.51</td>
<td>.56</td>
</tr>
</tbody>
</table>

Note: ATQ–P = Positive Automatic Thoughts Questionnaire. Noted are any groups not composed of only control participants, only participants who scored high on depression measures (subclinical), or only participants diagnosed as having major depression. *Socially anxious only. **Depressed, not socially anxious. *Mixed depressed and socially anxious. #Mixed depressed and generalized anxiety. *Subclinically depressed pain patients. *Clinically depressed pain patients. *Nondepressed pain patients. *Dysphoric osteoarthritis patients. *Patients who had experienced a depressive episode in the past.

(e.g., 1-week stability refers to the average reliabilities for 1–2, 2–3, etc.; 5-week stability consists of the average weekly reliabilities for Weeks 1–6, 2–7, etc., and so on). As can be seen from Figure 1, mean reliabilities start at .91 for 1 week and average .73 over 9 weeks.

As previously noted, participants in the Ingram et al. (1992) study were selected for varying levels of depressive affect and private self-consciousness. These various combinations allow for a determination of whether the temporal stability of the measure varies according to different participant samples. The correlation between Week 1 and Week 10 ATQ–P scores for nondistressed participants was $r(29) = .72, p < .001$, and for subclinically distressed participants was $r(25) = .74, p < .001$. Private self-consciousness did not appear to affect these reliability estimates. For example, the correlation coefficients for Weeks 1 to 10 were elevated both for participants high (.77) and not high (.73) in private self-consciousness.

The studies reviewed thus far indicate satisfactory levels of internal consistency for the ATQ–P. It is important to note, however, that obtained temporal stability coefficients may partially reflect memory effects. That is, reliability assessed by repeated administrations of the same test can be affected by factors such as participants' memory for how they had answered items in previous administrations and the possible desire to give consistent responses across different administrations.

Social Desirability Influences

A social desirability response set among respondents is a factor that may influence obtained scores on the ATQ–P. Data on this issue can be gleaned from several sources. For instance, Balderree et al. (1991) investigated the relationship between the ATQ–P and social desirability in an undergraduate sample using the Marlowe-Crowne Social Desirability Scale (SDS; Crowne & Marlowe, 1964). The SDS is a widely used measure of social desirability responding. Correlational analyses indicated little common variance ($r = .16$; less than 3% variance accounted for). Further analyses computed between each ATQ–P item and the SDS showed that only six ATQ–P items correlated significantly with the SDS. Removal of these items reduced the correlation between the ATQ–P and the SDS from .16 to .14.
In another study, Bruch, Mattia, Heimberg, and Holt (1993) presented data on the relationship between the ATQ–P and social desirability similar to those reported by Baldree et al. (1991). The measures used in the Bruch et al. (1993) study were identical to those reported by Baldree et al. (1991), although a fundamental aim of the study by Bruch and colleagues was to assess positive automatic thinking in four separate affective groups (depressed, socially anxious, depressed and socially anxious, and control participants). Bruch et al. (1993) found an overall correlation of .20 between the ATQ–P and the SDS. Although this correlation was statistically reliable, its magnitude is quite similar to that reported by Baldree et al. (1991) and accounts for only 4% of the variance.

Data on the relationship between the ATQ–P and the Minnesota Multiphasic Personality Inventory (Hathaway & McKinley, 1967; MMPI) will be reported in a subsequent section. Some of the MMPI scales, however, are relevant to the issue of social desirability. Specifically, the MMPI contains two validity scales, L and K, that are suggestive of a tendency toward socially desirable responding. As can be found in Table 2, the ATQ–P and the MMPI L and K scales are correlated .22 and .19, respectively. Although statistically significant, these data indicate that little more than 4% of the variance in ATQ–P scores is shared with social desirability. Results of these studies therefore provide little evidence to suggest ATQ–P responses are substantially biased by social desirability factors.

**Construct Validity**

There are a number of ways to evaluate the construct validity of the ATQ–P. Based on conceptual models of psychopathology (Beck, 1967; Ingram, 1984; Teasdale, 1988), for example, scores on the ATQ–P should be inversely related to measures of affective syndromes and correspondingly should be able to discriminate between psychologically distressed and nondistressed states. In addition, to the extent that the ATQ–P is a valid measure of positive cognition, scores on the instrument should correspond to theoretical predictions from models that specify the relationship between positive cognition and other variables. In particular, the states-of-mind model (Schwartz & Garamoni, 1989) specifies precise relationships between negative and positive thinking in various psychopathological states. Validity of the ATQ–P is supported to the degree that results using this measure, in conjunction with ATQ–N results, parallel these predictions.

Although it is important to demonstrate that the measure is inversely related to indexes of negative affective states, there is little reason to believe that lower levels of positive cognition should only be observed in some states of psychological dysfunction and not others (Ingram & Wisnichki, 1988); hence the ATQ–P should not be specific to only some kinds of psychological dysfunction and not others (Ingram & Wisnichki, 1988); hence the ATQ–P should not be specific to only some kinds of psychological distress. However, the measure should be specific.
<table>
<thead>
<tr>
<th>Study</th>
<th>Overall</th>
<th>Sample</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Nondistressed</td>
</tr>
<tr>
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</tr>
<tr>
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<td></td>
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<tr>
<td>Ingram (1989b)</td>
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<tr>
<td>London (1989)</td>
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<td></td>
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<tr>
<td>McDermut &amp; Haaga (1994)</td>
<td>-.46</td>
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</tbody>
</table>

Note. ATQ-P = Positive Automatic Thoughts Questionnaire; ATQ-N = Negative Automatic Thoughts Questionnaire.
* Each of these studies included data from two nondistressed samples.

Association With Affective Symptomatology

Ingram and Wisniki (1988) originally reported several correlations between the ATQ-P and measures of negative affective states such as depressive symptomatology (i.e., a correlation of -.33 between the ATQ-P and the BDI). Burgess and Haaga (1994) found an association of -.47 between the ATQ-P and the Beck Depression Inventory (BDI; Beck, 1967), whereas Baldree et al. (1991) found a correlation of -.45 between these measures. Thus, the ATQ-P inversely correlates reliably with measures of depressive symptoms.

Differentiation of Distress From Nondistress

An important test of the ATQ-P is its ability to discriminate between psychopathological and nonpsychopathological states; many psychopathological states should be characterized by lowered levels of positive cognition. A number of studies have collected data that are relevant to this question (i.e., Bruch et al., 1993; Burgess & Haaga, 1994; Ingram, 1989a, 1989b; Ingram, Atkinson, et al., 1990; Ingram, Bernet, & McLaughlin, 1994; Ingram, Fidaleo, Friedberg, Shenk, & Bernet, 1995; Ingram, Slater, et al., 1990; Ingram & Wisniki, 1988; London, 1989; McDermut & Haaga, 1994). Data from these studies are summarized in Table 1. Entries are divided into mild or subclinical states (e.g., an elevated score on a measure of depression or anxiety) and clinical states (e.g., a diagnosis of depression). As can be seen, in each case the ATQ-P is lower for subclinical participants than for control participants. Indeed, the difference between ATQ-P scores for the nondistressed and subclinical distressed groups can be shown to be statistically reliable by a meta-analytic combination of effect sizes based on differences between group means for each of the summarized studies. The average effect size, weighted by the inverse of the sample variance, was a statistically significant 2.561, Z = 27.47, p < .05. This effect size suggests a true difference between the groups' scores.

The average effect size for the difference between nondistressed and clinically distressed groups was 1.828, which was significant, Z = 8.10, p < .05. (Because of the few studies with ATQ-P means for both subclinical and clinically distressed groups, these differences could not be tested.) Thus, although there are considerably fewer data available for individuals diagnosed with a clinical disorder, the available data are generally consistent with the expectation that these individuals show the lowest ATQ-P scores. The only exception to this finding appears in the study reported by Ingram, Slater, et al. (1990). These participants were medical patients with back pain who were also diagnosed with a major depressive disorder; their ATQ-P scores, however, were comparable to those found in subclinical samples. Even though these patients were diagnosed with major depression, the results may be attributable to the severity of their depression; participants were outpatients with a mean BDI score of 22.92 (ATQ-P, M = 81.41), whereas the other two clinical samples reported in Table 1 were inpatients with mean BDI scores of 31.33 (ATQ-P, M = 64.53) and 34.46 (ATQ-P, M = 42.00).

Conformity to Theoretical Predictions: The States-of-Mind Model

Another way to assess the construct validity of a measure is to examine the extent to which it fits the predictions of a given
model. The states-of-mind (SOM) model (Schwartz & Garamoni, 1989) specifies fairly precise ratios of positive and negative thinking that should occur at various levels of psychopathology. Schwartz and Garamoni (1989) have reviewed an impressive amount of literature that suggests that these ratios do in fact occur over a range of not only differing severities of dysfunction but also over a range of different kinds of dysfunction. Because the ATQ-P is intended to sample a range of positive thoughts, an important test of the ATQ-P is the extent to which data derived from it, in conjunction with the ATQ-N, conform to the ratios specifically predicted by the SOM model.

The SOM model predicts that the relationship between positive and negative thinking is most appropriately examined by calculating the ratio of positive thoughts to the sum of positive and negative thoughts. Using this relationship, and using a substantial array of evidence from diverse sources, Schwartz and Garamoni (1989) argued that different ratios should occur across different levels of functioning. They suggested that optimal functioning is characterized by a ratio of .62 ± .06, for a range of .56 to .68. They refer to this balance as a “positive internal dialogue.” Mildly negative psychopathological states are referred to as an “internal dialogue of conflict” and should evidence a ratio of .50 ± .06 for a range of .44 to .56. Finally, severe psychopathology is characterized by a ratio of .38 ± .06 for the range of .32 to .44, referred to as the “negative internal monologue.”

SOM ratios were calculated from studies in which scores from both the ATQ-P and the ATQ-N were reported. Combined ATQ-P and ATQ-N scores for each group are presented graphically in Figure 2, whereas SOM ratios are presented in Table 1. A high degree of correspondence between ratios calculated with the ATQ-P and predictions made by the SOM model can be seen. For nondistressed individuals, the studies show a ratio within the predicted range, with the exception of the means for the nondistressed samples in the studies by Ingram, Slater, et al. (1990) and Callas (1990) that were in the correct direction but just slightly above the predicted ratio (.71 and .70, respectively).

Subclinical groups in these studies include participants with elevated scores on measures of depression, social anxiety (e.g., Bruch et al., 1993; Ingram, 1989a, 1989b), and generalized anxiety (London, 1989). All of the subclinical groups fell within the predicted range, with the exception of participants who were uniquely high in social anxiety (i.e., those who were selected for elevated levels of social anxiety but whose depression scores were within the normal range).

Two of the clinically depressed groups fell within the predicted range, whereas one clinical group was closer to the range predicted for subclinical states. As previously noted, although this group was diagnosed with depression, the severity level was considerably milder than for the remaining two clinical groups. Additionally, one subclinical group fell in the range predicted for more severe psychopathology. Bruch et al. (1993) have noted that, although this mixed group comprising dysphoria and socially anxious participants was not administered any diagnostic interview, its members were selected for being at the upper end of what is usually considered dysphoric (e.g., Kendall, Hollon, Beck, Hammen, & Ingram, 1987) and may thus reflect more severe levels of psychopathology. The overall pattern for nondistressed, subclinically distressed, and clinical depressed participants then is generally quite consistent with predictions derived from the SOM model.

Specificity of the ATQ-P

It is important to assess the degree to which the measure is specific to only some kinds of psychological distress, such as depression, or is characteristic of a broader range of negative emotional states. Additionally, it is important to determine whether the measure specifically taps the correlates of psychological distress or is instead also sensitive to conditions that are not accompanied by psychological distress.

Affective syndrome specificity. In addition to the BDI, Ingram and Wissicki (1988) also administered measures of trait anxiety (the trait form of the State-Trait Anxiety Inventory; STAI; Spielberger, Gorsuch, & Lushene, 1970) and social anxiety (the Social Avoidance and Distress Scale; SADS; Watson & Friend, 1969). They found that ATQ-P scores were inversely related to scores on the BDI (r = -.33), the STAI (r = -.37), and the SADS (r = -.32). Given the relatively high correlations between various measures of negative affect (e.g., .54 between trait anxiety and depression in the sample), however, the unique relationship between the ATQ-P and each of these measures is unclear.

To further assess the issue of specificity to depressive symptomatology, data from the original Ingram and Wissicki (1988) study were reanalyzed for this report. Although it is possible to statistically control for various kinds of affect by partialing out other affective measures from the measure of interest, it is preferable to methodologically control for confounded affect (Ingram, 1989b) by recomputing correlation coefficients after participants scoring above the mean on a correlated measure are removed from the analysis. This allows analysis of individuals of interest (i.e., those who are uniquely high in one state or the other). With enough participants (469 in this case) this still provides an adequate range of scores for each measure. Hence, for example, although some high-depression participants will also be removed when high-anxiety participants are removed (and vice versa), a sufficient number of participants with high depression scores will remain for the analysis and will constitute a group of people who are uniquely high in a particular affective state.

The sample consisted of 469 undergraduates who completed the ATQ-P, the ATQ-N, the BDI, the STAI, and the SADS. In the first analysis, computed using the BDI, participants who scored above the sample mean on the STAI (M = 38) were excluded, thus ensuring that participants remaining in the sample were not high in trait anxiety. The resulting correlation, r(261) = -.31, p < .001, was virtually unchanged from the original correlation between the ATQ-P and the BDI (r = -.33). A correlation with the STAI was then calculated excluding participants

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3 Semipartial correlations showed similar findings: −.35 with the BDI removing STAI scores, −.32 with the STAI removing BDI scores, and −.26 with the SADS removing BDI and STAI scores.
who scored at 9 or above on the BDI, thereby allowing trait anxiety to be examined relatively free of depressive symptomatology. The relationship between positive automatic thoughts and anxiety was unchanged, both $r_s = -.37$, $p < .001$. Finally, a correlation between positive automatic thoughts and social anxiety was computed with only nondepressed (BDI, $M < 9$) and nontrait anxious participants (STAI, $M < 38$). Although the correlation remained statistically significant, $r(219) = -.23$, it did represent somewhat of a decrease from the correlation between the ATQ-P and the SADS that did not control for either depression or trait anxiety.

Other studies have also addressed the specificity issue. For example, although Burgess and Haaga (1994) reported a correlation of $-.32$ with the Beck Anxiety Inventory (BAI; Beck, Epstein, Brown, & Steer, 1988), to assess specificity they reexamined the relationship between the ATQ–P and the BAI with BDI scores partialed out. After removing the variance due to depressive symptoms, they found that the ATQ–P no longer correlated significantly with the BAI. Partialing out BAI scores from the correlation between the BDI and ATQ–P revealed, however, that there was still a significant correlation, although the magnitude of this relationship was quite small (.14).

Additional affective specificity information may be gleaned from the SOM ratios reported in Table 1. Three subclinical sample ratios were within what is hypothesized to be the non-distressed range (i.e., Bruch et al., 1993; Ingram, 1989a, 1989b), although all of these ratios were lower than for the comparable nondistressed comparison group. In each case these samples consisted of participants who were selected for uniquely reporting elevated levels of social anxiety. It thus appears that ATQ–P scores are less strongly related to social anxiety than they are to depression or trait anxiety. This finding is consistent with the previously reported data showing a weaker relationship between social anxiety and ATQ–P scores after depressive and trait anxious symptoms are removed.

**Specificity to psychological distress.** Three studies have assessed the specificity of the ATQ–P to psychological distress by examining the measure in pain samples varying in level of psychological distress. Mean ATQ–P scores are presented in Table 1. In one study, Ingram, Slater, et al. (1990) found that participants who evidenced chronic back pain but were not depressed had scores that were quite similar to those of healthy control participants ($M = 104.18$). It was only when participants experienced both pain and psychological distress that ATQ–P scores were lower than those of nondistressed control participants ($M_{5} = 89.41$ and 81.41 for respective subclinical and clinical depression back pain groups). These findings were closely replicated in another study (Ingram, Atkinson, et al., 1990) in which chronic back pain participants who did not evidence depressive symptoms had among the highest ATQ–P scores reported in any study ($M = 111.10$). Again, it was only when chronic back pain participants were also experiencing depressive symptoms...
that their ATQ-P scores were lower ($M = 84.35$) than those of non-distressed controls. Finally, Calfas (1990) compared osteoarthritis patients who were experiencing elevated depressive symptoms to osteoarthritis patients who were not dysphoric. Data indicated that the mean ATQ-P score for nondysphoric osteoarthritis patients was quite similar to that of other normal comparison groups ($M = 107.75$), whereas dysphoric osteoarthritis patients' ATQ-P mean was also quite similar to that of other subclinical or dysphoric groups ($M = 80.45$).

Overall, the results of these studies suggest that ATQ-P scores are specific to psychological distress and do not appear to be linked to conditions that are not accompanied by psychological distress. The samples used to test this specificity hypothesis are limited to two kinds of chronic pain, and of course it is possible that other kinds of life stresses may affect ATQ-P scores. Nevertheless, the data thus far do suggest specificity to psychological distress.

Convergent and Discriminant Validity: Covariation With Existing Measures of Cognition

The previous section examined the relationship between the ATQ-P and various measures of affect. This section addresses convergent and discriminant validity of the ATQ-P as it pertains to measures of cognition. Specially, data are reported on (a) the relationship between the ATQ-P and the ATQ-N, (b) the association between the ATQ-P and measures that have little conceptual similarity to the ATQ-P, and (c) the correlation between the ATQ-P and a conceptually similar measure of positive thinking.

Relationship to the ATQ-N

An important discriminant-validity question concerns the relationship between the ATQ-P and the ATQ-N. Correlations between the ATQ-P and the ATQ-N with various participant groups are presented in Table 2. Ingram and Wisniki (1988) examined the relationship between the two measures and found a relatively low correlation ($r = .29$), leading them to suggest, in line with hypotheses about the relationship between positive and negative emotions (Tellegen, 1985; Watson & Tellegen, 1985), that the constructs of positive and negative cognition may be relatively independent. A number of studies have now been able to examine the relationship between these two measures. As seen in Table 2, overall correlations range between $-.02$ and $-.46$.

In these samples the shared variance ranges from virtually 0 to 22%. Some of this difference may be due to different association strengths in samples that vary in level of psychopathology; for example, participants experiencing distress may produce a stronger association between these measures. To examine this possibility, where available, correlations for distressed and non-distressed samples were compared (see Table 2). Generally the strength of the correlation increases as the level of distress in the sample increases. These results indicate that the relationship between ATQ-P and ATQ-N scores may vary with the severity of psychological distress, suggesting that rather than the ATQ-P and ATQ-N representing constructs that are inversely linked to one another, they may instead be associated by virtue of a third variable.

Relationship to Conceptually Dissimilar Measures

To further test discriminant validity, we gathered additional data for this report. Specifically, the relationship between the ATQ-P and a number of other measures was examined. Several of these measures were chosen because they are intended to assess cognitive constructs and thus represent a test of the discriminant validity of the ATQ-P.

For instance, one measure was the Social Anxiety Thoughts Questionnaire (SAT; Hartman, 1984). If the ATQ-P is simply an inverse measure of cognitions associated with social anxiety, and hence lacks discriminant validity, then correlations with this measure should be high. The SAT contains 21 items that inquire about the thoughts people have in social situations (e.g., "I don't know what to say"; scored on a scale ranging from 1 = never to 5 = always).

Likewise, a measure that one's beliefs are correct, the Self-Righteousness Scale (SRS; Falbo & Belk, 1985), was administered to test whether the ATQ-P might simply constitute a measure of one's beliefs being not only positive but the "correct" kinds of beliefs to endorse. The seven SRS items (e.g., "People who disagree with me are wrong") are scored from 1 (strongly agree) to 5 (strongly disagree).

The Satisfaction With Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985), a measure of subjective life satisfaction was also chosen. It was expected that the ATQ-P would correlate moderately with this measure inasmuch as satisfaction with life should be associated with positive thinking. Yet a high correlation would argue that the ATQ-P offers little unique assessment value beyond that offered by assessing whether a person's life is going well. The SWLS comprises 5 items (e.g., "In most ways my life is close to ideal") that range from 1 (strongly disagree) to 7 (strongly agree).

Similarly, the Compulsiveness Inventory (CI; Squires & Kagan, 1985), a measure of non-pathological compulsive thinking, was administered. It may be, for example, that the ATQ-P is merely a measure of a compulsion to think positive thoughts. The CI contains 11 items (e.g., "Do you have difficulty making up your mind?") scored on a "yes" or "no" basis.

The Coping Strategies Scale (COSTS; Beckham & Adams, 1984) was also chosen. The COSTS includes items that are intended to assess various coping strategies for emotional problems. Participants receive 1 point for each item they answer positively and 0 points for items answered negatively. The scale contains 10 subscales. Rather than administer all 10 of these subscales, four were chosen at random: Emotional Containment (holding or hiding feelings from others, 12 items); Avoidance/Denial (avoiding thinking about problems, 11 items); Cognitive Restructuring (reassessing problems, 20 items); and Passivity (a lack of problem-solving thoughts, 10

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6 Measures were chosen in part because they displayed evidence of adequate reliability and validity. Reliability and validity data can be found in the reference listed for each measure.
items). Again, high correlations would be expected if the ATQ–P is more a measure of coping than an index of positive thoughts in general.

To assess the relationship of the ATQ–P to conceptually related constructs, the BDI was again administered, as were two measures of constructs thought to be related to depressive symptomatology: the Dysfunctional Attitude Scale (DAS; Weissman, 1980), a measure of the beliefs that are related to psychological distress, and the Cognitive Triad Inventory (CTI; Beckham, Leber, Watkins, Boyer, & Cook, 1986), which assesses beliefs about the self, future, and world. Each subscale contains 10 items that are scored on a scale ranging from 1 to 7. The ATQ–P should be at least moderately related to these measures, but correlations that are very high may indicate that the ATQ–P is more of an inverse measure of depression and depression-related constructs than it is a measure of the conceptually separate construct of positive thinking. These measures, randomly ordered, were administered to a sample of 100 undergraduate participants drawn from the research pool of students enrolled in introductory psychology at San Diego State University, who participated to partially fulfill course requirements. Although the sample was primarily female (n = 62), no significant gender differences were found in any of the results in either this sample or the next samples.

In addition to this sample, the relationship between the ATQ–P and self-esteem was assessed in a separate sample of 51 undergraduates. This is a particularly important relationship to assess to ensure that participants are rating the occurrence of thoughts and not actual beliefs. Participants were thus administered both the ATQ–P and the Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1979). The MMPI and the ATQ–P were also administered to a separate sample of 66 undergraduate participants. To examine the MMPI as it is typically used, raw scores were converted to t scores with a mean of 50 and a standard deviation of 10. Correlations were expected to be at least moderate between the ATQ–P and the MMPI scales that assess affective states (e.g., Scale 2: Depression) but lower for other dimensions (e.g., Scale 5: Masculinity–Femininity).

Results are presented in Table 3. As can be seen from this table, the strongest correlations were modest in magnitude. Somewhat surprisingly, the RSE showed a very low correlation with the ATQ–P. Among the strongest associations were between both measures of depression (BDI = −.56, MMPI Depression = −.31); the measure of thinking associated with depression (DAS = −.42); the measure associated with life satisfaction (SWLS = .56); and the degree of socially anxious thoughts (SAT = −.31). Such coefficients would be expected to occur for these constructs, yet none are strong enough to suggest that the ATQ–P is simply an overlapping measure of other constructs. The remaining correlations are quite small to modest. Overall, this pattern is supportive of the discriminant and convergent validity of the measure. Caution, of course, must be exercised in interpreting these findings inasmuch as these data were gathered with undergraduate participants who were presumably experiencing little psychological distress.

Table 3  
Correlations of ATQ–P Scores With Other Measures

<table>
<thead>
<tr>
<th>Test or scale</th>
<th>r</th>
</tr>
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<tbody>
<tr>
<td>Beck Depression Inventory</td>
<td>−.56*</td>
</tr>
<tr>
<td>Dysfunctional Attitudes Scales</td>
<td>−.42*</td>
</tr>
<tr>
<td>Satisfaction With Life Scale</td>
<td>.56*</td>
</tr>
<tr>
<td>MMPI—Depression</td>
<td>−.31*</td>
</tr>
<tr>
<td>Compulsiveness Inventory</td>
<td>−.31*</td>
</tr>
<tr>
<td>Social Anxiety Thoughts</td>
<td>−.30*</td>
</tr>
<tr>
<td>Passivity</td>
<td>−.29*</td>
</tr>
<tr>
<td>MMPI—Psychoasthenia</td>
<td>−.27*</td>
</tr>
<tr>
<td>MMPI—Social Introversion</td>
<td>−.27*</td>
</tr>
<tr>
<td>MMPI—Lie</td>
<td>.22</td>
</tr>
<tr>
<td>CTI—Self</td>
<td>−.20*</td>
</tr>
<tr>
<td>CTI—World</td>
<td>−.20*</td>
</tr>
<tr>
<td>MMPI—Hypomania</td>
<td>.20*</td>
</tr>
<tr>
<td>MMPI—Defensiveness</td>
<td>.19</td>
</tr>
<tr>
<td>MMPI—Masculinity–Femininity</td>
<td>.19</td>
</tr>
<tr>
<td>CTI—Future</td>
<td>−.18</td>
</tr>
<tr>
<td>MMPI—Hypochondrisis</td>
<td>−.16</td>
</tr>
<tr>
<td>Emotional Containment</td>
<td>−.16</td>
</tr>
<tr>
<td>MMPI—Schizophrenia</td>
<td>−.15</td>
</tr>
<tr>
<td>Self-Righteousness</td>
<td>−.13</td>
</tr>
<tr>
<td>MMPI—Hysteria</td>
<td>−.12</td>
</tr>
<tr>
<td>MMPI—Psychopathic Deviance</td>
<td>−.11</td>
</tr>
<tr>
<td>Avoidance</td>
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<tr>
<td>MMPI—Frequency</td>
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</tr>
<tr>
<td>Rosenberg Self-Esteem</td>
<td>.06</td>
</tr>
<tr>
<td>Cognitive Restructuring</td>
<td>−.05</td>
</tr>
<tr>
<td>MMPI—Paranoia</td>
<td>.00</td>
</tr>
</tbody>
</table>

Note. ATQ–P = Positive Automatic Thoughts Questionnaire; MMPI = Minnesota Multiphasic Personality Inventory; CTI = Cognitive Triad Inventory.  
* p < .05.

the ATQ–P, these measures should show a substantial degree of association. In fact, Burgess and Haaga (1994) found a correlation of .74 between these measures. This correlation coefficient, although not indicating complete overlap, is stronger than the relationship between the ATQ–P and any other measure. The only higher correlations that have been found for the ATQ–P are reliability coefficients. These data therefore suggest that the ATQ–P possesses good convergent validity.

Sensitivity to Cognitive Change

The sensitivity of the ATQ–P to detect changes in the amount of positive thinking is an important one. To assess change variables, however, it is important that the measure exhibit specificity to situational contexts; that is, ATQ–P differences should be observed in situations where positive cognitions are likely to have changed and correspondingly should not change in situations where positive cognitions are unlikely to have changed. One set of data reported in this section were specifically collected for this article to assess the specificity of ATQ–P changes. In addition, data gathered by Ingram, Bernet, and McLaughlin

1 We are indebted to the anonymous reviewers who suggested this possibility.
(1994) also provide an opportunity to assess the specificity of
cognitive shifts as reflected by ATQ-P scores.

Under what circumstances should ATQ-P changes be ob-
served? Note that the typical ATQ-P instructions ask respon-
dents to rate the frequency of positive thoughts over a period of
a week. Thus, one situation where changes should not be ob-
served is in response to momentary shifts in cognition that are
linked to transient mood states. Indeed, to the extent that the
ATQ-P is intended to measure normative levels of positive cog-
nition during the past week, covariance with current mood
states represents a serious threat to the validity of the measure.
Alternatively, if the ATQ-P instructions are specifically modi-
fied to reflect momentary rather than weekly levels of positive
cognition, then the ATQ-P should reflect transient shifts.

Person-by-situation specificity should also be observed in
ATQ-P scores. For example, although items can be modified
to reflect current mood states, not all individuals would be ex-
pected to evidence shifts in their current states. Previous data
have suggested that is unlikely that people in a depressed state
will respond to positive events with positive cognition (Ingram
et al., 1983). It is doubtful that a positive mood induction would
negate the distressful circumstances of an individual's life
enough to trigger positive cognition.

Covariance of ATQ-P Scores With Current Mood and
Remission From Depression

As noted previously, unpublished data collected by Ingram,
Bernet, and McLaughlin (1994) provide an opportunity to as-
sess whether ATQ-P scores are responsive to transient mood
states. This study also affords the opportunity to compare the
ATQ-P responses of nondepressed individuals who have a his-
tory of clinically significant depression with people who have no
history of psychiatric disturbance. Data have shown that when
depression normalizes, so too do the processes that typically
accompany the disorder (Ingram, Miranda, & Segal, in press;
Segal & Ingram, 1995). In the case of positive cognition, al-
though the data reviewed in this article have consistently shown
that ATQ-P scores are lower for individuals who are depressed
or psychologically distressed, it should be the case that positive
cognition rebounds when the depression remits. Hence, no
ATQ-P differences between never-depressed and formerly de-
pressed participants would be anticipated.

In addition to comparing formerly depressed with never-de-
pressed participants on several cognitive measures in the In-
gram, Bernet, and McLaughlin (1994) study, half of their par-
ticipants received a sad-mood induction to assess mood-state
dependency hypotheses. Results indicated that the ATQ-P
scores for formerly depressed individuals ($M = 94.64$) were in-
distinguishable from those of individuals who had never expe-
rienced a depressive episode ($M = 93.84$). Moreover, even
though significant differences in sad mood were obtained be-
 tween the mood-induction and the non-mood-induction
groups, no ATQ-P differences were found as a function of the
mood induction. Although caution must always be exercised in
interpreting a lack of differences, these data are consistent with
the idea that ATQ-P scores return to normal when depression
remits and that reports of the frequency of positive cognitions
over a week are not influenced by transient mood states.

Person-by-Situation Sensitivity to Change

The following study was conducted for this report and will
therefore be described in somewhat greater detail. In this study,
some individuals were exposed to a positive stimulus designed
to increase favorable self-relevant cognitions. In contrast to pre-
vious experiments, the instructions to the ATQ-P were modi-
fied to ask participants the kinds of thoughts they experienced
during the experiment. As discussed earlier, not all individuals
would be predicted to evidence cognitive changes; one excep-
tion to the cognitive triggering effects of positive situational
events would be for individuals already experiencing dysphoric
affect and symptoms.

The participants in this study were 46 introductory psychol-
ogy students at San Diego State University who participated to
partially fulfill course requirements. Participants were pre-
selected on the basis of scores on a D30 depression scale
(Dempsey, 1964) administered before the beginning of the ac-
tual study. A score of 14 on the D30 corresponds to an MMPI
Depression scale $T$ score of 70 and thus was used as the cutoff
for depressive affect. Individuals who scored above this cutoff
($M = 15.8$) constituted the dysphoric group, whereas partici-
pants scoring at or below 6 (a $T$ score of 50; $M = 4.1$) served as
the nondysphoric (normal) control group.

At the time of the actual study but before the induction, par-
ticipants completed the BDI to ensure that prior depression lev-
els remained constant (Kendall et al., 1987). Previously dys-
phoric participants who failed to score at least 10 on the BDI
(the cutoff for mild depression) and previously nondysphoric
participants who scored in the dysphoric range were excluded
from further participation in the study. Thus, participants in
the dysphoric group ($BDI, M = 18.2$) scored in the dysphoric
range on two different measures on two different occasions. Ad-
ministration of the BDI at this time also ensured that dysphoric
participants were experiencing depressive affect and symptom-
atology at the time they completed the study measures.

All participants were randomly assigned to either a positive-
stimulus condition or to a no-stimulus control condition. In the
positive-stimulus condition, participants were exposed to a mu-
sical mood induction designed to precipitate positive cognition.
The effectiveness of such procedures has been reported by sev-
eral investigators (e.g., Clark, 1983; Clark & Teasdale, 1985;
Sutherland, Newman, & Rachman, 1982). To develop a music
stimulus aimed specifically at facilitating positive thought, 31
undergraduates enrolled in psychology classes at San Diego
State University rated a variety of different kinds of music (e.g.,
classical, jazz, contemporary). These participants were similar
in background and characteristics to the participants used in
the experimental study. Each music selection was rated on a
Likert scale of 0 to 10 (0 = neutral, 2 = moderately positive/
happy, 5 = positive/happy, 7 = very positive/happy, 10 = ex-
tremely positive/happy). Although previous studies have used
primarily classical music (e.g., Clark & Teasdale, 1985), these
participants responded the most positively to contemporary
music. Therefore, excerpts from contemporary music that
achieved ratings of greater than or equal to 5 (M = 6.5; just below very positive/happy) were assembled together on an audiotape to constitute the positive-cognition stimulus.

Following completion of the BDI, the experimenter told the participants that he or she would be leaving the room for a while. Participants in the positive-affect induction condition were asked to relax and listen to some music until the experimenter returned. After the allotted time, participants were asked to complete the combined ATQ-P and ATQ-N scales. Participants in the control group remained for a comparable period of time and completed the measures without listening to the music.

A 2 (Dysphoric Condition) × 2 (Induction) × 2 (ATQ Measure) mixed analysis of variance (ANOVA) was conducted on participants’ ATQ scores. Means are presented in Table 4. Results indicated significant effects for participants’ dysphoria level, $F(1, 41) = 21.04$, $p < .01$; ATQ measures, $F(1, 41) = 16.32$, $p < .001$; ATQ measures by participant dysphoria level, $F(1, 41) = 65.91$, $p < .001$; and ATQ measures by music induction, $F(1, 41) = 4.68$, $p < .03$; and a near-significant interaction between participants’ affect level, mood induction, and ATQ measures, $F(1, 41) = 3.29$, $p < .07$.

Comparisons indicated that nondysphoric participants receiving the positive induction reported significantly more positive thoughts and significantly fewer negative thoughts, $t(41) = 2.06$, $p < .05$, and $t(41) = 3.15$, $p < .01$, respectively, than did control participants. No effects were found for dysphoric participants. The only differences among these participants were that more negative than positive thoughts were reported in both conditions, both $ps < .03$.

These results suggest that ATQ-P responses covaried with the music induction for nondysphoric control participants; the induction group showed a significantly higher frequency of positive thoughts relative to no-induction participants. The same pattern was found for negative automatic thoughts for the nondysphoric participants; fewer of these thoughts were found in the positive induction condition as compared with the control condition. For dysphoric participants, on the other hand, the ATQ-P and ATQ-N scores remained stable across experimental conditions. Thus, these data are consistent with person-by-situation predictions and suggest that both the ATQ-P and ATQ-N appear to be change-sensitive measures in individuals who should be cognitively responsive to situational variables.

Summary, Limitations, and Conclusions

Before summarizing the current findings, several potential limitations must be noted. First, ethnic and cultural variables do not appear to have been assessed in any of the data reported here. It is thus unclear whether such differences exist, and if so, how they affect the psychometric properties of the measure. Additionally, although the measure appears to have good test–retest reliability, this conclusion must be tempered to some degree by the fact that multiple administrations can result in high reliability estimates because of memory or reactive effects. Common method variance must also be acknowledged. That is, virtually all of the data reported in this article rely on self-report, questionnaire assessment. It is thus possible that the correlations providing evidence of convergent validity may be at least somewhat increased by variance due to using the same kinds of assessment format. Relatedly, correlations inflated by item overlap cannot be ruled out; to the extent that some items on the ATQ-P and other measures overlap (e.g., the other cognitive questionnaires administered), the magnitude of correlations will be artificially increased. On the other hand, it can also be noted in this vein that if these correlations are increased by shared method or item variance, then low correlations showing discriminant validity may be similarly inflated. This possible limitation for convergent validity conversely offers further support for the discriminant validity of the ATQ-P.

Although the data on change sensitivity were consistent with expectations about the ability of the ATQ-P to detect cognitive differences in varying situational contexts, some caution must be exercised because of the lack of differences obtained in several of the analyses. Although the study comparing formerly depressed to never-depressed participants provided an opportunity to initially examine data on the issue of covariance with current mood and remission status, prospective studies that do not depend on acceptance of the null hypothesis are needed to fully evaluate when the ATQ-P should and should not change.

Possible limitations notwithstanding, the data reviewed in this article suggest that the ATQ-P (a) has stable norms, (b) reliable scores, (c) discriminates between psychopathological and nonpsychopathological states and conforms to models that specify the relationship between positive and negative thinking, (d) is specific to psychological distress, (e) is unaffected by social desirability influences, (f) has good convergent and discriminant validity, and (g) is sensitive to change in affective states.

An area where the data are not as clear concerns the specificity of the ATQ-P to different kinds of psychological distress. Although Burgess and Haaga (1994) reported data suggesting that the measure is specific to depressive symptoms, data reported in this article indicated that decreased ATQ-P scores are characteristic of both depressive and trait-anxiety symptoms. The one exception to this was the case of social anxiety, in which every study showed that decreased ATQ-P scores were not characteristic of this state. The reasons for this are unclear. It may be, for example, that social anxiety is simply not characterized

<table>
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<th>Group</th>
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<th>No induction</th>
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<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$M$</td>
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</tbody>
</table>
by decreases in positive cognition or alternatively that the state-dependent context of this kind of anxiety (i.e., that it only arises in certain social contexts) may have precluded finding decreased positive thinking except when the state is activated. Further research will be needed to address this issue more fully. Such issues aside, however, the current review offers support for the ATQ-P as a valid and reliable measure of positive self-referent cognition.

References


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