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ORIGINAL ARTICLE

# Cognitive Personality Characteristics Impact the Course of Depression: A Prospective Test of Sociotropy, Autonomy and Domain-Specific Life Events

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**Abstract** Prospective tests of the impact of sociotropy and autonomy on the course of depression are lacking. In a sample of 97 cognitive high-risk and 62 cognitive low-risk undergraduates who experienced at least one prospective depressive episode, the interactions of sociotropy and interpersonal life events and autonomy and achievement-related life events were examined as predictors of four indicators of the course of depression. Initial analyses failed to support the hypothesis that global scores for sociotropy and autonomy interact with domain-congruent life events to predict the course indicators. The autonomy-achievement events interaction predicted less severe episodes, contrary to hypothesis. Then, factors hypothesized to underlie Sociotropy (Fear of Criticism and Rejection; Preference for Affiliation) and Autonomy (Independent Goal Attainment; Sensitivity to Others' Control; Bieling et al., Cognitive Ther Res 24:763–780, 2000) were also analyzed. The puzzling autonomy-achievement life event interaction was explained by the underlying Independent Goal Attainment factor. Interactions between Fear of Criticism and Rejection and achievement events, and between Sensitivity to Others' Control and interpersonal events, significantly predicted chronicity, number and severity of episodes. The findings are discussed in terms of the event-congruency hypothesis.

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## Introduction

Two cognitive personality characteristics, sociotropy and autonomy, have received much attention with regard to the role that they may play in the genesis, presentation, and treatment of depression. Initially proposed by Beck (1983) as important components of a vulnerability-stress model of depression, sociotropy and autonomy were hypothesized to be predisposing dimensions or "modes" that conferred vulnerability to different kinds of depression-precipitating events, different depressive symptom profiles and differential responses to various therapeutic techniques. Sociotropy refers to an investment in positive interactions with other people. Autonomy, on the other hand, refers to an investment in protecting one's independence and/or control over one's domain. Beck (1983) suggested that although depressed individuals typically demonstrate a premorbid personality dominated by one mode over the other, some could display a mixture of the two.

Several of the hypotheses generated from Beck's (1983) sociotropy-autonomy model have been tested and, generally, supported. In line with Beck's (1983) original theory, these cognitive personality characteristics have proven not to be simply latent diatheses for depression. They can influence the social environment (generating particular life events; e.g., Hammen et al. 1985, 1989b; Daley et al. 1997), increasing one's vulnerability for the onset of depression, and conceivably impacting the course the disorder takes as it unfolds. Indeed, the cognitive personality vulnerability theory provided by Beck does hold the promise of predicting the course of depression as well as

the likelihood and mechanism of onset, but remarkably few studies have investigated hypotheses regarding depression's course. Exceptions include studies examining the symptom specificity associated with sociotropy or autonomy (see Robins et al. 1997; Alford and Gerrity 1995; Clark and Beck 1991; Moore and Blackburn 1994; Persons et al. 1993; Robins et al. 1989; Robins and Luten 1991). Beyond symptom specificity, Hammen et al. (1989a) concluded that the interaction of autonomy scores and achievement-related life events predicted the severity of depressive symptoms in the 3-month period following the life event, whereas the interaction of sociotropy scores and interpersonal events did not. In addition to symptom severity, other key indicators of the course of depression include the number and duration of episodes experienced and the chronicity of depression. Mongrain and Blackburn (2005) found that, in a sample of graduate students, sociotropy was associated with the number of previous episodes of depression, and autonomy with recurrence of the disorder. Thus, preliminary evidence suggests that sociotropy and autonomy do, in fact, impact the course of depression.

Importantly, these studies begin to highlight the heterogeneity of features that might comprise a sociotropic or autonomous mode. This makes these cognitive personality modes difficult to operationally define and assess, and critiques of the Sociotropy-Autonomy Scale (SAS; Beck et al. 1983, Unpublished manuscript) have reflected this (e.g., confounding of the SAS item content and negative affectivity; Solomon and Haaga 1994). The factor structure of the SAS has also been debated. Bieling et al. (2000) note that sociotropy appears to comprise factors resembling Preference for Affiliation and Fear of Criticism and Rejection (for clarity, herein termed SOC: Preference for Affiliation and SOC: Fear of Criticism and Rejection, respectively), which are both positively and significantly associated with various indices of psychopathology. Autonomy appears to comprise factors of Sensitivity to Others' Control and Independent Goal Attainment (herein termed AUT: Sensitivity to Others' Control and AUT: Independent Goal Attainment). With respect to these factors, Bieling et al. (2000) note that AUT: Independent Goal Attainment appears to serve as a buffer against stressors, whereas AUT: Sensitivity to Others' Control is positively associated with psychopathology, albeit weakly. So a high score on the SAS autonomy scale could at the same time represent a protective factor against the development of psychopathology (via AUT: Independent Goal Attainment) or a predisposing factor (via AUT: Sensitivity to Others' Control). Moreover, these factors could conceivably interact differently with interpersonal and achievement-related life events than might be expected for overall scores for sociotropy and autonomy. For instance, SOC: Fear of Criticism and Rejection might be expected to interact with achievement-related life events and AUT: Sensitivity to Others' Control could understandably interact with interpersonal life events. Accordingly, studies of sociotropy and autonomy should be mindful of the underlying factor structure and include these factors in analyses when possible, as well as investigate the interaction with domain-specific life events, in line with Beck's (1983) original vulnerability-stress conceptualization of these cognitive personality dimensions.

The present study sought to investigate the role of the sociotropy-interpersonal life event and autonomy-achievement life event interactions in the course of depression by assessing the number, duration and severity of episodes experienced, and the overall chronicity of the depression, using a prospective, longitudinal design in a large sample of initially nondepressed individuals. This design overcomes some of the methodological limitations of prior studies, in which levels of sociotropy and autonomy were assessed while participants were depressed and only one depressive episode was examined. According to the event-congruency hypothesis, we expected the sociotropy-interpersonal events and autonomy-achievement events interactions to predict worse course of depression (i.e., a higher number of episodes of greater duration and severity, and a more chronic course over the study period). To help explain these interaction effects, secondary analyses utilizing the Bieling et al. (2000) subscales were also conducted to investigate the role of these underlying factors in interaction with life events.

## Method

### Participants

This study used data from the Temple-Wisconsin Cognitive Vulnerability to Depression Project (CVD Project; Alloy and Abramson 1999), a prospective study of cognitive and psychosocial factors in the development of depressive disorders among college freshmen at high and low cognitive risk for depression. Details of the selection procedures are in Alloy et al. (2000). In Phase I, the Cognitive Style Questionnaire (CSQ; Alloy et al. 2000) and Dysfunctional Attitudes Scale (DAS; Weissman and Beck 1978) were given to 5,378 freshmen. Those who scored in the highest or lowest quartiles on *both* the CSQ composite for negative events and the DAS were considered the high-risk (HR) and low-risk (LR) groups, respectively. In Phase II, a random subset of participants who met the Phase I criteria for the HR or LR groups were given an expanded Schedule for Affective Disorders and Schizophrenia-Lifetime diagnostic interview (SADS-L; Endicott and Spitzer 1978) by

interviewers who were blind to risk status. Based on DSM-III-R (American Psychiatric Association 1987) and RDC (Spitzer et al. 1978) criteria, participants were excluded if they exhibited any current Axis I disorder, psychotic symptoms, or any serious medical illness. Participants were retained if they met diagnostic criteria for a past depressive disorder but had remitted for at least 2 months (to ensure that the onset of any depressive episodes during the prospective phase were new episodes and not relapses). On average, the most recent past episode of depression was 2.31 years (SD = 2.44 years) before Phase I. The CVD Project sample included 172 HR and 175 LR participants (see Alloy et al. 2000 for sample demographics and representativeness).

The present study was based on CVD Project participants who experienced at least one depressive episode during the first 2.5 years of prospective follow-up and for whom all relevant data were collected, resulting in 97 HR and 62 LR participants. The groups did not differ on age, gender or ethnicity. The sample was 73.0% female and 87.3% Caucasian, with a mean age of 18.7 years (See Iacoviello et al. 2006 for detailed sample demographics).

## Measures

The Beck Depression Inventory (BDI; Beck et al. 1979) is a 21-item self-report questionnaire that measures the subjective severity of depressive symptoms. The BDI was given at Time 1 and at every 6-week prospective assessment. It provided a measure of baseline depressive symptoms, as well as one measure of the severity of each depressive episode experienced. The BDI has high internal consistency and test–retest reliability, and has well-demonstrated validity with both psychiatric and nonclinical samples (Beck et al. 1988).

The Schedule for Affective Disorders and Schizophrenia- Lifetime version (SADS-L; Endicott and Spitzer 1978) is a widely used structured diagnostic interview that assesses current and past psychopathology according to the RDC and has demonstrated high inter-rater and test–retest reliabilities (Endicott and Spitzer 1978). The SADS-L was used in this study as part of the Phase II screening procedure. For the CVD project, the SADS-L was expanded in several ways (Alloy and Abramson 1999; Alloy et al. 2000): (1) Additional questions were included to allow DSM-III-R diagnoses to be made; (2) A more precise set of initial "probes" was included to assess the persistence of depressed mood; (3) Components of the Anxiety Disorders Interview Schedule (ADIS; DiNardo et al. 1985) were included in the anxiety section; (4) Items were reorganized such that all items relevant to a particular disorder, both past and current, were presented together; and (5) Questions were included to assess the hopelessness subtype of depression based on the hopelessness theory (Abramson et al. 1989). The expanded version of the SADS-L has also demonstrated high levels of inter-rater reliability, with $\kappa$'s for all diagnoses $\geq$.90 (Alloy et al. 2000). As regards validity, HR participants in the CVD project were found to have greater lifetime prevalence than LR participants of DSM-III-R and RDC major depression (38.7% vs. 17.0%, $F(1,338) = 9.48$, $P < .01$) and RDC minor depression (22.0% vs. 11.9%, $F(1,332) = 3.03$, $P < .08$) as assessed by the expanded SADS-L (Alloy et al. 2000).

To assess the onset and offset of depressive episodes over the course of the study and for tracking symptoms and the course of depression, an expanded SADS-Change (SADS-C; Spitzer and Endicott 1978) interview was given every 6 weeks throughout the 2.5-year prospective follow-up. The SADS-C was expanded for the CVD Project in a manner similar to the SADS-L, with the addition that the SADS-C was expanded to include DSM-IV diagnoses as well (see Alloy et al. 2006). Moreover, features of the Longitudinal Interval Follow-up Evaluation (LIFE-II; Shapiro and Keller 1979) were also incorporated into the expanded SADS-C to track the course of depression. In the CVD project, inter-rater reliability of the expanded SADS-C (based on 125 interviews) was high ($\kappa$'s $\geq$ .90) for all diagnoses (Alloy et al. 2006). Test–retest reliability (based on 80 interviews), in which independent interviewers interviewed the same participant within 2 days of each other for the same 6-week interval (blind to the results of the other interview), obtained a mean $r = .97$ between interviewers for day-by-day dating of depressive episodes. Validity of the expanded SADS-C interview is demonstrated by the finding that HR participants were more likely to have prospective onset of DSM-IV and RDC major depression (23.27% vs. 5.15%, OR = 6.66) and RDC minor depression (51.71% vs. 21.12%, OR = 3.53) episodes (Alloy et al. 2006).

Following Iacoviello et al. (2006), among those HR and LR participants who experienced at least one prospective major or minor depressive episode, the depression course variables were operationalized as follows: *Episode duration* was the average duration, in days, of all prospective episodes of DSM-IV and RDC major and RDC minor depression. *Chronicity* was the percentage of total days in the study a participant spent either in a major or minor depressive episode, experiencing subsyndromal symptoms of depression prodromal to the onset of a diagnosable episode, or in partial remission from an episode. This is an encompassing, and somewhat novel, way of operationalizing the chronicity of depression. The *number of episodes* was the total number of diagnosable major and minor episodes, as defined by DSM-IV and RDC criteria. *Depression severity* was based on both clinician ratings (SADS-C) and self-report (BDI). The number of SADS-C

symptoms rated as clinically significant (SADS-C score of 3 or higher) for each episode was averaged to obtain an overall clinician-rated severity score (possible range 2–36), and the BDI scores for each episode were also averaged for an overall self-report severity score (possible range 0–63). Given that the average number of SADS-C symptoms and average BDI score were highly and significantly correlated with each other ($r = .56$, $P < .001$), we created a composite score of the self- and clinician-rated severity measures. Thus, z-scores were computed for the average BDI and average number of SADS-C symptoms, and these z-scores were averaged to compute a composite severity score.

The Sociotropy-Autonomy Scale (SAS; Beck et al. 1983, Unpublished manuscript) is a 60-item questionnaire that was administered to each participant at Time 1 to assess levels of the cognitive personality dimensions of sociotropy and autonomy. The 30-item sociotropy and autonomy Total scales have high internal reliability as indicated by coefficient $\alpha$'s of .90 and .83, respectively (Beck et al. 1983, Unpublished manuscript). For the purposes of this study, subscale scores for SOC: Fear of Criticism and Rejection, SOC: Preference for Affiliation, AUT: Independent Goal Attainment, and AUT: Sensitivity to Others' Control were also calculated from the SAS, following Bieling et al. (2000). In the present sample, with respect to cognitive risk status, the low-risk group had a mean SOC score of 59.32 (SD = 21.03; min = 23; max = 106; $\alpha = .938$) and a mean AUT score of 99.51 (SD = 11.86; min = 76; max = 130; $\alpha = .619$). The high-risk group had a mean SOC score of 89.80 (SD = 18.92; min = 56; max = 133; $\alpha = .937$), and a mean AUT score of 95.14 (SD = 14.24; min = 60; max = 150; $\alpha = .793$). For the entire sample (i.e., collapsing across risk status), $\alpha = .937$ for SOC, and $\alpha = .727$ for AUT.

The Life Events Scale (LES; Alloy and Clements 1992; Needles and Abramson 1990) was designed for the CVD Project and includes 134 major and minor negative life events in content domains relevant to college students. Each LES item provides the opportunity to indicate whether a specific event/situation happened (e.g., "Did poorly on or failed an exam or major project in an important course"; "Unwanted final breakup of a relationship with boyfriend/girlfriend/spouse"). Then, the participant is asked to provide the number of event occurrences for three separate, 2-week periods covering the past 6 weeks since the last assessment. All of the LES events/situations have been categorized a priori as interpersonal- or achievement-related or neither by Alloy and Abramson separately, and then these decisions were compared for any discrepancies. Any differences were discussed by the researchers, and a consensus on these items was reached. The results were 87 interpersonal, 28 achievement, and 19 other events. The Stress Interview (SI) is the interview component of the life events assessment that accompanied the LES. The interviewer probes about every event endorsed on the LES to determine if the experience meets the predetermined set of definitional criteria for that event. If not, the event is disqualified and not counted in final event totals. Thus, the probes serve as a validity and reliability check. Reliability and validity of the combined LES/SI procedures has yielded excellent results (Alloy and Abramson 1999; Safford et al. 2007).

The Cognitive Style Questionnaire (CSQ; Alloy et al. 2000) assesses the internality, stability, and globality of causal attributions, as well as inferred consequences and self-worth implications for 24 hypothetical positive and negative events. In the CVD Project, an additive composite score of the stability, globality, consequences, and self dimensions for negative events was used to select HR and LR participants (along with the DAS). Coefficient $\alpha$ of the negative event composite was .88 and the 1-year test–retest reliability was $r = .80$ (Alloy et al. 2000). With respect to validity, the CSQ in combination with the DAS (below) significantly predicts lifetime history and prospective onset of depressive episodes (Alloy et al. 2000, 2006).

The Dysfunctional Attitudes Scale (DAS; Weissman and Beck 1978) assesses perfectionistic expectations of performance, concerns about disapproval, pessimism and causal attributions. In the CVD project, 24 additional achievement- and interpersonally oriented items were added to the DAS. Internal consistency and test–retest reliability over 1 year for the expanded DAS were good ($\alpha = .90$ and $r = .79$, respectively; Alloy et al. 2000).

## Procedures

Participants provided informed consent and were paid for their participation throughout the duration of the study. After the Phase II assessment using the SADS-L and BDI, and a comprehensive Time 1 assessment including the SAS, participants were interviewed every 6 weeks for the first 2.5 years of the study. Among other measures, each prospective assessment included the expanded SADS-C, as well as the LES, SI and BDI.

## Data Analytic Strategy

To examine whether sociotropy and autonomy, in interaction with domain-specific life events, predicted the depression course indicators, hierarchical regression analyses were conducted. This analytic procedure allows for the control of covariates potentially related to the course indicators and allows for an understanding of the cognitive personality characteristics' ability to predict the depression

course indicators, in interaction with their domain-specific life events, above and beyond these covariates. Separate analyses were conducted for each interaction. We also conducted separate analyses of the sociotropy-achievement event and autonomy-interpersonal event interactions, with hypotheses that these interactions would not be predictive of any course indicators, to support the specificity of the hypothesized interaction effects.

Initial analyses of sociotropy and autonomy were somewhat puzzling (see results below). To further explore the interaction effects of sociotropy and autonomy and the life events, hierarchical regression analyses of the subscale scores for sociotropy and autonomy, in interaction with the life events, were conducted.

Initially, age, gender, ethnicity, site, and baseline (Time 1) BDI score were considered as possible covariates for these analyses. Preliminary analyses examined the correlations between these variables and the course indicators. It was found that age, gender and ethnicity were not significantly correlated with the course indicators and, thus, were not included as covariates in the final analyses. Given that site and baseline BDI score were significantly correlated with some of the course indicators, they were entered as covariates in Step 1 of the main hierarchical regression analyses to control for their effects, as well as the dichotomous score for whether or not the participant had experienced a previous depressive episode before the start of the study; 94 of the 159 participants had a prior history of depression before entering the study. Step 2 included the duration, in days, that participants were followed in the study. This controlled for differences in the number of life events reported due to differing durations of follow-up in the study. In Step 3, either the sociotropy or autonomy score or the subscale score and either the interpersonal life events count or the achievement-related life events count were included. Finally, Step 4 included the interaction of the predictor variables included in Step 3.

## Results

Table 1 presents the means and standard deviations for the course indicators. Table 2 presents the correlations among sociotropy and autonomy scores and their subscales,

**Table 1** Means and Standard Deviations (SD) for the course of depression indicators by risk status

| | High risk | | | Low risk | | |
|---|---|---|---|---|---|---|
| | *N* | Mean (range) | SD | *N* | Mean (range) | SD |
| Chronicity (% days) | 97 | 50.95 (3–100) | 0.32 | 62 | 33.47 (2–100) | 0.28 |
| Number of episodes | 97 | 2.93 (1–11) | 2.19 | 62 | 1.95 (1–6) | 1.37 |
| Average duration of episode (days) | 97 | 18.81 (5–136) | 17.64 | 62 | 15.95 (6–108) | 15.88 |
| Average highest number of SADS-C symptoms | 96 | 10.38 (2–21) | 3.70 | 61 | 8.44 (0–16) | 3.18 |
| Average highest BDI | 97 | 11.61 (0–39) | 7.43 | 62 | 7.10 (0–35) | 6.33 |
| Severity composite z-score (BDI and SADS-C symptoms) | 96 | 0.209 (−1.21–3.23) | 0.877 | 61 | −0.336 (−1.82–2.21) | 0.684 |

**Table 2** Correlations between life events, cognitive personality variables and course indicators ($N = 159$)

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Interpersonal events | 1.00 | .458[b] | −.082 | .041 | .039 | .002 | .061 | .087 | .413[b] | .295[b] | .156[a] | .221[b] |
| 2 | Achievement events | | 1.00 | .032 | .059 | .126 | .028 | .006 | .125 | .218[b] | .206[b] | .034 | .024 |
| 3 | Sociotropy | | | 1.00 | −.068 | .759[b] | .664[b] | −.420[b] | .136 | .146 | .174[a] | −.002 | .055 |
| 4 | Autonomy | | | | 1.00 | −.304[b] | −.360[b] | .710[b] | .660[b] | −.075 | −.114 | .153 | .039 |
| 5 | SOC: Fear of Criticism & Rejection | | | | | 1.00 | .661[b] | −.589[b] | .192[a] | .245[b] | .355[b] | .052 | .205[a] |
| 6 | SOC: Preference for Affiliation | | | | | | 1.00 | −.382[b] | −.069 | .144 | .203[a] | −.140 | .077 |
| 7 | AUT: Independent Goal Attainment | | | | | | | 1.00 | .054 | −.109 | −.148 | .018 | −.106[a] |
| 8 | AUT: Sensitivity to Others' Control | | | | | | | | 1.00 | .193[a] | .190[a] | .058 | .275[b] |
| 9 | Number of episodes | | | | | | | | | 1.00 | .629[b] | .104 | .270[b] |
| 10 | Chronicity | | | | | | | | | | 1.00 | .172[a] | .233[b] |
| 11 | Average duration | | | | | | | | | | | 1.00 | .253[b] |
| 12 | BDI and SADS-C symptom composite | | | | | | | | | | | | 1.00 |

[a] Significant at the 0.05 level (2-tailed)

[b] Significant at the 0.01 level (2-tailed)

interpersonal and achievement events, and the four course indicators (chronicity, number of episodes, average duration of episodes and severity).

Examination of the data revealed that the assumptions for multiple regression were met. A bivariate scatterplot of the variables of interest revealed that the assumption of linearity appeared to be met for each regression. Histograms of the residuals suggest that they were all normally distributed. No transformations were required of the data. As the predictor variables were not significantly correlated with one another, multicollinearity was not a concern. It should be noted that while there were five outliers for the number of episodes variable and two for the duration variable, analyses conducted with and without these outliers yielded similarly significant results. Accordingly, results reported herein include all data, including the outliers.

Detailed tables are provided for significant interaction effects. Results of the hierarchical regression analyses for sociotropy-interpersonal and autonomy-achievement related life event interactions yielded non-significant effects predicting average episode duration ($t(157) = 1.503$, n.s and $t(157) = .705$, n.s., respectively), chronicity ($t(157) = .115$, n.s and $t(157) = 1.175$, n.s., respectively) and number of episodes ($t(157) = 1.670$, n.s and $t(157) = .016$, n.s., respectively). Analyses of the reverse (i.e., sociotropy-achievement event and autonomy-interpersonal event) interactions were also conducted to test the specificity of the hypotheses. As hypothesized, these interactions also yielded non-significant results for duration ($t(157) = .797$, n.s and $t(157) = 1.282$, n.s., respectively), for chronicity ($t(157) = -.131$, n.s. and $t(157) = 1.206$, n.s., respectively), and for number of episodes ($t(157) = .946$, n.s. and $t(157) = .311$, n.s., respectively). Table 3 shows that there was a significant interaction between autonomy and achievement-related events in predicting the composite score for severity ($t(155) = -2.042$, $P = .043$, $\Delta R^2 = .024$), although the direction of the interaction was the reverse of that predicted by traditional Beckian theory. Here too, the sociotropy-achievement events ($t(155) = .066$, n.s.) and autonomy-interpersonal events ($t(155) = -1.615$, n.s.) interactions were non-significant.

Tables 4–6 show the results for the sociotropy and autonomy subscales in interaction with interpersonal and achievement-related life events predicting the course indicators. None of the subscale score-by-life event interaction terms significantly predicted the duration of depressive episodes. The first section of Tables 4–6 show that the interaction of the SOC: Fear of Criticism and Rejection subscale with achievement events predicted a more chronic course of depression ($t(157) = 2.650$, $P = .009$, $\Delta R^2 = .038$), as did the interaction of the AUT: Independent Goal Attainment subscale and interpersonal life events ($t(157) = 2.246$, $P = .026$, $\Delta R^2 = .026$).

A similar pattern of results was obtained for the number and severity of depressive episodes. Part 2 of Tables 4–6 display the interactions between SOC: Fear of Criticism and Rejection and achievement events ($t(157) = 2.404$, $P = .017$, $\Delta R^2 = .032$) and AUT: Sensitivity to Others' Control and interpersonal events ($t(157) = 3.814$, $P < .001$, $\Delta R^2 = .076$), which significantly predicted a higher number of depressive episodes over the study period. Part 3 of Tables 4–6 show significant interactions between SOC: Fear of Criticism and Rejection and achievement events ($t(155) = 2.439$, $P = .016$, $\Delta R^2 = .033$) and AUT: Sensitivity to Others' Control and interpersonal events ($t(155) = 3.209$, $P <= .002$, $\Delta R^2 = .056$) predicting more severe episodes of depression over the course of prospective follow-up. The AUT: Independent Goal Attainment-by-achievement events interaction significantly

**Table 3** Hierarchical regression for variables predicting depression severity ($N = 156$)

| | Variable | $\beta$ | $t$ | $P$ | $\Delta R^2$ | 95% CI for B | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower | Upper |
| Step 1 | Site | −.191 | −2.483 | .014 | | | |
| | Baseline BDI | .283 | 3.654 | .000 | | | |
| | Prior depression | .102 | 1.336 | .184 | .120 | | |
| Step 2 | Days in study | −.070 | −.884 | .378 | .004 | | |
| *Sociotropy and interpersonal events analysis* | | | | | | | |
| Step 3 | Sociotropy | .072 | .752 | .453 | | | |
| | Interpersonal events | .159 | 2.032 | .044 | .026 | | |
| Step 4 | Socio. * Interpers. Interaction | .023 | .075 | .940 | .001 | −.001 | .001 |
| *Autonomy and achievement events analysis* | | | | | | | |
| Step 3 | Autonomy | .164 | 1.971 | .051 | | | |
| | Achievement events | −.015 | −.931 | .847 | .022 | | |
| Step 4 | Autonomy * Achiev. Interaction | −1.171 | −2.042 | .043 | .024 | −.001 | .001 |

**Table 4** Hierarchical regression for variables predicting chronicity of depression ($N = 158$)

| | Variable | $\beta$ | $t$ | $p$ | $\Delta R^2$ | 95% CI for B | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower | Upper |
| Step 1 | Site | .218 | −2.850 | .005 | | | |
| | Baseline BDI | .241 | 3.130 | .002 | | | |
| | Prior Depression | .132 | 1.732 | .085 | .117 | | |
| Step 2 | Days in Study | −.075 | −.952 | .342 | .005 | | |
| *Sociotropy Subscales Analyses* | | | | | | | |
| Step 3 | Fear of Crit. & Reject | .308 | 4.040 | <.001 | | | |
| | Interpers. Events | .246 | 3.371 | .001 | .131 | | |
| Step 4 | F.C.R.*Interpers | −.400 | −1.516 | .132 | .011 | .000 | .000 |
| Step 3 | Fear of Crit. & Reject | .281 | 3.606 | <.001 | | | |
| | Achieve. Events | .166 | 2.279 | .024 | .102 | | |
| Step 4 | F.C.R.*Achieve. | .364 | 2.650 | .009 | .038 | .000 | .000 |
| Step 3 | Pref. for Affiliation | .141 | 1.859 | .065 | | | |
| | Interpers. Events | .242 | 3.184 | .002 | .069 | | |
| Step 4 | P.A.*Interpers Events | −.097 | −.310 | .757 | .001 | .000 | .000 |
| Step 3 | Pref. for Affiliation | .126 | 1.645 | .102 | | | |
| | Achieve. Events | .190 | 2.527 | .013 | .050 | | |
| Step 4 | P.A.*Achieve Events | −.102 | .325 | .746 | .001 | .000 | .000 |
| *Autonomy Subscale Analyses* | | | | | | | |
| Step 3 | Independ. Goal Attain. | −.094 | −1.184 | .238 | | | |
| | Interpers. Events | .248 | 3.212 | .002 | .058 | | |
| Step 4 | I.G.A.*Interpers Events | .516 | 1.548 | .124 | .013 | .000 | .000 |
| Step 3 | Independ. Goal Attain. | −.066 | −.827 | .409 | | | |
| | Achieve. Events | .194 | 2.566 | .011 | .039 | | |
| Step 4 | I.G.A.*Achieve Events | .504 | 1.690 | .093 | .016 | .000 | .001 |
| Step 3 | Sens. to Others Control | .280 | 3.105 | .002 | | | |
| | Interpers. Events | .180 | 2.439 | .016 | .087 | | |
| Step 4 | S.O.C.*Interpers Events | .186 | 2.246 | .026 | .026 | .000 | .000 |
| Step 3 | Sens. to Others Control | .204 | 2.540 | .012 | | | |
| | Achieve. Events | .190 | 2.496 | .014 | .035 | | |
| Step 4 | S.O.C.*Achieve Events | −.243 | −.550 | .583 | .002 | .000 | .000 |

predicted *less* severe episodes of depression ($t(155) = -3.509$, $P < .001$, $\Delta R^2 = .066$). When this significant interaction was decomposed via a median split of the two variables, intergroup comparisons (Tukey, $P < .05$) revealed that the high achievement event, low AUT: Independent Goal Attainment group experienced significantly more severe episodes of depression than the high achievement event, high AUT: Independent Goal Attainment group. See Fig. 1 for a representation of this interaction.

Finally in an effort to illustrate the clinical potential as well as statistical significance of these findings, median splits were used to further characterize the different numbers of depressive episodes experienced by high- versus low-scorers on the Bieling et al. (2000) subscales. First, a median split was used for both number of achievement events and scores on the SOC: Fear of Criticism and Rejection subscale. The low-event, low-fear group had a mean of 2.09 episodes across the 2.5 year follow-up period, whereas the high-event, high-fear group had a marginally higher mean of 3.03 episodes ($t(72) = 1.95$, $P = .056$). Another median split was used to examine the interaction between interpersonal events and the AUT: Sensitivity to Others' Control subscale. The low-event, low-sensitivity group experienced a mean of 1.84 depressive episodes across the follow-up period, while the high-event, high-sensitivity group experienced a mean of 3.40 episodes ($t(64) = 3.08$, $P = .003$).

Table 7 displays a summary of the findings from all analyses.

**Table 5** Hierarchical regression for variables predicting number of episodes ($N = 158$)

| | Variable | $\beta$ | $t$ | $p$ | $\Delta R^2$ | 95% CI for B | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower | Upper |
| Step 1 | Site | −.118 | −1.505 | .134 | | | |
| | Baseline BDI | .205 | | .010 | | | |
| | Prior Depression | .137 | 2.6011.755 | .081 | .076 | | |
| Step 2 | Days in Study | −.012 | −.150 | .881 | .000 | | |
| *Sociotropy Subscales Analyses* | | | | | | | |
| Step 3 | Fear of Crit. & Reject | .202 | 2.634 | .009 | | | |
| | Interpers. Events | .385 | 5.245 | <.001 | .166 | | |
| Step 4 | F.C.R.*Interpers | .146 | .544 | .587 | .002 | .000 | .001 |
| Step 3 | Fear of Crit. & Reject | .167 | 2.038 | .043 | | | |
| | Achieve. Events | .189 | 2.459 | .015 | .063 | | |
| Step 4 | F.C.R.*Achieve. | .339 | 2.404 | .017 | .032 | .000 | .001 |
| Step 3 | Pref. for Affiliation | .108 | 1.447 | .150 | | | |
| | Interpers. Events | .383 | 5.136 | <.001 | .142 | | |
| Step 4 | P.A.*Interpers Events | .299 | .973 | .332 | .005 | .000 | .001 |
| Step 3 | Pref. for Affiliation | .085 | 1.077 | .283 | | | |
| | Achieve. Events | .203 | 2.625 | .010 | .047 | | |
| Step 4 | P.A.*Achieve Events | .253 | .728 | .435 | .003 | −.001 | .003 |
| *Autonomy Subscale Analyses* | | | | | | | |
| Step 3 | Independ. Goal Attain. | −.092 | −1.179 | .240 | | | |
| | Interpers. Events | .391 | 5.174 | <.001 | .139 | | |
| Step 4 | I.G.A.*Interpers Events | −.159 | −.485 | .629 | .001 | −.001 | .001 |
| Step 3 | Independ. Goal Attain. | −.042 | −.508 | .612 | | | |
| | Achieve. Events | .206 | 2.650 | .009 | .041 | | |
| Step 4 | I.G.A.*Achieve Events | .046 | .149 | .882 | .000 | −.002 | .002 |
| Step 3 | Sens. to Others Control | −.047 | −.630 | .530 | | | |
| | Interpers. Events | .381 | 5.070 | <.001 | .134 | | |
| Step 4 | S.O.C.*Interpers Events | .321 | 3.814 | <.001 | .076 | .000 | .001 |
| Step 3 | Sens. to Others Control | −.043 | −.540 | .590 | | | |
| | Achieve. Events | .209 | 2.673 | .008 | .041 | | |
| Step 4 | S.O.C.*Achieve Events | −.427 | −.946 | .346 | .005 | −.003 | .001 |

## Discussion

This study provided an opportunity to expand current knowledge of the impact of sociotropic and autonomous cognitive personality styles on the course of depression. The use of a prospective longitudinal design afforded the ability to assess these cognitive personality characteristics before the onset of depression and ensured that their assessment was not affected by participants being in a depressed state; this addressed a serious limitation of previous studies. An additional benefit of this prospective study was the ability to track the course of depression as it occurred in real time without relying solely on retrospective self-reports. Importantly, the collection of detailed life events data throughout the study period allowed us to examine interactions between sociotropy or autonomy with the occurrence of domain-specific events (i.e., interpersonal- and achievement-related events, respectively) in relation to these course variables. Moreover, this study provided an opportunity to investigate factors hypothesized by Bieling et al. (2000) to underlie a sociotropic or autonomous mode (i.e., SOC: Fear of Criticism and Rejection, SOC: Preference for Affiliation, AUT: Independent Goal Attainment and AUT: Sensitivity to Others' Control) in interaction with specific classes of life events.

Contrary to our hypotheses, neither the sociotropy-interpersonal or autonomy-achievement event interactions were significantly associated with the number or duration of depressive episodes or the overall chronicity. Although the interaction between autonomy and the occurrence of achievement-related events was significantly associated with the severity of depressive episodes, the form of the

**Table 6** Hierarchical regression for variables predicting depression severity ($N = 156$)

| | Variable | $\beta$ | $t$ | $p$ | $\Delta R^2$ | 95% CI for B | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower | Upper |
| Step 1 | Site | −.191 | −2.483 | .014 | | | |
| | Baseline BDI | .283 | | <.000 | | | |
| | Prior Depression | .102 | 3.6541.336 | .184 | .120 | | |
| Step 2 | Days in Study | −.070 | −.884 | .378 | .004 | | |
| *Sociotropy Subscales Analyses* | | | | | | | |
| Step 3 | Fear of Crit. & Reject | .112 | 1.371 | .172 | | | |
| | Interpers. Events | .160 | 2.054 | .042 | .033 | | |
| Step 4 | F.C.R.*Interpers | .414 | 1.473 | .143 | .012 | .000 | .000 |
| Step 3 | Fear of Crit. & Reject | .120 | 1.401 | .149 | | | |
| | Achieve. Events | .173 | 2.370 | .023 | .022 | | |
| Step 4 | F.C.R.*Achieve. | .340 | 2.439 | .016 | .033 | .000 | .001 |
| Step 3 | Pref. for Affiliation | −.007 | −.083 | .934 | | | |
| | Interpers. Events | .155 | 1.975 | .050 | .032 | | |
| Step 4 | P.A.*Interpers Events | −.003 | −.010 | .992 | .000 | .000 | .000 |
| Step 3 | Pref. for Affiliation | −.016 | −.199 | .843 | | | |
| | Achieve. Events | .102 | 1.336 | .184 | .001 | | |
| Step 4 | P.A.*Achieve Events | .338 | 1.197 | .243 | .008 | .000 | .001 |
| *Autonomy Subscale Analyses* | | | | | | | |
| Step 3 | Independ. Goal Attain. | −.083 | −1.012 | .313 | | | |
| | Interpers. Events | .168 | 2.125 | .135 | .029 | | |
| Step 4 | I.G.A.*Interpers Events | −.503 | −1.474 | .143 | .012 | −.001 | .000 |
| Step 3 | Independ. Goal Attain. | −.101 | −1.333 | .189 | | | |
| | Achieve. Events | .165 | 2.295 | .049 | .022 | | |
| Step 4 | I.G.A.*Achieve Events | −.669 | −3.519 | .001 | .066 | −.001 | .000 |
| Step 3 | Sens. to Others Control | .232 | 3.088 | .002 | | | |
| | Interpers. Events | .137 | 1.799 | .074 | .003 | | |
| Step 4 | S.O.C.*Interpers Events | .277 | 3.209 | .002 | .056 | .000 | .000 |
| Step 3 | Sens. to Others Control | .246 | 3.225 | .002 | | | |
| | Achieve. Events | .027 | .362 | .718 | .057 | | |
| Step 4 | S.O.C.*Achieve Events | .176 | .402 | .688 | .001 | −.001 | .001 |

interaction was unpredicted; under high achievement stress, lower autonomy scores were associated with greater symptom severity. Moreover, neither sociotropy-achievement event nor autonomy-interpersonal event interactions significantly predicted any of the course indicators.

To help explain the puzzling autonomy-achievement event interaction predicting less severe episodes of depression, and to further explore the factors hypothesized to underlie sociotropy and autonomy for event-congruency effects, analyses of the four Bieling et al. (2000) SAS subscales, in interaction with the different life event categories, were conducted. AUT: Independent Goal Attainment was found to interact with achievement-related life events to predict less severe episodes of depression, such that individuals with a high number of achievement events who scored low on Independent Goal Attainment experienced significantly more severe episodes of depression than individuals who scored high on Independent Goal Attainment. This finding is consistent with the proposition that the Independent Goal Attainment factor of autonomy serves as a buffer against stress (Clark et al. 1995; Bieling et al. 2000). In the present study, individuals who did not have this protective factor (i.e., scored lower on AUT: Independent Goal Attainment) fared worse in the face of a high number of negative achievement-related life events—they had more severe episodes, whereas those with this protective factor did not.

Another pattern of results emerged from the analyses of the sociotropy and autonomy subscales. Namely, the SOC: Fear of Criticism and Rejection-by-achievement event and AUT: Sensitivity to Others' Control-by-interpersonal event interactions both significantly predicted a higher number of

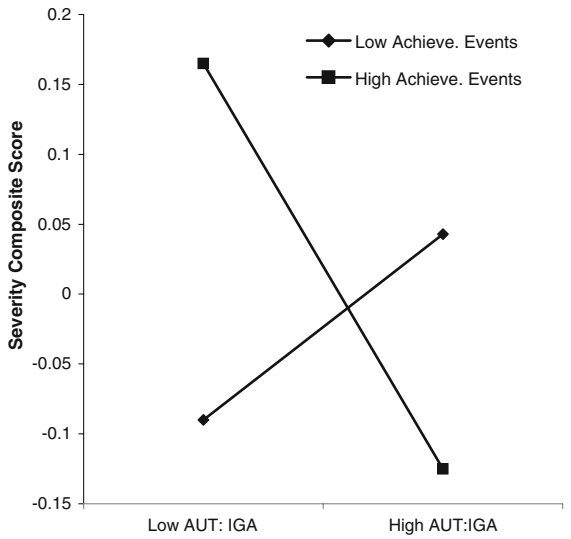


**Fig. 1** Severity of episodes (composite z-score for BDI and number of symptoms) as a function of achievement events and AUT:IGA

episodes, and episodes that were more severe and chronic in nature over the study period. In light of the event-congruency hypothesis, it appears that individuals who fear criticism and rejection react more strongly to negative achievement-related life events (e.g., failing a course or not getting a promotion at work) than individuals that do not fear criticism and rejection as much, in such a way that they experience a greater number of depressive episodes consisting of more symptoms (severity), and episodes that may not fully remit for some time (chronicity). The same appears to be true for individuals who score high on AUT: Sensitivity to Others' Control and experience a high number of negative interpersonal life events. Perhaps these individuals experience negative interpersonal life events (e.g., loss of a relationship, fight with a family member) as instances where another is exerting some amount of influence or otherwise "controlling" them in some way, which leads to the same constellation of depression course features as noted above; that is, more episodes of depression with greater severity and a more chronic nature.

Our results are consistent with some previous findings, including Robins and colleagues' (1997) suggestion that neither sociotropy nor autonomy is associated with the duration of episodes, and Clark and colleagues' (1995) and Bieling and colleagues' (2000) assertion that the Independent Goal Attainment factor of autonomy might serve as a buffer against stressors. This study highlights the importance of examining the event-congruency hypothesis when considering the effects of sociotropy and autonomy, or their subscales, on the course of depression. According to Beck's (1983) original theory, these cognitive personality dimensions are part of a vulnerability-stress model—they influence the generation of specific sets of life events and interact with them to predispose one to develop depression. Here we see that sociotropy and autonomy might not be associated with the course of depression in and of themselves, but the factors hypothesized to underlie these dimensions appear to influence the course that the disorder takes. However, these factors appear to interact with different sets of life events than one may expect; for example, sociotropy is presumed to interact with interpersonal life events, but the SOC: Fear of Criticism and Rejection subscale interacts with achievement life events in this sample. In addition, AUT: Sensitivity to Others' Control interacts with interpersonal events in spite of the conventional hypothesis that autonomy will interact with achievement-related events. These findings highlight the importance of investigating the factors underlying these cognitive personality characteristics when using the SAS to investigate the course of depression.

A potential limitation of the present study concerns the distinction between the statistical significance and clinical

**Table 7** Summary of significant results from hierarchical regression analyses

| | Course indicator | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Duration | | Chronicity | | Number of episodes | | Episode severity | |
| Sociotropy | | | | | | | | |
| Subscales: | | | | | | | | |
| Fear of Crit. & Reject. | | | | XX | | X | | X |
| Pref. for Affiliation | | | | | | | | |
| Autonomy | | | | | | | | X[a] |
| Subscales: | | | | | | | | |
| Independ. Goal Attain. | | | | | | | | XXX[a] |
| Sens. to Others' Control | | | X | | XXX | | XX | |
| | Interpers. | Achieve. | Interpers. | Achieve. | Interpers. | Achieve. | Interpers. | Achieve. |
| | | | Life event category | | | | | |

*Note*: X = $P < .05$; XX = $P < .01$; XXX = $P < .001$; [a] interaction predicted *less* severe episodes

potential of the findings. Although, as noted above, the interaction between cognitive personality style on the one hand and domain-specific life events on the other significantly and specifically predicted aspects of depressive course, the clinical significance of these results vis-à-vis the Bieling et al. (2000) subscales of sociotropy and autonomy may seem equivocal given the relatively small effect sizes. However, with respect to the example outlined in our results, consider this issue in the context of the number of depressive episodes experienced by participants. Analyses using median splits of the groups on both life events and SAS subscales suggested that these subscales may be associated with differences in the number of episodes experienced over the prospective follow-up period. For example, relative to participants falling below the median on both AUT: Sensitivity to Others' Control and negative interpersonal events, those falling above the median on both variables experienced nearly twice as many depressive episodes during the 2.5 year follow-up period. Stated another way, this difference constitutes more than one full depressive episode. Such differences may be clinically meaningful.

Another limitation of the current study was the inclusion of participants who had a prior history of depression. An ideal sample for this study would have consisted of participants with no history of depression, so that the first assessment of personality modes unequivocally would be devoid of impact from previous depression. Several measures were taken to avoid the possible influence of previous depression on the relation between personality and depression course indicators, including exclusion of participants with a depressive episode within the 2 months prior to entering the study, and inclusion of prior depression as a covariate in all analyses. Nonetheless, the possible effect of prior depression on the initial personality assessment cannot be discounted completely, as the proportion of participants experiencing depression before entering the study (94 of 159) was sufficiently large to prohibit excluding them and maintaining a sample large enough to run the analyses.

Finally, that the sample was chosen to include those individuals most and least cognitively vulnerable to develop depression limits the generalizability of the current findings to these groups. Only participants that were high or low on both the DAS and CSQ were studied, and as such, conclusions about individuals in the mid range of these scales are interpolations. Corroboration of the present findings with an unselected longitudinal sample, or possibly with a sample selected for SOC/AUT extreme scores, would be an important direction for future research.

In sum, factors hypothesized by Bieling and colleagues (2000) to underlie sociotropy and autonomy as measured with the SAS (i.e., SOC: Fear of Criticism and Rejection and AUT: Sensitivity to Others' Control) interact with achievement-related and interpersonal life events, respectively, to predict an increased number of depressive episodes that are more severe, as well as a more chronic course of the disorder. It is noteworthy that the autonomy subscale of Independent Goal Attainment appears to serve as a protective factor in its interaction with achievement-related life events to predict the severity of depression—in the face of a high number of achievement-related life events, those with low Independent Goal Attainment had more severe episodes of depression than those with high scores on the subscale. The protective nature of this feature of autonomy, representing independence and self-determination, has been suggested elsewhere (Clark et al. 1995; Bieling et al. 2000). So, this finding was anticipated by and is consistent with previous literature, and supports the notion that AUT: Independent Goal Attainment should be considered a protective factor against certain stressors. It also further supports the rationale for investigating the lower-level factors underlying sociotropy and autonomy, as neither of these global scores interacted with domain-congruent life events to predict course indicators in the hypothesized directions (one significant interaction was elucidated, but in the direction opposite to predictions, which was then explained by the AUT: Independent Goal Attainment-by-achievement event interaction). Furthermore, that the sociotropy and autonomy subscales interacted with domain-incongruent life events to predict the same constellation of course indicators, contrary to Beckian (1983) theory, supports the importance of investigating these and other hypothesized subscales of the broader cognitive personality factors of sociotropy and autonomy. Such associations between cognitive personality characteristics and depressive course may have important, clinically meaningful implications for both intervention and prevention efforts. As such, future research is certainly warranted in order to both replicate the present findings and to more fully evaluate the clinical significance of the associations reported here.

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