Published in final edited form as:

J Pers. 2017 August ; 85(4): 553–564. doi:10.1111/jopy.12260.

Combining Stress Exposure and Stress Generation: Does Neuroticism Alter the Dynamic Interplay of Stress, Depression, and Anxiety Following Job Loss?

George W. Howe,

George Washington University

Maria Cimporescu,

George Washington University

Ryan Seltzer,

Mayo Clinic, Scottsdale

Jenae Neiderhiser,

Pennsylvania State University

Francisco Moreno, and

University of Arizona

Karen Weihs

University of Arizona

Abstract

Objective—Emerging models of stress point to a dynamic formulation where stressors and internalizing symptoms reciprocally influence each other. This study tested whether this dynamic interplay is the result of a general internalizing process underlying both depression and anxiety, and whether it varies with neuroticism.

Method—426 adults (51% female, 47% White, 42% African American) were assessed 5 times over 6 months following loss of employment, using repeated measurements of stressors, depression, anxiety, and neuroticism.

Results—Latent growth across 6 months and multilevel cross-lagged regressions across 6 weeks supported the hypothesis that stressors and internalizing symptoms have reciprocal effects after job loss. Findings for unique variation in depression paralleled those for general internalizing, while few findings emerged for general or social anxiety after controlling for internalizing. Neuroticism strengthened the association of change in stressors with change in symptoms across 6 months.

All inquiries concerning the paper can be directed to George W. Howe, Department of Psychology, GWU, 2125 G Street NW, Washington, DC 20052.

George W. Howe and Maria Cimporescu are in the Department of Psychology at the George Washington University, Washington, DC. Ryan Seltzer is at the Mayo Clinic, Scottsdale, Jenae Neiderhiser is in the Department of Psychology at the Pennsylvania State University, and Francisco Moreno and Karen Weihs are in the Department of Psychiatry at the University of Arizona.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Those with high neuroticism showed less reduction in internalizing following re-employment, and were less likely to be re-employed when starting with higher internalizing.

Conclusions—The moderated reciprocal effects model helps account for onset, maintenance, and resolution of symptoms following job loss. We speculate that these findings may be due in part to differential emotion regulation and reductions in motivation.

Keywords

Stress effects; stress generation; unemployment; internalizing; neuroticism

Models of stress and internalizing disorders have become more complicated in recent years: substantial earlier research demonstrating that stressful events often trigger symptoms of depression and anxiety has been supplemented by findings that depression and perhaps anxiety can increase future exposure to stressful events. This leads to a dynamic picture, suggesting that stressors and internalizing responses reciprocally influence each other. There is also growing evidence that depression and anxiety commonly co-occur, such that variation in these two types of symptoms can be partitioned into that which is common to both, and that which is unique to each. This raises the question of whether dynamic interplay between stressors and symptoms is the result of a more general mechanism underlying both anxiety and depression or is due to some mechanism that is unique to one or the other. In addition, research suggests that the dynamic interplay of stressors and internalizing may operate in different ways for different people. Diathesis-stress perspectives have been used to guide research on differential response to stressors, but are only now being applied to more dynamic formulations of stressors and internalizing.

In this paper we use data from a longitudinal study of 426 recently unemployed individuals to address three questions concerning stress and internalizing. Is there evidence for reciprocal effects between stressors and internalizing across the 7 months following job loss? Are dynamic associations between stressors and symptoms found for a more general internalizing factor, or are they found only for unique depression or unique anxiety? And finally, do dynamic associations between stressors and symptoms vary according to levels of stable neuroticism?

The Dynamics of Stress and Internalizing

Substantial research supports the *stress exposure hypothesis* that stressful life events including those associated with job loss contribute to the onset of depression and anxiety. Paul and Moser (2009), in a recent meta-analysis of 324 studies, found significant associations between job loss and a range of internalizing measures in both cross-sectional studies and longitudinal studies. Re-employment was associated with subsequent reductions in symptoms ($d = -.29$), suggesting a corollary hypothesis that cessation of stressful conditions can lead to resolution of symptoms generated by continuing stress exposure. Price, Friedland, & Vinokur (1998) suggested that job loss is not only a stressful event by itself, but also ushers in a series of cascading stressful events over the ensuing period of unemployment, driven by loss of income.

Contemporaneous correlations of unemployment status and internalizing symptoms are likely to conflate the effects of stressors on internalizing with any effects that internalizing may have on the occurrence of subsequent stressors. Hammen (1991) referred to the latter effect as *the stress generation hypothesis*. Liu and Alloy (2010) reviewed two decades of research on this topic, finding substantial evidence that both depressive episodes and depressive symptoms were associated with future stressful life events. There is also evidence that anxiety can contribute to future stressful events. Conway, Hammen, and Brennan (2012) found that both general internalizing and unique disorder-specific variance were associated with subsequent stressors.

We have been unable to locate any studies of stress generation following job loss. Such effects may be likely, given that unemployed individuals face many challenges, and negative mood can easily have an impact on how they approach those situations. We therefore hypothesize that stressors occurring after job loss will be dynamically associated with internalizing symptoms, with each contributing to the exacerbation of the other.

Studying Dynamics at Different Time Scales

Although internalizing and stressors may reciprocally affect each other, the timing of these effects may differ. Daily diary studies find that depressive symptoms can increase in as little as a day following exposure to stress (Bolger & Zuckerman, 1995). However, the effects of stressful events appear to decay over time. Brown and Harris (1978) found that increased risk for major depressive episodes following a single severe event disappeared within 9 weeks. These effects appear to vary by type of event. Kendler, Karowski, and Prescott (1998) found that severe events including loss of employment increased risk for major depression and generalized anxiety only in the month following the event. Events that were less delimited, including ongoing financial and work problems were associated with subsequent depression as long as four months later.

There is less evidence available concerning the time course of stress generation. Sahl, Cohen, and Dasch (2009), in a daily diary study, found that sadness was associated with both dependent and independent stressors, but this association disappeared when controlling for hostility. Given that depression is often accompanied by irritability and expression of anger, this component may be more strongly implicated in generation of subsequent stressors. Longitudinal studies with longer follow-up periods have consistently found that depression at one time predicts increases in stressful events over subsequent periods from five weeks (Joiner, Wingate, Gencoz, & Gencoz, 2005) to 12 months (Brown & Rosellini, 2011).

Based on these findings, we hypothesize that both stress exposure and stress generation effects would occur at both shorter and longer time scales in the period following job loss. We used multilevel growth models to test for effects across six months, and multilevel autoregressive and latent change models to study effects across six weeks.

The Topography of Stress Following Job Loss

The nature of the job loss event itself can vary widely; some employers blame the employee for poor performance, while others attribute the firing to down-sizing. Some individuals find

new employment relatively soon, while others remain unemployed for long periods. In this study we focused on three aspects of stress exposure that could influence onset, maintenance or exacerbation, and resolution of internalizing responses. Using the contextual framework developed by Brown and Harris (1978), we identified a number of elements of the job loss itself that were likely to increase its impact. These included loss of resources such as income, benefits, and health insurance; the unpredictability and uniqueness of lay-off; and evidence of career derailment. We hypothesized that exposure to more of these elements would lead to the onset of stronger internalizing reactions in the first few weeks after job loss.

We also focused on exposure to moderate and severely stressful events that emerged after job loss. Howe, Levy, and Caplan (2004) found that moderate events were associated with more depressive symptoms soon after job loss, and Kendler et al. (1998) found associations of mild to moderate work-related and financial events with onset of depressive episodes up to four months later. We assessed the onset of new severe life events in the areas of finances and housing following job loss. We hypothesized that both moderate and severe events could have both immediate effects and effects that maintained or exacerbated symptoms over the course of time.

There is substantial evidence that re-employment resolves internalizing symptoms (Paul & Moser, 2009). This may, however, depend on the quality of re-employment. Ginexi, Howe, and Caplan (2000) found reductions in depressive symptoms only for those who gained full-time, permanent re-employment (as compared to part-time or temporary re-employment) during the first six months after job loss. Monfort, Howe, Nettles and Weihs (2015) replicated this effect across 7 months for job seekers who had originally had a full-time job. We therefore included an assessment of re-employment status at each time point, allowing us to test the hypothesis that re-employment would lead to symptom resolution both immediately and over time.

Common and Unique Contributions of Depression and Anxiety

Depression and anxiety co-occur frequently and may reflect manifestations of a broader internalizing process which can also include irritability and anger (Lahey et al., 2012). We previously reported multilevel growth analyses on this data set demonstrating that growth trajectories for depressive symptoms, social anxiety, and general worry were strongly correlated and allowed for modeling a higher-order internalizing factor reflecting common change in symptoms over six months (Howe, Hornberger, Weihs, Moreno, & Neiderhiser, 2012). This approach also allowed us to separate symptom slope variance into that which is common across all symptom sets and that which is unique to depression or anxiety. There is evidence that the general internalizing factor and the symptom-specific unique factors may reflect different etiologic mechanisms. Lahey, Van Hulle, Singh, Waldman, & Rathouz (2011), applying behavioral genetic analysis to latent variable models of child and adolescent psychopathology, found that depression and generalized anxiety disorder were both associated with the same additive genetic and non-shared environmental factors, but social anxiety was associated only partially with these additive genetic factors and was associated with completely unique non-shared environment.

Studies of job loss suggest that unemployment stressors may have effects that are both general and domain-specific. Kendler, Prescott, Myers & Neale (2003) found that major depressive episodes followed events involving loss or humiliation, while anxiety followed events involving loss or danger. These findings suggest that stressors associated with job loss may differentially impact common internalizing and the unique variance in depressive and anxiety symptoms. Given the substantial general threat accompanying job loss, we hypothesize that the severity of the job loss event and exposure to subsequent stressors will increase risk for general internalizing, both immediately after job loss and over the months following. Both symbolic and actual losses that follow job loss, as well as the potential for experiencing humiliation and interpersonal conflict, will in addition contribute to unique depressive response. Predictions concerning anxiety are less clear. Kendler et al. (2003) found that generalized anxiety reactions were most common following events involving physical danger, but were also associated, albeit more weakly, with loss events. However, depression was only partially controlled in this research, such that subclinical levels of depression could have contributed to findings for generalized anxiety. Therefore, we hypothesize that job loss will have no impact on anxiety symptoms after controlling for variance common to depression.

Stress generation may also differ for common and unique symptoms. Conway et al. (2012) recently tested this thesis in an early adult sample, using latent variable models to distinguish a common internalizing factor from variance uniquely associated with specific disorders including both depression and anxiety. The common internalizing factor was associated with interpersonal dependent stress. Unique variance in depression was associated only with interpersonal dependent stress and generalized anxiety disorder and social anxiety disorder were not associated with subsequent stress. Based on these findings we hypothesize that common internalizing and unique depression will contribute to subsequent moderate and severe stressors in the period following job loss, but general anxiety and social anxiety will not.

Neuroticism as a Moderator of the Dynamic Model

Dynamic interplay between internalizing and stressors may also be shaped by personality factors. Neuroticism, defined as the tendency to react negatively to unpleasant or threatening environmental stimuli (Ormel et al., 2013), is most strongly and consistently associated with depression and anxiety (Kotov, Gamez, Schmidt, & Watson, 2010). Neuroticism can moderate the impact of moderate stressors or ongoing adversities on internalizing responses (Brown & Rosellini, 2011; Ormel & Wohlfarth, 1991). Findings are more inconsistent for severe stressors. Kendler et al. (2004) found support for moderation, while other studies of severe stressors failed to do so (Ormel & Wohlfarth, 1991). Severe stressors may have pathogenic effects regardless of vulnerability, while moderate stressors may have an impact only for those who are more reactive.

The role of neuroticism on stress resolution is also unclear. Those higher in neuroticism may be more sensitive to reduction in stressors and demonstrate faster resolution, or they may be more sensitive to the effects of prior stressors, leading to slower symptom resolution. We

make no predictions concerning differential rates of resolution, but do test for possible effects.

The moderating effects of neuroticism appear to differ for depression and anxiety, with stronger and more consistent effects for the former than the latter. Neuroticism may moderate the impact of stressors on general internalizing and unique variance in depressive symptoms, but not in unique anxiety, although we have been unable to locate any studies testing this thesis.

Although a number of stress generation studies have assessed neuroticism, we were unable to locate studies that tested whether neuroticism moderates the impact of internalizing on subsequent stressors. We therefore make no predictions concerning the moderating effects of neuroticism on generation of stressors following job loss, although we do test for such effects.

Stress generation research does, however, suggest two alternative hypotheses. It is possible that neuroticism itself increases risk for subsequent stressors, which in turn shape future internalizing reactions. Given that neuroticism is associated longitudinally with both subsequent stressors and subsequent internalizing, it is also possible that the association between stressors and internalizing is spurious, with both being driven by neuroticism. We include tests of these two alternative models.

The Current Study

In this study we used longitudinal data from a sample of recently unemployed adults to test a dynamic model that integrates stress exposure and stress generation processes as they play out over the 7 months following job loss. We tested whether this dynamic model operates differently for a general internalizing response as compared to unique components of depression, general worry, and social anxiety, and whether effects were moderated by neuroticism.

Method

All procedures were reviewed and approved by the George Washington University IRB.

Participants & Recruitment

We recruited the sample from a state-wide database which included rural, suburban and urban areas, allowing us to recruit individuals of varying ethnicities, ages, and both genders. We also oversampled African-American males in order for our final sample to have relatively equal numbers of males and females and of African-American and White participants.

Potential participants resided in one of six Maryland counties in the greater Baltimore-Washington, D.C. metropolitan area. We collaborated with the Maryland Department of Labor, Licensing, and Review to send out letters describing the study to a random sample of all individuals applying for unemployment insurance within the last week. Those interested in the study participated in an eligibility screening. Eligibility criteria included: a)

unemployed for no more than 42 days at the time of first interview; b) had not been offered or received a new job or were not working in any job for more than 19 hours per week; c) did not quit previous job; d) had been laid off permanently; e) was not planning to retire in next two years; f) lost job was not seasonal; and g) able to speak and read English. Over a period of 22 months, 1,056 people were screened and 643 individuals met eligibility criteria. Eligible individuals were given a short description of the study and invited to participate in an interview in or near their home. Of those eligible, 217 did not participate; 82% of these because interviewers were unable to schedule within the required time frame or the individual had found employment prior to the interview.

The final sample consisted of 426 individuals, including 220 women and 206 men ranging in age from 19 to 81 (mean age = 46). Of these 47% were White, 42% African American, 6% more than one race, 2% Hispanic, and 3% unknown or other. On average, participants had completed 14.4 years of education ($SD = 2.64$), ranging from 8 to 20 years. Around 28% of participants lived alone, 24% lived with other adults, 19% lived only with a spouse or partner, and 29% lived with children. Median household income was \$63,000 before job loss, and \$17,000 after, with 38% of the sample reporting no income after job loss. Based on 2008 weighted average poverty thresholds (U.S. Census Bureau, 2010), 6% of participant households were below poverty line before job loss, with 51% of the sample below poverty threshold after.

Data Collection

Participants completed five interviews over several months following loss of employment. The initial interview took place in person, generally in the home of the participants; follow-up interviews were conducted by telephone. Time 2 interviews were scheduled 12 weeks after the date of job loss, and the remaining interviews were scheduled every 6 weeks. Eighty-five percent of the participants completed the Time 2 interviews, 74% the Time 3 interview, 72% the Time 4 interview, and 88% the Time 5 interview. Participants were compensated \$15 per hour.

Measures

The initial interview encompassed a broad range of variables for characterizing the job loss event and subsequent economic and housing conditions, as well as assessments of personality factors. Mood and anxiety symptoms were assessed through questionnaire and through diagnostic interviews. Participants also provided saliva samples for analysis of DNA.

In this report we focus on data from measures of internalizing symptoms (depression, social anxiety, and worry), exposure to stressors, and neuroticism. These measures were administered on laptops via computer-assisted programming during the in-home interview. During telephone follow-ups these measures were administered verbally by the interviewer.

Depression symptoms—To measure depressive symptoms, we used an abbreviated version of the Center for Epidemiological Study Depression Scale (CES-D) which was developed to measure symptoms of depression in the general population (Radloff, 1977). We

administered the full 20-item measure during the first wave of data collection, and a shorter 12-item version at each of the four subsequent waves. Time one total scores for the full and abbreviated versions of the measure were correlated .98, indicating excellent comparability. Only the shorter version was used in the analyses for this study for all five waves. Previous research has also used abbreviated versions of this scale. Cole, Rabin, Smith and Kaufman (2004) validated a 10-item version of the CES-D, which demonstrated a wide range of depressive severities and measured all aspects of the theoretical construct found in the full form. In this study, we used all ten items used by Cole et al. (2004) and included two additional items, “I felt depressed” and “I felt sad,” in order to be able to compare findings to those from other studies using this set of 12 items in unemployment samples (Howe et al., 2004). Consistent with previous research, in this sample we found Cronbach’s alpha ranging from 0.75 to 0.89 for waves 1 through 5 for our abbreviated scale.

Chronic worry symptoms—The 16-item Penn State Worry Scale was used to assess general levels of worry (Meyer, Miller, Metzger, & Borkovec, 1990). This measure has shown high internal consistency and good test-retest reliability (Meyer et al., 1990). It has been used to reliably distinguish cases of Generalized Anxiety Disorder (GAD: Behar, Alcaine, Zuellig & Borkovec, 2003) and as an index of symptom change in clinical trials of interventions for GAD (e.g. Katzman et al., 2008). Cronbach’s alphas ranged from 0.75 to 0.88 in this study.

Social anxiety symptoms—We used the 18-item Brief Social Phobia Scale (BSPS) as a measure of social anxiety (Davidson et al., 1997). The BSPS has shown high levels of reliability and validity, as well as test-retest reliability and internal consistency (Davidson et al., 1997). It has been used to reliably distinguish subjects with Social Anxiety Disorder from subjects with subthreshold levels of SAD and control groups (Filho, et al., 2009). Cronbach’s alphas ranged from 0.92 to 0.95 in the current study.

Contextual stress interview—At each wave of data collection, a semi-structured interview was used to assess the specific nature and context of the job loss event and changes in finances, housing, and employment activities in the months after job loss. The interview was an adaptation of the Structured Life Events Inventory (SLI; Wethington, 1997), which allows for systematic contextual rating of level of threat for each significant event. All interviews were audio recorded. A separate team, extensively trained on methods for systematic extraction of information, prepared written accounts of each event from the audio recording, including information about the nature of the occurrence, its duration, and its consequences.

Severity of Job Loss Index (SJLI)—We assessed severity of the job loss event itself using data from questionnaire items on financial changes, and from the contextual stress interview. Based on criteria from the Life Events and Difficulties Schedule (LEDS; Brown & Harris, 1978), we identified a number of specific sources of threat that would increase the stressful nature of the job loss. Five sources of threat (percentage of household income lost, amount of notice, loss of benefits other than health insurance, first time being laid off, and lack of severance pay) were evaluated through single questionnaire items.

The remaining sources of threat (loss of health insurance, unpredictability of lay-off, evidence that termination is due to the individual's behavior, career derailment, loss of seniority, devaluing messages and hostility during lay-off, uniqueness, personal circumstances making reemployment more difficult, loss of identity, loss of important social support system) were evaluated through content coding of written accounts of interview responses. We developed a detailed coding manual (available from the first author), and trained a set of coders to criterion. Transcribed event descriptions were then randomly assigned to pairs of coders in weekly batches. Given that different sources of threat used different rating scales, we rescaled all ratings to a common metric. Scores from all sources were then added together to create a single measure of severity of initial job loss threat. Inter-rater agreement on this summary score (based on ratings made prior to reconciliation) was high (Chronbach alpha = .81).

Post-Job-Loss Events (PJLEI)—Information from the Contextual Stress Interview was scored by a team of two raters to quantify the impact of economic, employment, and housing events that occurred after job loss, using the Life Events and Difficulties Schedule (LEDS) Dictionary (Brown & Harris, 1978). This manual outlines explicit rules and criteria for rating severity of specific stressful events, and includes a set of examples from prior studies. We used principles from the LEDS system to develop an expanded set of examples in the area of employment stressors (available from the first author).

The LEDS coding system employs a 4-point rating system for severity and the second highest category (moderate) is often broken into two categories of low moderate (2a) or high moderate (2b), creating five categories. We converted this to a five-point system with reversed the scaling such that higher scores indicated more severe threat. Thus events were coded using a scale of 1 (*limited or no threat*) to 5 (*severe threat*). All events were rated by both raters and any disagreements between the two raters were reconciled by consensus. Inter-rater agreement was determined pre-reconciliation and was acceptable, with a weighted kappa coefficient of 0.68.

A substantial number of our participants had no codeable events for the prior 6 weeks at each wave (T1=70%, T2=26%, T3=60%, T4=48%, T5=48%), while a few participants had two or more events. We used the severity score of the highest rated event at each wave as an index of threat from financial, housing, or employment events during that period. Scores on this measure ranged from 0 (no events reported) to 5 (at least one severe event reported).

Post-job-loss Stressors Questionnaire (PJLSQ)—We also used a checklist of stressful events (Howe et al., 2004) to evaluate stressors occurring after the job loss. This measure includes 51 events in five categories: income supplementation, restrictions in spending and increased debt, change in routines, new demands for job search and training, and physical relocation. Job seekers rate the occurrence of each event as having occurred or not occurred since job loss for the T1 assessment, or since the prior assessment for T2 through T5 assessments. Data from this measure was collected at all five waves. Earlier studies have found strong convergence with reports of life events by significant others, and evidence that the measure is predictive of depressive symptoms following job loss (Howe et al., 2004). Scores on this measure were created by summing the number of endorsed events.

Re-employment—Interviewers administered a semi-structured interview to assess current employment status at waves 2 through 5. Data from this interview allowed for defining three re-employment conditions: unemployed, partially employed (under 20 hours per week and/or temporary) or fully employed.

Neuroticism—We used the 12-item neuroticism subscale from the NEO Five-Factor Inventory (Costa & McCrae, 1997) to assess dispositional neuroticism. Murray, Rawlings, Allen, and Tinder (2003) found strong Internal consistency and test-retest stability over 30 months for this index, and it has demonstrated moderation effects with life stressors (Brown & Rosellini, 2011). Because scores on neuroticism measures can be influenced by current conditions, we administered the questionnaire three times, at waves 1, 3, and 5. We combined these three scores into a single index of trait neuroticism using latent trait modeling (see supplementary materials for a description of this approach).

Data Analytic Strategy

We conducted all analyses using MPLUS Version 7.1 (Muthén & Muthén, 1998–2010). Given that symptom data were somewhat skewed, we used the MLR estimator to produce robust standard errors, and both FIML and multiple imputation to deal with missing data (see supplementary materials for details).

Results

Internalizing Onset

We specified a latent variable model for general internalizing using T1 measures of depressive symptoms, generalized worry, and social anxiety as indicators, and regressed this latent variable on the severity of job loss event, using multiple imputed datasets. This model also included a set of covariates to control for potential confounding: age, education, gender, ethnicity, income prior to job loss, employment status prior to job loss, and neuroticism. Severity of the job loss event was significantly associated with internalizing ($B = .402$, $SE B = .168$, $p < .02$, $\beta = .091$), consistent with the stress effects hypothesis. We then added a variable carrying information about the interaction of the severity measure with neuroticism. The parameter for this term was not significant, failing to support the sensitization hypothesis.

Internalizing Maintenance or Exacerbation

Growth models across all waves—In preliminary analyses we estimated growth models for internalizing and each unique symptom (depression, general anxiety, social anxiety). For the continuous measure of post-job-loss stressors we estimated a growth model with intercept, linear growth, and quadratic growth latent variables. Details are available in supplementary materials.

We used parallel growth models to test whether internalizing trajectories were associated with change trajectories in post job-loss stressors by allowing latent slopes for internalizing and stressors to correlate. This model also controlled for covariates as well as for both latent intercepts. Preliminary analyses found intercepts to be correlated with slopes (for

internalizing: $r = -0.515$, $SE = .066$, $p < .0001$; for PJLSQ: $r = -0.566$, $SE = .095$, $p < .0001$), such that including them as covariates in these regressions controlled for historical factors influencing levels of symptoms and stressors at the beginning of the study. The association between slopes of internalizing and post-job-loss stressors was strong and significant ($B = .336$, $SE B = .051$, $p < .001$; $\beta = .758$), with more positive slopes in internalizing associated with more positive slopes in stressors, consistent with both the stress effects and the stress generation hypotheses.

In order to test whether this association varied by level of neuroticism, we specified a model where internalizing slope was regressed on the post-job-loss stressors slope, as well as on a term indexing the interaction of the stressor slope with neuroticism using the XWITH function in MPLUS that allows for interactions between latent and manifest variables. The moderator term was significant ($b = .803$, $SE = .314$, $p < .01$), indicating that the positive association between the internalizing slope and the stressor slope was stronger for those higher in neuroticism, consistent with the sensitization hypothesis.

We attempted to specify similar models for the measure of contextual severity of post-job-loss events. This measure was severely skewed, with a substantial percentage of participants reporting no life events at each time period. As a result, growth models with this variable proved impossible to estimate. We therefore created a summary score for the contextual severity measure by summing the contextual severity scores for all events for each of the five waves, and used this as an estimate of stressor severity across the 6-month period, regressing the internalizing slope on this measure along with covariates, neuroticism, and internalizing intercept. Higher summary scores were associated with more positive or less negative internalizing slopes ($B = .060$, $SE B = .014$, $p < .001$; $\beta = .250$), consistent with both stress exposure and stress generation effects. We also calculated severity scores based on the number of six-week periods that included at least one severe event (> 3 on 1–5 scale). These were infrequent: 91% of the sample reported no severe events over 6 months, 7.3% reported one event, 1.4% reported two events, and 0.3% reported 3 events. This more stringent severity score was also associated with more positive or less negative internalizing slopes ($B = .352$, $SE B = .125$, $p = .005$; $\beta = .164$). There was no evidence that neuroticism moderated either association.

Cross-lagged regression models—Overall, growth analyses were consistent with both the stress effect and stress generation models, as well as with the sensitization hypothesis, for the post job-loss stressor questionnaire. These analyses cannot however distinguish between stress effect and stress generation, given that the two growth processes occur across the same period of time, with no temporal priority. We therefore turned to cross-lagged regression models to test for temporal priority in associations between stressors and symptoms. We used a multilevel modeling approach that allowed us to combine data across five waves in order to increase power to detect effects. To index change in internalizing we used latent change scores, and to index change in individual symptoms we used autoregressive models. A detailed description of these methods is available in supplementary materials.

We used a step-down strategy to test hypotheses concerning maintenance or exacerbation of internalizing for each of the two measures of stress (post-job-loss stressors, severe life events). We first specified a complete model that included interaction terms to test whether neuroticism sensitized participants to both stress exposure and stress generation. If these were not significant, we then respecified models without those terms, in order to test for simple effects.

Post job-loss stressors—In all models that included post job-loss stressors, parameters for interactions with neuroticism were not significant, providing no support for the sensitization hypothesis. The simple effect model for internalizing supported both the stress exposure (for change in internalizing on stressors_{*t-j*}: $B = .034$, $SE B = .016$, $p < .05$, $\beta = .076$) and stress generation (for stressors_{*t+1*} on internalizing: $B = .220$, $SE B = .061$, $p < .001$, $\beta = .170$) hypotheses. Exposure to more stressors reported at one time point was associated with increase or less decrease in internalizing across the subsequent six-week period, and higher levels of internalizing at the first time point were associated with increase or less decrease in stressors.

Post job-loss contextual severity—We followed a similar strategy for testing hypotheses concerning event severity. There was no support for the stress effects or stress generation model, and no evidence for the sensitization hypothesis.

Internalizing Resolution

We next specified models to test the hypothesis that re-employment would contribute to subsequent reduction in symptoms, as well as the reciprocal hypothesis that symptom levels would influence likelihood of re-employment. To study whether growth in symptoms and change in employment status were associated across the six-month period, we used latent class analysis to determine patterns of change in employment status (unemployed, partially employed, fully employed). Based on the parametric bootstrapped likelihood ratio test and substantive theory, we selected a five class solution. These included a stably unemployed class (45%), and four classes that regained stable employment (Class 2, fully employed by T2: 13%; Class 3, full employed by T3 or T4: 17%; Class 4, partially employed by T2: 14%; Class 5, partially employed by T3 or T4: 12%.) Entropy was high ($E = .935$), indicating excellent class separation.

Given the high entropy and strong discrimination among classes, we used MPLUS estimates of probable class membership to construct dummy codes for each of the four re-employment classes, contrasting them with the stable unemployment class. We regressed the internalizing slope on those dummy variables, including parameters for the interaction between each dummy code and neuroticism. The model also included neuroticism, demographic covariates, and the internalizing intercept as control variables. Results are summarized in Table 1. All of the interaction terms were significant. Inspection of predicted internalizing mean slopes (illustrated in Figure 1) indicated that all forms of re-employment were associated with reductions in internalizing. However, neuroticism moderated the association between re-employment and internalizing, such that re-employment was associated with

greater reductions in internalizing for those higher in neuroticism compared to those lower in neuroticism.

We used two-level cross-lag regression models to test both stress resolution and stress generation hypotheses across a six-week timeframe. This included an autoregressive model for re-employment. We used multinomial regression to regress employment status at time $t+1$ as a three-category variable (none, partial, full) on previous employment status indexed with two dummy variables with unemployment as the contrast category, as well as on internalizing at time t . We employed a latent change score model for internalizing, similar to that used in analyses of post-job-loss stressors described earlier.

Results summarized in Table 2 supported a reciprocal effects model, and both effects appeared to be moderated by neuroticism. In contrast to the 6-month growth models, re-employment was followed by steeper reductions over 6 weeks in internalizing symptoms for the low neuroticism as compared to the high neuroticism participants, congruent with the thesis that neuroticism reduces rates of symptom resolution. In addition, higher internalizing in the previous period was associated with lower rates of full (but not partial) re-employment, and this association was stronger for those higher in neuroticism, congruent with the thesis that neuroticism increases rates of stress generation.

Effects on Unique Symptom Variance

We used similar analyses to study onset, maintenance or exacerbation, and resolution of each individual symptom measure (depression, social anxiety, general anxiety), controlling for variance held in common across these measures, using statistical models described in detail in supplementary materials.

For unique depression, we found no significant effects for severity of job loss. Autoregressive models of unique depression on post-job-loss stressors supported both stress exposure (for depression _{$t+1$} on stressors: $B = .104$, $SE B = .025$, $p < .001$, $\beta = .108$) and stress generation (for stressors _{$t+1$} on depression: $B = .224$, $SE B = .036$, $p < .001$, $\beta = .211$), but neither effect was moderated by neuroticism. Autoregressive models with post-job-loss severe events supported the stress generation thesis for unique depression (for severity _{$t+1$} on depression: $B = .024$, $SE B = .006$, $p < .001$, $\beta = .179$), but no other effects were significant. Models with re-employment variables indicated that unique depression symptom resolution was moderated by neuroticism (for full time employment: $B = 0.195$, $SE B = .074$, $p = .008$, $\beta = .064$; for part time employment: $B = 0.156$, $SE B = .088$, $p = .075$, $\beta = .049$). Those higher on neuroticism showed less reduction in depression following both partial and full re-employment, suggesting neuroticism decreases resolution of unique depression. Higher unique depression was associated with lower likelihood of subsequent full but not partial re-employment ($B = -.044$, $SE B = .022$, $p < .05$, $\beta = -.192$), consistent with the stress generation hypothesis. Overall, unique depression was most consistently involved in stress generation, with neuroticism moderating these effects only for re-employment.

For unique general anxiety, we found no significant effects for severity of job loss. Autoregressive models for unique general worry failed to support the stress exposure thesis and were contrary to the stress generation thesis, with higher levels of worry at time t

associated with reduced post-job-loss stressors at $t+1$ (for stressors _{$t+1$} on worry: $B = -.038$, $SE B = .016$, $p < .05$, $\beta = -.060$). We found no significant effects for post-job-loss severe events. Change in unique worry was associated with full but not partial employment in the following 6 weeks: contrary to the symptom resolution thesis, full re-employment was followed by an increase in unique general worry ($B = 1.050$, $SE B = .505$, $p < .05$, $\beta = .073$). In this one instance one-level models indicated that these effects varied over wave ($Wald(4) = 11.910$, $p < .02$), with the effect only significant for change in worry between T3 and T4 ($B = 2.805$, $SE B = 1.125$, $p < .02$, $\beta = .195$). There was no evidence that neuroticism moderated any of these effects.

There were no significant effects for unique social anxiety for any of these analyses.

Discussion

This study is one of the first to assess both stress response and stress generation within a dynamic framework. Findings at both 6 month and 6 week time scales supported our hypothesis that stressors and internalizing symptoms have reciprocal effects in the aftermath of job loss, and partially supported the thesis that these effects would vary due to neuroticism. The contextual severity of stress from the job loss itself was associated with general internalizing soon after job loss, an association that was not affected by neuroticism. Growth models indicated that internalizing and number of self-reported post-job-loss stressors generally declined, following parallel trajectories across 6 months. This association was stronger for those higher in neuroticism. Cross-lagged analyses over 6-week intervals found that the number of prior self-reported stressors predicted increases in symptoms, and prior symptom levels predicted increases in the number of stressors reported. These effects were present for general internalizing and for unique depressive symptoms, but not for anxiety, and were not intensified by neuroticism. Contextual severity of stressful events predicted unique depressive symptoms but not internalizing or unique anxiety over 6 week intervals. The low frequency of these events probably reduced power to detect effects at this time scale. One finding, that higher levels of unique worry were associated with subsequent decreases in number of self-reported stressors, was contrary to the stress generation thesis, but the effect size was modest, and was not replicated in any other analyses, reducing confidence in the effect.

A more complex picture emerged for re-employment and internalizing symptoms. Findings for six week lags supported a moderated reciprocal effects model for general internalizing; those high on internalizing became re-employed less quickly, and re-employment ameliorated internalizing. Higher neuroticism intensified the former association, and suppressed the latter. Six-month growth patterns indicated that those low on neuroticism decreased in internalizing regardless of employment status, while those high on neuroticism showed reductions in internalizing only if they regained employment. Unique depression also fit a reciprocal effects model across 6 week intervals, although only the stress resolution path was moderated by neuroticism. Effects for unique worry were contrary to hypothesis, with those higher in unique worry becoming reemployed more quickly, and re-employment increasing subsequent worry. It is possible that variation in worry remaining after controlling for general internalizing may reflect patterns of non-pathological concern that in fact

increase motivation for job search, with re-employment leading to decrease in self-reported symptoms.

What mechanisms might underlie reciprocal effects of stressors and internalizing? Promising candidates include emotion dysregulation and compromised motivation. There is substantial research indicating that exposure to stressors is followed by more emotion dysregulation (Paul & Moser, 2009). For stress generation there is growing evidence that depression can have a negative impact on social relationships (Hammen, 1991), leading to increased rates of social stressors. Stress generation effects were supported in our study for both general internalizing and unique depression, suggesting that dysregulation of negative emotions in general, when combined with more intense depression symptoms, could lead to both conflict within and perhaps even loss of social relationships. Although our stressor measures did not directly assess specific social stressors, they do include events that have social dimensions, including changes in housing, or interactions with potential employers.

An alternative explanation involves compromised motivation. Emotion dysregulation has also been associated with decreases in motivation and increased avoidance behavior (Chawla & Ostofin, 2007), with some evidence that avoidance behavior contributes to stress generation (Holahan et al., 2005). Maintaining motivation to search for re-employment, especially in the face of multiple rejections, appears to be a key element in successful coping and in attainment of new employment (Vinokur & Schul, 1997). This is consistent with our findings for both post-job-loss stressors and rates of re-employment. In addition, it may also help to explain contradictory findings concerning unique worry. Given that variation in unique worry was independent of the general internalizing factor, it may have indexed the more cognitive aspects of worry, rather than associated physiological arousal. These cognitive components may lead to increased motivation for active coping and searching for employment, congruent with our finding that higher unique worry was associated with increased rates of subsequent re-employment. These speculations can only be tested in future research that evaluates whether these affective or motivational factors mediate associations between stressors and internalizing.

Findings concerning the moderating effects of neuroticism were more mixed. Neuroticism did not moderate the association between any symptom index and either the severity of job loss or contextual threat of post-job-loss events. However higher neuroticism was associated with stronger associations of post job-loss stressors and internalizing over both shorter and longer time frames, and neuroticism did moderate associations between symptoms and re-employment at shorter time scales for both general internalizing and unique depression. The reciprocal effects of internalizing and stressors may contribute to the stable elevation of internalizing for those high on neuroticism who fail to find employment and continue to be exposed to stressors. These effects may be weakened by re-employment, and appear less operational in those low on neuroticism. We have no evidence to clarify whether this might involve changes in emotional reactivity or motivation; future studies will be necessary to address this question.

This study has a number of limitations that need to be addressed. Stressors associated with job loss provide an important laboratory for studying stress and internalizing, but they do not

cover the full range of conditions that lead to stress response. As a result, these findings may not generalize to stressful contexts that involve very different forms of threat, such as loss of intimate family members or exposure to severe physical danger.

It is also possible that the assessment of neuroticism might have been affected by unemployment, given evidence from other studies that exposure to stress may change neuroticism scores. This is unlikely, for several reasons. The neuroticism score was derived from three measurement occasions spanning six months, a period when a substantial portion of the sample regained employment. We used a latent state-trait analysis that also modeled and controlled for change in neuroticism scores. This analysis found no evidence for overall linear change in neuroticism scores, and slope variability did not differ significantly from zero, even though a substantial portion of the sample became re-employed during this time. This suggests that our index of neuroticism was highly stable. In addition, this index was uncorrelated with severity of unemployment ($r = .056$), and was correlated with only one of eight indexes of re-employment (full-time employment at T2), and in an unexpected direction (those returning to full-time re-employment at T2 had higher neuroticism scores compared to those who remained unemployed.)

Another possibility is that the association of neuroticism with symptom change was confounded with stable levels of internalizing. However, all analyses controlled for overall level of internalizing symptoms. All growth models included internalizing intercepts as covariates, and latent change and autoregressive models controlled for time t levels of symptoms in studying change from t to $t+1$.

This study used a number of methods for ruling out alternative causal explanations for findings, including direct modeling of change, analyses that allowed for temporal priority between independent and dependent variables, and inclusion of covariates including prior levels of the dependent variable in order to control for possible confounding. This represents an important advance over many studies in this area, but as always may not control for all relevant confounds. In particular, our cross-lag regression findings do not point to unidirectional causal priority for stressors or internalizing, leading us to advance the reciprocal effects model as a viable alternative. Future research in this area needs to consider whether there are plausible alternative mechanisms that might account for these more complex findings through confounding, even after all current covariates, including neuroticism, are taken into account.

This study used a regional sampling design to obtain a sample with substantial variation on key demographic variables, including gender, age, prior occupation, urban/rural status, and ethnicity. However, the sample contains few Latino or Asian participants, and is likely to under-represent high SES populations, who are less likely to use state employment agencies.

Looking to the future, this study provides support for a more complex dynamic perspective on stressors and internalizing symptoms, and suggests that this dynamic process may vary across personality dimensions or other person factors. Future research would do well to expand the scope to study other personality characteristics. In addition, we need to understand the mechanisms that underlie this dynamic, and future studies would benefit

from including more proximal mediators as a means of unpacking such mechanisms, in turn providing more proximal targets for interventions to prevent or ameliorate severe internalizing.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

We wish to acknowledge the vital support of Thomas Wendell and Julie Ellen Squire of the Maryland Department of Labor, Licensing and Review. We also thank Amy Whitesel, Chris Nettles, and Ania Hornberger for their contributions to the study.

Funding

The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: Preparation of this manuscript was supported by Grant R01 MH073712 from the National Institute of Mental Health awarded to George W. Howe.

References

- Behar E, Alcaine O, Zuellig AR, Borkovec TD. Screening for generalized anxiety disorder using the Penn State Worry Questionnaire: A receiver operating characteristic analysis. *Journal of Behavior Therapy and Experimental Psychiatry*. 2003; 34:25–43. [PubMed: 12763391]
- Bolger N, Zuckerman A. A framework for studying personality in the stress process. *Journal of Personality and Social Psychology*. 1995; 69:890–902. [PubMed: 7473036]
- Brown, GW., Harris, TO. Social origins of depression: a study of psychiatric disorder in women. New York, NY: Free Press; 1978.
- Brown TA, Rosellini AJ. The direct and interactive effects of neuroticism and life stress on the severity and longitudinal course of depressive symptoms. *Journal of Abnormal Psychology*. 2011; 120:844–856. [PubMed: 21381799]
- Cole JC, Rabin AS, Smith TL, Kaufman AS. Development and Validation of a Rasch-Derived CES-D Short Form. *Psychological Assessment*. 2004; 16:360–372. [PubMed: 15584795]
- Conway CC, Hammen C, Brennan PA. Expanding stress generation theory: Test of a transdiagnostic model. *Journal of Abnormal Psychology*. 2012; 121:754–766. [PubMed: 22428789]
- Costa, PT., McCrae, RR. Revised NEO Personality Inventory (NEO PI-R) and NEO-Five Factor Inventory professional manual. Odessa, FL: Psychological Assessment Resources; 1997.
- Davidson JRT, Miner CM, De Veauh-Geiss J, Tupler LA, Colket JT, Potts NLS. The Brief Social Phobia Scale: A psychometric evaluation. *Psychological Medicine*. 1997; 27:161–166. [PubMed: 9122296]
- Eberhart NK, Hammen CL. Interpersonal style, stress, and depression: An examination of transactional and diathesis-stress models. *Journal of Social and Clinical Psychology*. 2010; 29:23–38. [PubMed: 21052552]
- Enders, CK. Applied missing data analysis. New York, NY: Guilford; 2010.
- Filho AS, Hetem LAB, Ferrari MCF, Trzesniak C, Martín-Santos R, Borduqui T, ... Crippa JAS. Social anxiety disorder: What are we losing with the current diagnostic criteria? *Acta Psychiatrica Scandinavica*. 2010; 121:216–226. [PubMed: 19694635]
- Ginexi EM, Howe GW, Caplan RD. Depression and control beliefs in relation to reemployment: What are the directions of effect? *Journal of Occupational Health Psychology*. 2000; 5:323–336. [PubMed: 10912496]
- Hammen C. Generation of stress in the course of unipolar depression. *Journal of Abnormal Psychology*. 1991; 100:555–561. [PubMed: 1757669]

- Holahan CJ, Moos RH, Holahan CK, Brennan PL, Schutte KK. Stress Generation, Avoidance Coping, and Depressive Symptoms: A 10-Year Model. *Journal of Consulting and Clinical Psychology*. 2005; 73:658–666. [PubMed: 16173853]
- Howe GW, Hornberger AP, Weihs K, Moreno F, Neiderhiser JM. Higher-order structure in the trajectories of depression and anxiety following sudden involuntary unemployment. *Journal of Abnormal Psychology*. 2012; 121:325–338. DOI: 10.1037/a0026243 [PubMed: 22103803]
- Howe GW, Levy ML, Caplan RD. Job Loss and Depressive Symptoms in Couples: Common Stressors, Stress Transmission, or Relationship Disruption? *Journal of Family Psychology*. 2004; 18:639–650. DOI: 10.1037/0893-3200.18.4.639 [PubMed: 15598169]
- Joiner TE Jr, Wingate LR, Gencoz T, Gencoz F. Stress generation in depression: Three studies on its resilience, possible mechanism, and symptom specificity. *Journal of Social and Clinical Psychology*. 2005; 24:236–253.
- Katzman MA, Vermani M, Jacobs L, Marcus M, Kong B, Lessard S, ... Gendron A. Quetiapine as an adjunctive pharmacotherapy for the treatment of non-remitting generalized anxiety disorder: A flexible-dose, open-label pilot trial. *Journal of Anxiety Disorders*. 2008; 22:1480–1486. [PubMed: 18455360]
- Kendler KS, Karkowski LM, Prescott CA. Stressful life events and major depression: risk period, long-term contextual threat, and diagnostic specificity. *The Journal Of Nervous And Mental Disease*. 1998; 186:661–669. [PubMed: 9824167]
- Kendler KS, Prescott CA, Myers J, Neale MC. The structure of genetic and environmental risk factors for common psychiatric and substance use disorders in men and women. *Archives of General Psychiatry*. 2003; 60:929–937. DOI: 10.1001/archpsyc.60.9.929 [PubMed: 12963675]
- Kim J, Deater-Deckard K. Dynamic changes in anger, externalizing and internalizing problems: Attention and regulation. *Journal of Child Psychology and Psychiatry*. 2011; 52:156–166. [PubMed: 20825522]
- Kotov R, Gamez W, Schmidt F, Watson D. Linking “big” personality traits to anxiety, depressive, and substance use disorders: A meta-analysis. *Psychological Bulletin*. 2010; 136:768–821. [PubMed: 20804236]
- Lahey BB, Applegate B, Hakes JK, Zald DH, Hariri AR, Rathouz PJ. Is there a general factor of prevalent psychopathology during adulthood? *Journal of Abnormal Psychology*. 2012; 121:971–977. [PubMed: 22845652]
- Lahey BB, Van Hulle CA, Singh AL, Waldman ID, Rathouz PJ. Higher-order genetic and environmental structure of prevalent forms of child and adolescent psychopathology. *Archives of General Psychiatry*. 2011; 68:181–189. [PubMed: 21300945]
- Liu RT, Alloy LB. Stress generation in depression: A systematic review of the empirical literature and recommendations for future study. *Clinical Psychology Review*. 2010; 30:582–593. [PubMed: 20478648]
- McArdle, JJ. Dynamic but structural equation modeling of repeated measures data. In: Nesselroade, JR., Cattell, RB., editors. *The handbook of multivariate experimental psychology*. Vol. 2. New York, NY: Plenum Press; 1988.
- McArdle, JJ., Nesselroade, JR. *Longitudinal data analysis using structural equation models*. Washington, DC: American Psychological Association; 2014.
- Meyer TJ, Miller ML, Metzger RL, Borkovec TD. Development and validation of the Penn State Worry Questionnaire. *Behaviour Research and Therapy*. 1990; 28:487–495. [PubMed: 2076086]
- Monfort SS, Howe GW, Nettles CD, Weihs KL. A longitudinal examination of re-employment quality on internalizing symptoms and job-search intentions. *Journal of Occupational Health Psychology*. 2015; 20:50–61. [PubMed: 25151465]
- Murray G, Rawlings D, Allen NB, Trinder J. NEO Five-Factor Inventory Scores: Psychometric Properties in a Community Sample. *Measurement and Evaluation in Counseling and Development*. 2003; 36:140–149.
- Muthén, LK., Muthén, BO. *Mplus User's Guide*. 6. Los Angeles, CA: Muthén & Muthén; 1998–2010.
- Ormel J, Jeronimus BF, Kotov R, Riese H, Bos EH, Hankin B, ... Oldehinkel AJ. Neuroticism and common mental disorders: Meaning and utility of a complex relationship. *Clinical Psychology Review*. 2013; 33:686–697. [PubMed: 23702592]

- Ormel J, Wohlfarth T. How neuroticism, long-term difficulties, and life situation change influence psychological distress: A longitudinal model. *Journal of Personality and Social Psychology*. 1991; 60:744–755. [PubMed: 2072254]
- Paul KI, Moser K. Unemployment impairs mental health: Meta-analyses. *Journal of Vocational Behavior*. 2009; 74:264–282. DOI: 10.1016/j.jvb.2009.01.001
- Price, RH., Friedland, DS., Vinokur, AD. Job loss: hard times and eroded identity. In: Harvey, JH., editor. *Perspectives on job loss: A sourcebook*. Philadelphia, PA: Taylor & Francis; 1998. p. 303-316.
- Radloff LS. The CES-D Scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*. 1977; 1:385–401.
- Sahl JC, Cohen LH, Dasch KB. Hostility, interpersonal competence, and daily dependent stress: A daily model of stress generation. *Cognitive Therapy and Research*. 2009; 33:199–210.
- Uliaszek AA, Zinbarg RE, Mineka S, Craske MG, Griffith JW, Sutton JM, ... Hammen C. A longitudinal examination of stress generation in depressive and anxiety disorders. *Journal of Abnormal Psychology*. 2012; 121:4–15. [PubMed: 22004114]
- Vinokur AD, Schul Y. Mastery and inoculation against setbacks as active ingredients in the JOBS intervention for the unemployed. *Journal of Consulting and Clinical Psychology*. 1997; 65:867–877. DOI: 10.1037/0022-006X.65.5.867 [PubMed: 9337505]
- Wethington, E. Structured Life Events Inventory. In: Zalaquett, CP., Wood, RJ., editors. *Evaluating stress: A book of resources*. Lanham, MD, US: Scarecrow Education; 1997. p. 391-403.

Figure 1. Estimated internalizing slopes by neuroticism and re-employment status. High and low neuroticism defined as plus or minus one standard deviation from the mean.

Table 1

Independent variables	B	SE B	β
C2: Fully employed by T2	0.097	0.250	0.040
C3: Fully employed by T3 or T4	0.078	0.208	0.038
C4: Partially employed by T2	0.175	0.228	0.077
C5: Partially employed by T3 or T4	0.389	0.235	0.176
Neuroticism (NEO)	1.502 ***	0.134	1.159
NEO $\times$ C2	-0.432 *	0.186	-0.238
NEO $\times$ C3	-0.573 ***	0.174	-0.327
NEO $\times$ C4	-0.662 ***	0.171	-0.407
NEO $\times$ C5	-0.640 ***	0.185	-0.372

NOTE:

*
p < .05;**
p < .01;***
p < .001

Parameters for covariates are not included to simplify table.

Table 2

Dependent variable	Independent variables	B	SE B	β
Change in internalizing	Internalizing (t)	−0.296***	0.039	−0.554
	Partial re-employment (t)	−0.353	0.236	−0.109
	Full re-employment (t)	−0.449	0.267	−0.139
	Neuroticism (NEO)	3.346***	0.374	0.616
	NEO × Partial re-employment	0.089*	0.039	0.070
	NEO × Full re-employment	0.099*	0.043	0.083
Partial re-employment (t+1)	Partial re-employment (t)	3.740***	0.302	
	Full re-employment (t)	0.898	0.487	
	Internalizing (t)	0.023	0.054	
	Neuroticism (NEO)	0.201	0.264	
	NEO × Internalizing (t)	−0.040	0.028	
Full re-employment (t+1)	Partial re-employment (t)	1.089**	0.413	
	Full re-employment (t)	4.213***	0.358	
	Internalizing (t)	0.062	0.054	
	Neuroticism (NEO)	−0.086	0.271	
	NEO × Internalizing (t)	−0.065*	0.032	

NOTE:

*
p < .05;**
p < .01;***
p < .001

Parameters for covariates are not included to simplify table. Standardized parameter estimates are not available for the two-level multinomial regression of employment status on predictors.