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COPING TRAJECTORIES IN EMERGING ADULTHOOD: THE INFLUENCE OF TEMPERAMENT AND GENDER

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Abstract

Objective: The study of coping has far-reaching implications for understanding psychopathology and resilience, as well as for the treatment of psychological disorders. Developmental work has examined how the ability to cope changes across time in children and adolescents; however, work in emerging adulthood is still lacking. Coping is thought to emerge from basic biological and psychological processes, such as temperament and gender, which may influence the trajectory of coping use over time.

Method: Using a sample of college students (N = 1000), our four-year longitudinal study with yearly assessments sought to 1) examine the trajectory of coping styles in emerging adulthood, and to 2) examine the influence of temperament and gender on these coping trajectories.

Results: Our findings suggest that young adults' use of avoidance strategies decreased slightly over college, whereas the use of approach strategies and social support-seeking remained stable. Temperament (BIS/BAS) and gender were related to certain coping styles at baseline and appeared to have an influence on some these trajectories over time, though these associations were complex.

Conclusions: This work may inform intervention research attempting to promote adaptive coping because it may help identify young adults in most need of such interventions.

Keywords

Coping; development; emerging adulthood; temperament

Introduction

The way individuals cope with challenges has a substantial impact on their well-being and functioning (Cheng, Lau, & Chan, 2014; Littleton, Horsley, John, & Nelson, 2007). For this reason, the study of coping has far-reaching implications for understanding psychopathology

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and resilience, as well as for the treatment of psychological disorders (Boxer, Sloan-Power, Mercado, & Schappell, 2012; Coyne & Racioppo, 2000; Skinner, Pitzer, & Brule, 2014). Lazarus and Folkman's (1984) Transactional Model, an influential framework for understanding this construct, defines coping as all the "cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (Lazarus & Folkman, 1984, p. 141).

Coping theories have made distinctions among unique types of coping styles. Though there is much debate regarding the best approach to classifying coping strategies (Skinner, Edge, Altman, & Sherwood, 2003), many researchers have classified strategies using two primary methods. The first is to use statistical methods such as exploratory factor analyses (EFAs) to group strategies (inductive approach). The second is to use top-down rational classification based on some shared characteristic, such as function (deductive approach). Common classifications found in the literature include approach versus avoidance categories, which distinguishes strategies based on how individuals attend to stressors. Another grouping has included problem-focused versus emotion-focused, which distinguishes strategies that are focused on the stressor itself and those that are focused on the emotions the stressor has generated. Other examples of categories found in the literature have included social-support seeking, distraction, and cognitive strategies (Skinner et al. 2003).

Whether a specific coping strategy is adaptive or maladaptive will ultimately depend on the outcome, though a general trend has been observed in the literature, whereby approach- or problem-focused strategies have been associated with psychological health, whereas avoidance strategies have been linked to many forms of psychopathology (Aldwin & Revenson, 1987; Watson & Sinha, 2008). Furthermore, approach coping, but not avoidance coping, is predictive of other positive life outcomes, such as better social functioning, well-being, and quality of life (Davis and Brekke, 2014; Del Mar Ferradás et al., 2016; Meyer, 2001; Tartaglia, Conte, Rollero, & De Piccoli, 2018; Tiet et al., 2006).

The stability of coping has also been an area of debate. Some have asserted that coping is situation specific, particularly within the Folkman and Lazarus (1984) view, such that a person may utilize different coping strategies depending on the context and type of stressor they experience (e.g. Barrett & Gross, 2001; Cheng, 2001; Folkman & Lazarus, 1984; Gross, 1998). This work suggests that coping processes are dynamic, employed in response to environmental demands. In contrast, another perspective emphasizes the trait-like nature of coping (e.g. Carver & Connor-Smith, 2010). In this view, coping is thought to be largely dispositional and changes little over time. Interestingly, in a review of the evidence regarding both contextual and dispositional factors associated with coping, Moos and Holahan (2003) conclude that these viewpoints are not incongruent. They suggest that both perspectives can be integrated; individuals may tend to use a certain set of strategies, though the specific strategies chosen in a situation may vary by context. Also important to this discussion about the stability of coping is the evidence showing developmental shifts in coping across time. This literature, reviewed next, suggests that the disposition to use certain coping strategies may itself change across time.

Coping across the lifespan.

Trait-like coping responses are thought to emerge from dispositional characteristics including physiological, emotional, and cognitive processes (Skinner & Zimmer-Gembeck, 2009). Given the changes in biological, cognitive, and emotional maturity that occur throughout the lifespan, it is to be expected that coping capacity should change over the life course, as the individual matures. The literature examining the development of coping across time has been limited, with only a handful of longitudinal studies conducted on this topic. Further, most of these studies have been conducted in children and in adolescents (Compas, Banez, Malcarne, & Worsham, 1991; Skinner & Zimmer-Gembeck, 2007). Nevertheless, existing work has converged on a specific pattern: an overall increase in approach strategies and a decline in avoidance strategies with age (Hoffman, Levy-Shiff, Sohlberg, & Zarizki, 1992; Seiffge-Krenke, Aunola, & Nurmi, 2009; Vierhaus, Lohaus, & Ball, 2007). This suggests that as individuals mature, their coping strategies evolve towards more adaptive styles. What is still lacking from this developmental work, however, is an understanding of how coping develops after adolescence, into young adulthood. Some have argued that young adulthood comprises a distinct developmental phase, referred to as “emerging adulthood” (ages 18–24) (Arnett, 2000). The examination of coping processes during this period of development is particularly important because 1) young adults often find themselves in new roles and contexts and must learn to cope effectively with these developmental challenges (Voelker, 2003; Vaez & Laflamme, 2008) and 2) many psychological disorders emerge during the transition into adulthood and poor coping likely plays a role in their development (Graber, Seeley, Brooks-Gunn, & Lewinsohn, 2004).

From a developmental perspective, the period of emerging adulthood is characterized by instability, as young adults begin to leave their parents’ homes, find themselves in new roles, and must learn to adapt to new environments. Furthermore, as young adults become more independent from their parents, they begin to rely increasingly on support from friends, thus making peer relationships particularly important during this period (Hartup & Stevens, 1999; Miething et al., 2016). Research has identified large-scale developmental changes that occur during this period, such as changes in identity, personality, and brain function (Bennett & Baird, 2006; Roberts & Mroczek, 2008; Schwartz, Côté, & Arnett, 2005). Just as changes in coping occur in childhood and adolescence, it is likely that developmental changes also occur during this timeframe as well. In one of the few longitudinal studies of coping to have been conducted with young adults, Wingo, Baldessarini, and Windle (2015) examined coping across four timepoints from ages 17 to 33. Their findings suggested that problem-focused coping increased sharply from ages 17 to 24 (during young adulthood), and then stabilized. Emotion-oriented coping had a slightly different trajectory, declining continuously over time. It should be noted that this finding was based on a change between two time-points, one at age 17 and the other at age 24, which does not allow us to infer precisely how and when coping changes between these two ages. In contrast, Pritchard and Wilson (2006) assessed coping in young adults throughout the first semester of college and concluded that there were no significant changes in coping styles during this timeframe. Thus, among the very few studies that have examined coping in young adulthood, timeframes studied and findings have been discrepant. Accordingly, the present study sought to extend the developmental literature on coping by examining the change in coping during

young adulthood, across the four years of college. In addition to an understanding of normative coping trajectories, we sought to examine how these trajectories may be predicted by temperament and sex, two fundamental individual differences that have been related to coping in children and in cross-sectional work (e.g. Eschenbeck, Kohlmann, & Lohaus, 2007; Markovic, Rose-Krasnor, & Coplan, 2013; Ptacek, Smith, & Dodge, 1994; Zimmer-Gembeck & Skinner, 2011).

As noted, specific types of coping styles may be associated with psychopathology and poorer functioning, which often first emerges during young adulthood. Thus, a thorough understanding of coping trajectories across the lifespan and of the predictors of these trajectories would assist interventionists in identifying vulnerable individuals and potentially help foster more adaptive strategies.

Temperament as an underlying factor in the development of coping.

At the most basic level, individual differences in stress response are regulated by neurophysiological systems and these systems likely exert an influence on the development of coping styles over time (Zimmer-Gembeck & Skinner, 2016). From a theoretical perspective, there is reason to believe that temperament and coping are related because temperamental systems may represent more primitive versions of coping strategies (or responses to stress) and may thus lay the groundwork for their development (Derryberry, Reed, & Pilkenton-Taylor, 2003). Gray's (1970, 1981) framework for defining temperamental styles may clarify this association. Gray described the existence of two temperament systems: the appetitive system, which he called the *Behavioral Activation System* (BAS) and the aversive system, labelled the *Behavioral Inhibition System* (BIS). The BAS is characterized by sensitivity to reward and is involved in active goal pursuit, whereas the BIS is characterized by sensitivity to punishment and is involved in avoidance of feared outcomes, and individuals differ in the strength of each of these systems. Relatedly, studies have found that BIS is related to more emotional distress in response to a stressor compared to BAS (Heponiemi, Keltikangas-Järvinen, Puttonen, & Ravaja, 2003). Given that BAS is associated with approach behaviors towards desired outcomes, it is likely that individuals who are high in BAS are more likely to have learned to use approach-oriented strategies to minimize stressors. Alternatively, BIS is associated with a tendency towards avoidance and more emotional distress in response to stressors; thus, high BIS would likely be associated with more avoidance coping strategies. As young people enter adulthood and face stressors associated with the demands of this developmental period, it is likely that those high in BAS will continue to implement approach-oriented strategies as they mature, whereas those who are high in BIS are likely to deal with stress and negative emotions in an avoidant manner. These strategies may become increasingly practiced and refined over time.

An abundance of cross-sectional work documents the association between personality traits (particularly the Big Five) and coping (see Carver & Conner-Smith, 2010 for a review). This review found that traits such as optimism, extraversion, openness and conscientiousness were related to more approach-focused coping styles, whereas neuroticism is related to more avoidance-focused styles. Notably, many of the studies described in the review have been cross-sectional and the authors suggest moving away from such designs. Further, though

personality and temperament are thought to be related, temperament is conceptualized as the more fundamental system that gives rise to specific personality traits (Rueda & Rothbart, 2009). Yet surprisingly, there has been little research on the association between coping and temperament, and particularly how temperament may predict coping trajectories across time. As with other aspects of the coping literature, the few studies on this topic have been primarily conducted in children. Findings suggest that children with less fearful temperaments show more adaptive coping and resilience (Markovic et al., 2013; Zimmer-Gembeck & Skinner, 2011).

To date, we are unaware of any studies examining the association between BIS/BAS and coping utilization in young adults, nor has there been work looking at differences in coping trajectories based on these temperamental styles. Thus, our study sought to fill this gap in the literature by examining BIS/BAS as a possible predictor of change in coping in emerging adulthood.

Gender.

Gender differences in coping have also been noted in the literature, but studies have yielded mixed findings as to the nature of these differences (Asthon & Fuehrer, 1993; Brougham, Zail, Mendoza, & Miller, 2009; Eschenbeck et al., 2007; Ptacek et al., 1994). A meta-analysis summarizing some of this literature (Tamres, Janicki, & Helgeson, 2002) found evidence that males may engage in more avoidant strategies for certain types of stressors (i.e. when stress was related to interpersonal relationships or the health of others). Furthermore, females were more likely to use strategies related to seeking emotional support. Although there appear to be some gender differences in coping utilization, there is a paucity of studies on whether the course of coping varies over time based on gender (see Kirchner, Forns, Amador, & Munoz, 2010 for one exception). Accordingly, as another possible individual difference influencing coping, we examine gender as a predictor in our analyses examining coping trajectories.

The Present Study

The current study attempts to advance the existing knowledge base via two aims that examine: 1) the trajectory of empirically identified coping styles in emerging adulthood, and 2) the influence of temperament and gender on these coping trajectories. We took an inductive approach to identifying coping styles, using an exploratory factor analysis (EFA). This decision was based on prior work showing that the coping items on the 14 two-item subscales of the Brief COPE fit into higher-order factors (e.g. Carver, Scheier, & Weintraub, 1989; Hastings et al, 2005; Snell, Siegert, Hay-Smith, & Surgenor, 2011). Secondly, an EFA was preferable because 9 of the 14 subscales of the original measure showed poor internal reliability (i.e. Cronbach's alphas below .80) in our sample. Our analyses derived three coping factors that appeared conceptually and empirically consistent with styles previously observed in the literature, namely approach, avoidance, and social support-seeking (e.g. Kapsou, Panayiotou, Kokkinos, & Demetriou, 2010; Kimemia, Asner-Self, & Daire, 2011; Snell et al., 2011). Based on these factors, we postulated several primary hypotheses: 1) at baseline, BIS would be associated with strategies associated with avoidance, BAS would be

associated with more approach coping, and the female gender would be associated with more social support-seeking, 2) in longitudinal analysis, unconditional models would show a decrease in avoidance coping styles and an increase in approach coping styles during this developmental time period 3) temperament would be associated with coping change prospectively such that BAS would be associated with more approach coping and BIS would be associated with more avoidance coping over time. Finally, we hypothesized that 4) gender would affect coping trajectories, though no specific hypotheses were made given the paucity of research on gender and coping trajectories. Finally, given the lack of research on social support-seeking over time, our analyses for social support-seeking were more exploratory and no hypotheses were postulated for this coping style.

Method

Participants

Participants (N = 1002) in the present study were incoming freshmen at two public universities in the northeastern and southeastern United States who were drawn from a longitudinal study examining PTSD and substance use in college. Two participants were missing all coping data and were thus not included in analyses, for a final sample size of 1000. At Time 1 (T1), the average age was 18.12 (SD = 0.45) and 64.8% were female. The breakdown by ethnicity was 72.2% Caucasian (n = 722), 11.3% Asian (n = 113), 9.0% African American (n = 90), 3.1 % biracial (n = 31), 3.3% Hispanic (n = 33), and 0.3% other (n = 3), and 0.8% were missing ethnicity information (n = 8).

Procedure

A detailed account of study procedures can be found in other reports (Read, Ouimette, White, Colder, & Farrow 2011; Read et al., 2012; Read et al., 2013). A screen was completed to identify eligible participants in the summer before matriculation. All incoming students were invited to complete an eligibility screening survey either online or by paper and pencil. Participants received a \$5 gift card upon completion of the survey. Consistent with other studies with a similar design (e.g., Lewis, Neighbors, Oster-Aaland, Kirkeby, & Larimer, 2007; Neighbors, Geisner, & Lee, 2008), this screening process achieved a 58% response rate, with a final screening pool of 3,014 students from which we drew eligible students. From this larger pool, we invited a target longitudinal sample (n = 1,234) via email with a link to the study survey. Of these, 1,002 (81.2%) completed the baseline survey. To be eligible for the longitudinal study, participants had to be between the ages of 18–24. The sample was enriched for strong representation of individuals with trauma and posttraumatic stress (n = 649) but included those both with and without trauma exposure and PTSD symptoms at baseline. This was done by inviting all those who reported at least one lifetime Criterion A trauma and endorsed at least one symptom from each of the three PTSD symptom clusters. An additional 585 students who did not meet trauma inclusion criteria were selected randomly, matched on demographic characteristics (see Read et al., 2011).

For this study, we utilized four data points, spaced one year apart, starting in September of the first college year. Retention rates were high (above 90% for the first three years and above 80% between the third and fourth time points). Regarding the longitudinal analysis of

coping styles, retention rate from Year 1 to Year 2 was approximately 92%, it was 99% from Year 2 to Year 3, and approximately 78% from Year 3 to Year 4 for all three coping styles.

Measures

Demographics.—Participants reported on several demographic characteristics including gender, age, and ethnicity. Our study included gender as a baseline predictor of growth (0 = female, 1 = male).

Coping.—We used the 28-item Brief COPE (Carver, 1997) to assess coping approaches. On a Likert scale, participants rated the extent to which they use various strategies to cope with stress. This measure has been used in different populations, both clinical and nonclinical (Gilts, Parker, Pettaway, & Cohen, 2013; Hur, MacGregor, Cherkas, Williams, & Spector, 2012; Meyer, 2001). It has also been used in college populations (Miyazaki, Bodenhorn, Zalaquett, & Ng, 2008; Schnider, Elhai, & Gray, 2007). For our study, we factor analyzed this measure, which revealed 3 factors (approach, avoidance, and social support-seeking) to be used in substantive analyses. Approach coping (11 items) included items such as “*I take action to try to make the situation better*”, “*I try to come up with a strategy about what to do*”. Avoidance coping (9 items) included items such as “*I will give up trying to deal with it*” and “*I criticize myself*”. Social support-seeking (5 items) included items such as “*I get emotional support from others*” and “*I try to get advice or help from other people about what to do*”. Higher scores on each subscale represent greater use of that coping style. Cronbach’s alpha for avoidance coping ranged from 0.70 to 0.74 across the four time points, for approach coping it ranged from 0.78 to 0.81, and for social support-seeking from 0.86 to 0.88. We averaged all the items for each coping style at each time point.

BIS/BAS.—We used Carver & White’s (1994) measure to assess these constructs. BIS was assessed with 7 items including “*I feel pretty worried or upset when I think or know somebody is angry at me*”, and “*I worry about making mistakes*”. BAS was measured using 14 items such as “*I go out of my way to get things I want*” and “*I crave excitement and new sensations*”. Participants responded to questions using a 4-point scale (1 = Strongly Disagree to 4 = Strongly Agree). Cronbach’s alphas for BIS and BAS were 0.77 and 0.82, respectively.

Posttraumatic Stress Disorder (PTSD).—We use the 17-item PTSD Checklist – Civilian Version (PCL; Weathers, Litz, Herman, Huska, & Keane, 1991), with DSM-IV symptoms to examine PTSD. Participants were asked how frequently in the last month they experienced each of the symptoms. Sample items include “*Repeated, disturbing memories, thoughts, or images of a stress experience*”, “*Feeling very upset when something reminded you a stressful experience?*” and “*Feeling jumpy or easily startled?*” (response options: 1 = not at all, 2 = a little bit, 3 = moderately, 4 = quite a bit, 5 = extremely). Higher scores indicated higher PTSD severity. Cronbach’s alpha for this measure was 0.93 at baseline and 0.95 at Year 4.

Well-Being.—Our study used 10 items of the Quality of Student Life questionnaire (Keith & Schalock, 1992) to examine well-being. This questionnaire includes items such as “*Do*

you have more or fewer problems than other people” (response options: 1 = fewer, 2 = same number, 3 = more), “*Are most of the things that happen to you* (response options: 1 = rewarding, 2 = acceptable, 3 = disappointing). “*Overall, would you say that your life is:* (response options: 1= very worthwhile, 2 = okay, 3 = worthless). Scores were recoded so that higher scores indicated higher well-being. Cronbach’s alpha for this measure was 0.80.

Social Functioning.—To examine problems in social functioning, we used Tyrer et al. (2005)’s Social Functioning Questionnaire (SFQ). This measure includes 8 items, such as “I feel lonely and isolated from other people”, “I get along well with my family and other relatives”, and “I complete my tasks at work and home satisfactorily”. Responses were measured on a 4-point scale (0 = Most of the time, 1 = Quite often, 2 = Sometimes, 3 = Not at all). Higher scores indicate worse social functioning. Cronbach’s alpha for this measure was 0.70.

Data Analytic Plan

Data were analyzed using Mplus 7.0 (Muthen & Muthen, 2012). We conducted t-tests to determine whether there were differences on gender, BIS, and BAS for those who were missing coping data at each year. There were no significant differences on gender, BIS, or BAS when comparing those who were missing coping data at times 1, 2, and 4. However, there were significant differences on BIS for those who were missing data at Year 3 for all three coping styles, with those who were missing data having slightly lower BIS scores (a mean of 2.97 compared to 3.10). We used full information maximum likelihood estimation in our models to accommodate missing data (Schafer & Graham, 2002). This method included cases with missing data and uses all information available, resulting in less biased estimates than listwise deletion of cases with missing data (Enders, 2010; Muthen & Muthen, 2012). Descriptive statistics and bivariate correlations for baseline variables are presented in Tables 1 and 2.

To investigate the primary aim of this paper, we used latent growth modeling (LGM) to model individual trajectories of change in the coping styles that emerged from the EFA at the first timepoint. To assess model fit, the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR) were examined. Acceptable model fit was defined in part by the criteria described by Hu and Bentler (1999): RMSEA values close to 0.06 or below, CFI and TLI values close to .95 or above, and SRMR values close to .08 or below.

Results

Exploratory Factor Analysis

We used an inductive approach to identifying coping styles, extracting coping factors using an exploratory factor analysis on the 28 items in the Brief COPE. Three criteria were considered: eigenvalues above 1, a factor loading of 0.30 or above on any given factor, and the interpretability of the factor structure. In addition, different rotated solutions were examined (Geomin, Promax, and Varimax). We retained the 3-factor Varimax-rotated structure, which was identical to the 3-factor Geomin-rotated structure, because it had the

fewest cross-loadings and the items on each factor appeared to be face valid, whereas other factor solutions were more complex. The factors included an Approach, an Avoidance, and a Social Support-Seeking coping factor. The Brief COPE originally specifies 14 subscales and these mapped on to our 3 factors. Our approach factor included the subscales of active coping, positive reframing, planning, humor, acceptance, and *religion*. Our avoidance factor included the items from the following subscales: denial, substance use, behavioral disengagement, and self-blame. Finally, our social support-seeking factor was characterized by the *use of emotional support*, *use of instrumental support*, and *venting* subscales.

Three of the 28 items did not meet our factor loading criteria of 0.30 and were thus not included in any of our analyses. These items were: “I turn to work or other activities to take my mind off things”, “I do something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping”, and “*I make fun of the situation*”.

Further, given that coping styles are not inherently adaptive or maladaptive, we examined how these three styles (approach, avoidance, social support-seeking) correlated with important indicators of psychological health in our dataset (see Table 3). Our dataset contained measures of well-being (at year 4), social functioning (at year 4), and PTSD (at baseline and at year 4). Overall, approach and social-support seeking tended to correlate with indicators of psychological health, whereas avoidance correlated negatively with these outcomes.

Latent Growth Curve Models

Unconditional Growth Models.—Unconditional LGM models were run to investigate coping trajectories over four years of college (models were run for approach, avoidance, and social support-seeking). For each time point, we calculated the average of the items that made up each coping factor and used these means to model our growth curves. Given that the shape of the latent growth curves was unknown, we allowed for certain slope factor loadings to be freely estimated. The following Slope factor loadings were specified: Time 1 = 0, Time 2 = freely estimated, Time 3 = freely estimated, Time 4 = 1. Using this specification, the mean of the Slope factor provides an estimate of average coping change from Time 1 to Time 4 in the metric of the marker indicator of the latent variable outcome (see Bollen & Curran, 2006). This specification converged on proper solutions for avoidance and social-support seeking coping. However, for approach coping, this specification produced a non-positive matrix error, would not converge, and did not produce interpretable estimates, even upon increasing the number of iterations. Thus, we instead specified a linear model with no freed parameters to examine this coping style, as this was considered to be the simplest alternative. We correlated the slope and intercept in all of our models. All three of these unconditional growth models had good to excellent fit to the data (see Table 4). Overall, these models suggested a significant mean decrease in avoidance coping over the four years (mean slope for avoidance = $-.040$, S.E. = $.017$, $p = .016$, variance = $.097$, $p > .05$), and no mean change in approach or social support-seeking across time (mean slope for approach = $-.010$, S.E. = $.006$, $p > .05$, variance = $.005$, $p = .015$; mean slope for social support-seeking = $.007$, S.E. = $p > .05$, variance = $.093$, $p > .05$). For avoidance coping, this

suggests that, on average, individuals decreased in their avoidance strategies by 0.13 *standard deviations (SDs)* by the end of college. We calculated Cohen's *d*, which was 0.11, which is considered to be a small effect (Cohen 1988). We also examined intraclass correlations (ICCs) for these outcomes (clustered within individuals), to examine within-person and between-person variance. The ICCs were 0.56 (approach coping), 0.52 (avoidance coping), 0.54 (social support-seeking), suggesting that approximately half of the variance for each coping style was due to differences between people.

Conditional Growth Models.—Next, baseline BIS, BAS, and gender were used as predictors in all three conditional models (i.e., three separate models with intercepts and slopes of approach, avoidance, and social support-seeking as outcomes). We correlated the slope and intercept in all of our models. Model fit was excellent for all three models (see Table 5). Given that our sample was enriched for PTSD symptoms, we controlled for PTSD symptoms at baseline. PTSD symptoms did have a small significant effect on the slope ($b = -.006$, $S.E. = .001$, $p < 0.001$) and intercept ($b = .014$, $S.E. = .001$, $p < .001$) of avoidance coping, and an effect on the intercepts of approach coping ($b = -.003$, $S.E. = .001$, $p < .039$) and social support seeking ($b = -.006$, $S.E. = .002$, $p < .001$). Below we present our results for our main predictors (temperament, gender), after controlling for PTSD.

Avoidance Coping: The results indicated a significant small positive effect of BAS ($b = .096$, $S.E. = .035$, $p = .006$), of BIS ($b = .198$, $S.E. = .028$, $p < .001$), and of gender ($b = .062$, $S.E. = .031$, $p = .041$) on the intercept of avoidance coping. This indicates that being high on BIS and/or BAS is related to higher use of avoidance coping strategies at baseline. It also suggests that males used more avoidance strategies at baseline. Furthermore, there was a small significant negative effect of BIS on the slope ($b = -.078$, $S.E. = .032$, $p = 0.014$), but no effects of either BAS or gender on the slope, ($b = .036$, $S.E. = .038$; $b = -.060$, $S.E. = .033$, $ps > 0.05$). This indicates that BIS is also related to the slope such that a higher BIS score at baseline predicts a *steeper decline* in avoidance coping over time. In this model, the slope and intercept were not significantly correlated.

Approach Coping: Results suggested that both BIS and BAS predicted the intercept, such that higher BIS was related to fewer approach coping strategies and higher BAS was related to more approach strategies at baseline ($b = -.121$, $S.E. = .033$, $p < 0.001$, and $b = .30$, $S.E. = .040$, $p < .001$). In this model, there was a small significant effect of BAS on the slope ($b = -.034$, $S.E. = .015$, $p = .02$), suggesting a that higher BAS is associated with a *decline* in approach strategies over time. The other independent variables (BIS and gender) did not predict the slope ($b = .017$, $S.E. = .012$; $b = -.002$, $S.E. = .013$, $ps > 0.05$). The slope and intercept were not significantly correlated.

Social Support-Seeking: All three independent variables significantly predicted the intercept in this model. Both BIS and BAS were positively associated with the intercept ($b = .258$, $S.E. = .046$, $p < .001$; $b = .30$, $S.E. = .057$, $p < .001$), suggesting that both higher BIS and higher BAS at baseline predicted higher social support-seeking at baseline. At baseline, males were less likely to utilize social support-seeking compared to females ($b = -.33$, $S.E. = .054$, $p < 0.001$). Further, BAS and gender had a small significant effect on the slope, but

BIS did not. Higher BAS at baseline was negatively associated ($b = -.179$, $S.E. = .069$, $p = .009$) with the slope. Regarding gender, males showed a greater decline in social support seeking over time compared to females ($b = -.146$, $S.E. = .060$, $p = .014$). In this model, the slope and intercept were not significantly associated.

Discussion

Coping is fundamental to psychological well-being and by examining underlying processes, developmental work can shed light on ways of promoting more adaptive coping across the lifespan. To date, such examinations of coping at critical developmental junctures, including throughout college, have been lacking. With this study, we sought to address this important gap in the literature, by examining the developmental trajectory of coping in emerging adults at entry into and across the course of college. An additional innovation of this work is that we examined important predictors of these trajectories, namely, temperament and gender. These findings contribute to our understanding of how coping changes over time and what factors may underlie its transformation.

Our findings suggested that the use of avoidance strategies, on average, showed a small decrease over the four years of college, whereas mean levels of approach and social-support seeking coping remained stable. The finding regarding the decline of avoidance strategies was consistent with our predictions; however, the stability of approach strategies was somewhat surprising, given that other developmental work has typically found an increase in approach strategies with time (Hoffman et al., 1992; Seiffge-Krenke et al., 2009; Vierhaus et al., 2007; Wingo et al., 2015). It is important to note that these other studies were primarily conducted in children and adolescents. These data, modeling coping trajectories beyond adolescence, suggest that approach coping may increase in early adolescence but then may begin to plateau in young adulthood.

Prior research on social support-seeking has yielded mixed findings, with some studies showing an increase and others, decreases in this coping strategy in children and adolescents (see Skinner & Zimmer-Gembeck, 2007 for review). Our data suggest that, on average, social support-seeking remains stable across young adulthood, again indicating that this strategy likely also plateaus at this developmental juncture.

Particularly interesting were our findings regarding how these trajectories may differ based on temperament and gender. Consistent with our hypotheses, higher BIS was related to more frequent use of avoidance strategies and less use of approach strategies at baseline. This suggests that individuals who are particularly inhibited may be more likely to avoid negative emotions and stressors as they develop their coping approach. Interestingly, BIS also was associated with more social support-seeking at baseline, suggesting that high BIS is associated with a reliance on others for emotional support. Our data also suggested that a temperamental predisposition toward behavioral activation was positively associated with the use of all coping strategy types at baseline. The increased use of avoidance strategies for those high in BAS was contrary to our hypotheses, given that BAS has been hypothesized to primarily influence the use of approach-orientated strategies (Derryberry et al., 2003), not avoidance ones. One possible explanation for this finding is that because those high on BAS

are more approach-oriented in their motivations, they may have more opportunities to learn different coping strategies. As such, they may be more likely to use a variety of strategies early in adulthood.

Our findings showing the use of social support in both BIS and BAS is consistent with another recent study (High & Solomon, 2014), showing that both temperaments were correlated with the use of this strategy. Interestingly, these authors found evidence to suggest that high BAS individuals may use friends to help problem-solve, whereas high BIS individuals may rely on friends primarily for emotional support. It is possible that BIS and BAS in our sample also use social support in these differing ways, though we were unable to test this hypothesis. Replication of this finding, coupled with assessment of other processes that may help to understand the association are necessary to shed more light on the nature of this finding.

Regarding the influence of our predictors on the developmental trajectories of coping, higher BIS was related to a small steeper decline in avoidance strategies. This suggests that although more inhibited young adults use more avoidance strategies at baseline, they may become more similar to their peers in their use of avoidance as they mature in early adulthood. Interestingly, BIS was not associated with an increase in approach strategies or social support-seeking and so it does not appear to be the case that these individuals are learning to replace avoidance strategies with other strategies as they mature into independent adults over the course of college. Similarly, higher BAS was related to a small decrease in social support-seeking and approach strategies but was not related to a change in avoidance strategies. Thus, it appears that those high in BAS maintain their avoidance strategies over college and utilize social support and approach strategies less frequently to cope with stress mature during the early adult years.

Our third predictor, gender, was significantly associated with social support-seeking such that females used this strategy more than males at baseline, and males showed a small decline in the use of strategy over time. Throughout young adulthood, males and females become more different with regards to their use of others to cope with stress. However, there were no gender differences for approach or avoidance strategies, either at baseline or over time. This finding is consistent with the meta-analysis by Tamres et al. (2002) in which the authors conclude that the main coping differences between males and females were related to the use of social support. They also found that any differences between the genders for approach or avoidance strategies only existed if the stressors were interpersonal in nature.

Limitations and future directions

This study had several limitations, which may also inform future research. First, we chose to use an inductive approach to classifying coping (i.e. an exploratory factor analysis), a strategy that has been used and suggested by others (e.g. Hastings et al, 2005; Carver et al., 1989; Snell et al., 2011). Our factors were face valid and showed strong internal validity, but there may be other ways to classify coping strategies. This issue of the structure of coping is not specific to our study as it is a central problem within the larger coping literature. A review by Skinner et al. (2003) suggests that the classic distinction between approach and

avoidance, or adaptive and maladaptive, may not be an optimal system for classifying coping. Relatedly, social-support seeking emerged as a separate factor in our data, but some studies have considered this set of strategies to be part of approach coping (see Skinner et al., 2003 for more information).

Another limitation was that our study relied on retrospective self-report measures. Though this is typically how coping is measured, this method may be influenced by individual differences such as memory biases. Future work would benefit from the creation and use of behavioral indices of coping ability to assess the use of strategies *as a stressor occurs*. Some work has used heart rate variability, for example, as a measure of emotion regulation (Appelhans & Luecken, 2006). In this way, researchers may improve our understanding of how individuals cope with stress and whether these measures map onto self-reported measures. It would be important to examine how coping, measured behaviorally, changes across time. Thus, future lab-based and ecological momentary assessment (EMA) studies are recommended to examine how coping ability changes across development.

Momentary assessments would also allow researchers to examine coping *flexibility*, which is the ability to deploy various strategies dependent on context and requires an ability to understand what strategies would be most effective in different situations (Bonanno & Burton, 2013; Cheng et al., 2014). In these ways, further research should attempt to capture greater dimensionality in the coping construct in order to better study its prospective course and association with underlying processes. Next, our data focused on a college population to examine coping change in emerging adulthood. College students may be different in important ways from young adults who do not attend college. For one, they may be of a higher socioeconomic class and may have other resources that would help them cope with stress (i.e. monetary resources, access and means to pay for mental health care, social support from local peers, etc.). Thus, to determine whether our findings are generalizable to all young adults, other work must be carried out in non-college samples.

Finally, our study focused on baseline predictors of change in coping styles. However, it may also be important to consider other changes that may occur during this period; for example, young people may appraise stressors differently as they gain confidence and self-efficacy, gain new skills, learn independence, and focus on new goals. Furthermore, temperament and personality may change during this developmental juncture (Helson, Kwan, John, & Jones, 2002; Robins, Fraley, Roberts, & Trzesniewski, 2001), which may account for some of the changes in coping we observed. An examination of longitudinal associations between coping and these other factors may be a useful avenue for future work.

Conclusion

To our knowledge, the current study represents one of the only prospective examinations of the evolution of coping in young adulthood. Our findings suggest that young adults' use of avoidance strategies decreased over time, whereas the use of approach strategies and social support-seeking remained stable. Temperament (BIS/BAS) and gender were related to certain coping types at baseline and appeared to have an influence on some of these trajectories over time, though these associations are complex. These findings illustrate the

associations between coping and more fundamental temperamental traits that may underlie its development. Work such as ours may inform intervention research attempting to promote adaptive coping. As approach coping in our sample appeared to plateau with time, interventions may be most beneficial either before or early in young adulthood to bolster coping capabilities in this population.

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Table 1.

Descriptive Statistics

Variable	Year 1	Year 2	Year 3	Year 4
	M (SD)	M (SD)	M (SD)	M (SD)
Age	18.12 (0.45)	19.10 (0.41)	20.10 (0.41)	21.10 (0.38)
Avoidance Coping	1.84 (0.51)	1.80 (0.51)	1.80 (0.52)	1.78 (0.51)
Approach Coping	2.64 (0.54)	2.59 (0.56)	2.59 (0.53)	2.59 (0.51)
Social Support Seeking	2.65 (0.80)	2.63 (0.80)	2.64 (0.82)	2.69 (0.82)
Behavioral Activation (BAS)	3.11 (0.40)	-	-	-
Behavioral Inhibition (BIS)	3.09 (0.54)	-	-	-
PTSD symptoms	32.83 (13.61)	-	-	26.24 (11.88)

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Table 2.

Bivariate correlations for baseline variables

Variable	1	2	3	4	5	6
1. BIS	-	-	-	-	-	-
2. BAS	0.06	-	-	-	-	-
3. Gender	-0.35**	-0.05	-	-	-	-
4. Avoidance Coping	0.32**	0.13**	-0.07*	-	-	-
5. Approach Coping	-0.13**	0.23**	0.05	-0.19**	-	-
6. Social Support Seeking	0.22**	0.15**	-0.24**	0.03	0.29**	-
7. PTSD symptoms	0.31**	0.15**	-0.15**	0.45**	-0.08*	-0.03

Note. Gender was coded 0 for females, 1 for males.

** Correlation is significant at $p < 0.001$.

* Correlation is significant at $p < 0.05$

Table 3.

Bivariate correlations among coping styles and psychological health at Year 4

Variable	1	2	3	4	5
1. Avoidance Coping	-	-	-	-	-
2. Social Support Seeking	0.07	-	-	-	-
3. Approach Coping	-0.09 [*]	0.23 ^{**}	-	-	-
4. Difficulties in Social Functioning	0.47 ^{**}	-0.16 ^{**}	-0.23 ^{**}	-	-
5. Well-Being	-0.39 ^{**}	0.14 ^{**}	0.34 ^{**}	-0.68 ^{**}	-
6. PTSD symptoms	0.38 ^{**}	0.00	-0.09 [*]	0.41 ^{**}	-0.33 ^{**}

^{**} Correlation is significant at $p < 0.001$.

^{*} Correlation is significant at $p < 0.05$

Table 4.

Model fit for unconditional models

Model Fit Indices	Avoidance Coping	Approach Coping	Social Support-Seeking
RMSEA	0	0.06	0.03
CFI	1.00	0.99	1.00
TLI	1.00	0.98	0.99
SRMR	0.02	0.07	0.03

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Table 5.

Model fit for conditional models

Model Fit Indices	Avoidance Coping	Approach Coping	Social Support-Seeking
RMSEA	0.01	0.04	0.01
CFI	1.00	0.98	1.00
TLI	1.00	0.97	1.00
SRMR	0.02	0.04	0.02

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