A Hierarchical Model of Coping in the College Student Population

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Abstract

Research has indicated a fall in college student mental health over the past 16 years, with no corresponding increase in use of mental health care services. To investigate how college students choose to manage stressful issues, we assessed coping styles as measured by the dispositional COPE inventory in a multi-state sample of undergraduate students ($N = 109$).We tested a four-factor, hierarchical model of coping with a factor-based variant of partial least squares structural equation modeling (PLS-SEM), an approach noted for its accuracy with small sample sizes. Results indicated the existence of a hierarchical effect that explained 67.4 percent of variance in coping subscale scores, and validated the four factors of Approach, Avoidance, Social-Contextual, and Individual-Contextual coping styles. All coping style pairs had significant positive relationships ($p \leq .002$) with one exception; Approach and Avoidance had a significant negative relationship ($p < .001$). Implications for researchers and practitioners are discussed.

Keywords: coping, college students, mental health

Introduction

Within the behavioral sciences, there exists a long history of inquiry into how individuals navigate stressful life events (Lazarus & Folkman, 1984; Roth & Cohen, 1986). Research has defined coping as a continuous process of cognitive and behavioral action in response to a stressor. An individual engages in these coping strategies in an effort to manage the distress resulting from anew stressor. Operationally, coping is defined as the "cognitive and behavioral efforts to manage the internal and external demands of the person-environment

transaction that is appraised as taxing or exceeding the resources of the person" (Folkman, S., Lazarus, R. S., Dunkel-Schetter, C., DeLongis, A., & Gruen, R. J., 1986, p. 75).

The stress-related implications for mental health are also well documented within the literature, suggesting that stress is a major factor within the etiological understanding of mental illness (Hilsman & Garber, 1995; Monroe & Simons, 1991; Walker & Diforio, 1997). Coping behaviors sit squarely within this interplay of stress and wellness as mediators, with evidence suggesting that the way individuals cope can have a significant relationship with mental health outcomes (Aldwin & Revenson, 1987; Folkman, Lazarus, Gruen & DeLongis, 1986; Suldo, Shaunessy & Hardesty, 2008).

Coping

The vast majority of theories related to coping have evolved from psychodynamic theory as a means of ego-protection in the face of a stressor that pushes an individual past the point of manageability. Over the past 30 years, many different proposed coping styles, strategies, and types have evolved, to the point where the sheer wealth of information is overwhelming. However, out of this work, two major conceptualizations have garnered the most emphasis: emotion-focused/problem focused coping and approach/avoidance coping.

The problem-focused/emotion-focused model. This particular model of coping, detailed by Lazarus and Folkman (1984), suggests individuals respond to stressors in one of two ways. Problem-focused coping occurs when an individual perceives movement through a stressful situation as possible. The perception of the possibility of change leads the individual to choose resolution specific behaviors. The converse is emotion-focused coping, employed when an individual does not perceive change as a possible option. Either of these coping forms can result in positive or negative outcomes, and in many ways are intertwined (i.e., calming one's emotions of anger to focus on more problem-solving strategies of conflict resolution). However, for the purposes of our conceptualization, this model appears to be a better categorization of coping type rather than coping style. This conclusion is partially supported by the categorizations of the COPE Inventory, the instrument used in this study. See Figure 1 for a visual explanation of our proposed relationship between coping style, type, and strategies.

The avoidance/approach model. In the past 30 years, the literature has produced a number of different conceptualizations for coping. We will focus on coping as strategies that exist on the approach/avoidance continuum. While the approach/avoidance perspective on coping has been present within the literature for many years, Roth and Cohen (1986) flesh out the particulars. They imply that an understanding of approach and avoidance coping as analogues for "good" and "bad" is short sighted. A more appropriate conceptualization is one that accounts for both the costs and benefits of each coping style in relation to the specific circumstances. For example, avoidance coping such as denial may not be effective in the long-term, but denial in the short term may reduce stress enough for an individual to allow normal functioning until they are able to reduce other stressors and give this new stressor a greater proportion of attention.

Approach strategies lead an individual toward a stressor with the intention for resolution. Conversely, avoidant strategies lead away from a stressor with the intention to reduce the negative impact on the self. Approach strategies have long been seen as the more adaptive of the two, and avoidant almost entirely non-adaptive (Moos & Holahan, 2003; Stowell, Kiecolt-Glaser, & Glaser, 2001). However, approaching a stressor can increase anxiety levels (Roth & Cohen, 1986), so it appears neither approach coping nor avoidance coping can be defined so narrowly. Additionally, there is support for the positive impact of avoidance coping. Avoidance, though typically viewed as non-adaptive, has been shown to reduce stress and prevent anxiety from becoming unmanageable (Roth & Cohen, 1986), to be beneficial when the situation is perceived as uncontrollable (Lazarus, 1983), and to prevent the use of more problematic avoidance coping such as substance use (Nielsen & Shapiro, 2009).

This conceptualization of approach and avoidance coping places a strong emphasis on the context of the situation. When studying a college population, the emphasis on context translates to the need to fully understand the unique stressors faced by college students (Ross, Niebling, & Heckert, 1999). Such an understanding requires an awareness of the sources of stress, implications for wellness, and knowledge of how research has conceptualized coping within this population.

The concept of social coping must also be emphasized in this discussion. Characterized by seeking support from others to manage a stressor, social coping behaviors have often been conceptualized within the more traditional models of coping described above, but as a part of existing categorization rather than a distinct category in its own right. Despite this simplification, multiple studies of coping from both the approach/avoidance and problem/emotion focus models have identified a consistent third factor regarding social coping behaviors when assessing coping with the Dispositional COPE Inventory (Carver, Scheier & Weintraub, 1989; Connor & Connor, 2003; Fortune, Richards, Griffiths & Main, 2002; Kallasmaa & Pulver, 2000; Lyne & Roger, 2000; Stowell, Kiecolt-Glaser & Glaser, 2001). Further work by Litman (2006) identified social coping as a separate factor along with approach and avoidance coping. In Litman's (2006) factor analysis, the COPE subscales of Emotional Social Support, Instrumental Social Support, and Focus On and Venting of Emotions all loaded on to a single factor, which they termed social-approach.

Obviously, coping can be conceptualized in a myriad of ways. However, the college experience presents new, unprecedented stressors for students no matter the frame of reference. The way students cope have a profound impact on various aspects of their lives, including mental health.

Stress and the College Student Population

College student mental health. The ability of students to manage their college experience is a chief concern for higher education institutions. Studies indicate a dramatic rise in both the prevalence and severity of mental health concerns for college students over the last 16 years, and college counseling centers have reported an increase in students seeking services (Benton, Robertson, Tseng, Newton, & Benton, 2003; Gallagher, 2014; Gallagher, Gill, & Sysco, 2000). Roberts, Warner,

Lyketsos, Frank, Ganzini, and Carter (2001) found that 47 percent of students surveyed reported at least one mental health problem. Depression, anxiety, and psychotic disorders are some of the most prominent issues presented by college students (Collins & Mowbray, 2005; Megivern, Pellerito, & Mowbray, 2003). Furthermore, there is evidence to suggest coping behavior has a direct impact on mental wellness and the development of mental illness (Aldwin & Revenson, 1987; Folkman, Lazarus, Gruen, & DeLongis, 1986). Avoidance-based coping in students has been found to be a prime predictor of mental health issues such as depression (Dyson & Renk, 2006; Mahmoud, Staten, Hall, & Lennie, 2012). Additionally, research suggests coping to be a mediator for mental health outcomes in late adolescence/early adulthood (Suldo, Shaunessy, & Hardesty, 2008).

In addition to the general impact on well-being, mental health issues in college students can negatively impact academic readiness and success. Students combatting mental health issues struggle with poor grades, academic probation (Megivern, Pellerito & Mowbray, 2003), decreased persistence to graduation (Pritchard & Wilson, 2003), and poor class attendance (Collins & Mowbray, 2005). Evidence supports a greater focus on college student mental health is justified from both student health and institutional health perspectives.

Coping behavior in the college-age individual. This leads to the question: when faced with increasingly stressful situations, what strategies do college students use to cope? Unfortunately, research suggests college students aren't using the resources available to them in the form of college counseling centers, with as many as 90 percent of students failing to seek assistance from campus-based support (Stewart-

Brown, Evans, Patterson, Petersen, Doll, Balding, & Regis, 2000). Additionally, evidence suggests that adolescents and young adults are more likely to engage in maladaptive coping strategies compared to other age groups (Blanchard-Fields, Sulsky, & Robinson-Whelen, 1991; Irion & Blanchard-Fields, 1987). More specifically, both college men and women have been found to use more avoidance oriented, maladaptive coping strategies to manage every day stressors when compared to other age groups. However, among college students specifically, women seem more likely to engage in approach strategies than college men, especially emotion-focused strategies. Dyson and Renk (2006) found similar results, citing femininity as a predictor of emotion focused coping and finding neither femininity nor masculinity a better predictor for problem-focused coping than the other. Despite this, approach coping overall has been linked to less stress and fewer symptoms of illness (Blake & Vandiver, 1988; Soderstrom, Dolbier, Leiferman & Steinhardt, 2000), and seeking social support, engaging in problem-solving, and cognitively restructuring situations can lead to more positive outcomes within the age group (Herman-Stabl, Stemmler, & Petersen, 1995; Mahmoud, Staten, Hall, & Lennie, 2012). This evidence suggests value for the development of coping interventions with college students once a more thorough understanding of college student coping behavior can be established.

The Dispositional COPE Inventory

Carver, Scheier, and Weintraub (1989) developed the Dispositional COPE with the purpose of providing a comprehensive assessment tool to measure coping behavior. Their impetus to create the COPE was based on what they perceived to be three problems with existing measures.

1. Pre-existing measures did not sample all the specific domains they felt were of interest in the study of coping behavior.
2. Coping scales developed previously often lacked a clear focus in assessment items.
3. Earlier assessments were established empirically rather than theoretically and were often poorly linked to established theoretical concepts.

There has been extensive evaluation of the information garnered from the COPE Inventory. Litman (2006) worked on determining the dimensionality of the COPE Inventory within the framework of approach/avoidance coping styles. His study suggests that items on the COPE fall into two approach categories (self-sufficient and socially supported coping) and one avoidance category. However, like the shortcomings of previous coping measures listed in Carver, Scheirer and Weintraub (1989), these categories were established empirically rather than theoretically. The nature of the validation of the categories within Litman (2006) does not imply a lack of relevance but simply leaves room for further investigations from a more theoretical perspective.

When judging by bivariate correlations, approach and avoidant coping strategies often display a positive relationship or no relationship at all (Carter, Scheirer, & Weintraub, 1989; Litman, 2006). However, when modeled via path analysis, the correlation between approach and avoidance coping becomes negative (Soderstrom, Dolbier, Leiferman, & Steinhardt, 2000), suggesting that as approach coping increases, avoidance coping decreases and vice versa. This conceptualization of the relationship between approach and avoidance coping makes more theoretical sense and suggests the use of different forms of structural equation modeling may be more appropriate to provide insight into coping's complex, interdependent structure. The cause of this discrepancy is not immediately clear; Soderstrom et al. (2000) did not examine or discuss possible reasons, and none of the other variables in their analysis have been shown to have such an effect. While it is not our central focus, we will attempt to shed some light on this issue in our analysis.

Methodology

Theory

While previous research frequently divided coping behaviors into an approach/avoidance dichotomy, not all coping instruments are designed to measure such a structure. This means that at times subscales are assigned to categories where it is conceptually difficult to justify their placement. For instance, Litman (2006) divided subscales of the COPE inventory into self-sufficient approach, social approach, and avoidance. Their analysis placed the subscales Restraint and Humor both in approach style coping, despite the fact that both types may be used either to approach or to avoid problematic issues. Both subscales consistently had low loadings on approach style coping, with an average of .55 for restraint and .40 for humor across two models. Based on this evidence, we hypothesized the existence of a fourth coping style: individual-contextual coping, which contains topics an individual may use to approach or avoid a stressful issue. For example, humor may be used either to enable an individual to deal with a stressful event or distance themselves from the event, preventing the individual from processing the stressor.

Our approach further differs from previous work in that we do not consider social coping to be a category of approach. The social scales on the COPE, such as Focus on Emotions ("I get upset and am really aware of it"), do not generally imply that an individual is moving towards or away from a topic. While this too has not been fully tested on a theoretically-based measure such as the COPE, research on empirically-based instruments has shown a positive relationship between seeking social support and avoidance coping (Dumont & Provost, 1999). The social coping style thus bears some similarity to the individual-contextual style. However, one may practice individual-contextual coping strategies alone, whereas social coping generally requires the presence of others. Socially focused personality traits such as extraversion may thus have a larger impact on social coping than on individual-contextual. As such, we consider the social and individual aspects of contextual coping to be conceptually related but not identical, and refer to them as social-contextual and individual-contextual. Empirical support for this position exists as well; Litman (2006) found in two exploratory factor analyses of COPE data that the subscales
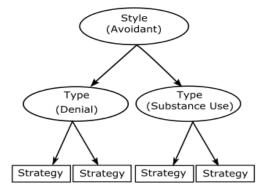

Figure 1.Hypothesized hierarchical structure of coping.

assigned to social-contextual coping consistently loaded on a separate factor from the subscales we consider individual-contextual coping.

Because coping strategies fit within coping types, which fit within coping styles, we further hypothesized a hierarchical relationship between coping strategies, types, and styles, as covered in Figure 1. To our knowledge, this is the first time a hierarchical, four-factor model of coping has been examined. While researchers have not yet tested the COPE inventory for hierarchical structure, they have shown that data from other coping assessments are clearly multilevel (Tobin, Holroyd, Reynolds, & Wigal, 1989; Iwasaki & Mannell, 2000).

Hypotheses and Research Questions

This theory leads us to three research questions:

1) What, if any, is the nature of the relationship between individual-contextual coping and other coping styles?
2) What, if any, is the nature of the relationship between social-contextual coping and other coping styles?
3) What, if any, is the nature of the relationship between approach and avoidance coping?

Along with these questions are the following hypotheses:

1) There will be significant positive relationships between individual-contextual coping and all other coping styles.
2) There will be significant positive relationships between social-

contextual coping and all other coping styles.

3) There will be a significant negative relationship between approach and avoidance coping.

Instruments

Coping skills were measured with the dispositional COPE inventory (Carver, Scheier, & Weintraub, 1989), chosen for its wide variety of coping behaviors measured. The COPE inventory assesses the frequency of specific coping strategies (such as "I let my feelings out," or "I make jokes about it"). Participants respond to each item on a scale of one ("I usually don't do this at all") to four ("I usually do this a lot"). Coping behaviors are divided up into 15 subscales of four items each, with each subscale measuring a different type of coping behavior (such as "Humor" or "Denial").

Carver, Scheier, and Weintraub (1989) found the COPE to have acceptable reliability, with an average Cronbach's alpha of .71 across all subscales. They additionally provided evidence for the COPE's convergent and discriminant validity based on subscale correlations with conceptually similar personality traits. For example, the subscale Positive Reinterpretation and Growth was positively correlated with the personality trait of optimism ($r = .41$) and negatively correlated with anxiety ($r = -.25$).

Sample

The nationwide sample consisted of students ($N = 129$) currently enrolled in college courses at traditional, 4-year institutions. Participant age ranged from 18 to 52 ($M = 23$; $SD = 6.14$). The sample was comprised of 31 percent male, 68 percent female, and 1 percent who identified their gender non-dichotomously. Participants were recruited from undergraduate psychology courses at a small southern university and through postings on various listservs targeted at students and student affairs professionals. All participants were enrolled in a drawing to receive a $25 Amazon gift card upon successful completion of the study.

After removing 20 results for non-completion, the final N was 109. Participants identified their gender as 35 percent male, 62 percent female, 1 percent non-dichotomous. Participant ethnicity was 14.7 percent African American, 70.6 percent Caucasian, 7.3 percent Hispanic or Latino, 3.7 percent Native American, and 3.7 percent Asian/Pacific Islander. It was determined through an analysis with G*Power 3.1 (Faul, Erdfelder, Buchner, & Lang, 2009) that sample sizes were not sufficient to meaningfully test for differences by gender or ethnicity across the 15 COPE subscales.

Analysis

Main model. We grouped subscales into four coping styles: approach, avoidant, social-contextual, and individual-contextual. Approach style subscales included Active Coping, Planning, Positive Reinterpretation and Growth, and Suppression of Competing Activities. Social-contextual styles consisted of Emotional Social Support, Instrumental Social Support, and Focus on Emotions. Avoidant styles included Behavioral Disengagement, Denial, Mental Disengagement, and Substance Use. Three scales were classified as individual-contextual style because of specific traits that allow them to be used to approach or avoid a subject.

Restraint was classified as individual-contextual because its language ("I hold off doing anything about it until the situation permits") indicates immediate avoidance but future action (which may or may not occur depending on an individual's dominant style). Thus, approach or avoidant-style individuals may make use of these strategies. Humor was similarly classified as individual-contextual, because it can be used to approach or avoid a topic.

Acceptance is commonly considered a step towards resolution. However, the specific COPE item wording ("I accept that this has happened and that it can't be changed") explicitly involves no action towards resolution and could indicate resignation. For this reason, Acceptance as measured by the COPE was classified as an individual-contextual style. Litman (2006) provides empirical evidence for this as well; Acceptance consistently loaded on the same factor as Humor and Restraint in their analysis.

Partial least squares structural equation modeling (PLS-SEM) was used to assess the model. When many researchers in social science fields think of SEM, they think exclusively of covariance-based SEM (CB-SEM), which attempts to minimize differences between empirical and theoretical covariance matrices (Hair, Ringle, & Sarstedt, 2011). In contrast, PLS-SEM focuses on maximizing the explanatory power of the model (Haenlein & Kaplan, 2004). Based on an algorithm first proposed by Wold (1985), PLS-SEM and PLS regression are widely used in many fields, including information systems, consumer behavior, marketing, and chemometrics (Peng & Lai, 2012; Wold, Sjöström, & Eriksson, 2001).

PLS-SEM differs from CB-SEM in two ways that make it a good fit for this analysis. The first is that PLS is free of distributional assumptions, meaning that it can be used even in the absence of multivariate normality (Hair, Hult, Ringle, & Sarstedt, 2013). P-values in PLS are instead determined through distributions built by resampling techniques such as bootstrapping or jackknifing (Hair, Ringle, & Sarstedt, 2011; Kock, 2015). Not all variables in this analysis were normally distributed, meaning CB-SEM could have given biased results.

The second difference is PLS-SEM's ability to function with small sample sizes. Kock (2015b) showed with a Monte Carlo analysis that factor-based PLS is capable of returning unbiased results with a sample size as small as 50. Hair, Ringle, and Sarstedt (2011) note that PLS-SEM can give accurate results with a much smaller N than CB-SEM and list a number of guidelines for minimum sample size; this study substantially exceeds all of them. Reinartz, Haenlein, and Henseler (2009) compared the power of PLS-SEM and CB-SEM across a wide variety of conditions. In the condition most similar to this analysis (N=100, 4 indicators with loadings of .7), they found the power of CB-SEM to detect an effect size of $\beta = .30$ was only .51, while the power of PLS-SEM was .85. The sample size of this study is thus too small for use in CB-SEM.

Some sources consider CB-SEM more appropriate than PLS-SEM for testing theoretical relationships (Hair, Ringle, & Sarstedt, 2011). However, this preference depends upon two factors: first, that the data meet CB-SEM assumptions, and second, that composite-based PLS is used (Dijkstra & Henseler, 2015). Since this data is inappropriate for use in CB-SEM due to both sample size and normality of

distribution, and since this analysis uses factor-based PLS rather than composite-based, PLS-SEM is clearly the most appropriate method.

First stage. The two-stage approach for model building was selected because of its greater consistency of path estimates than the repeated indicators approach (Wilson & Henseler, 2007). In the two-stage approach, first-order latent variables (LVs) are estimated from indicators; second-order latent variables are then constructed from specific combinations of the first-order latent variables. This method creates a hierarchical model such as the one reflected in Figure 1 (Becker, Klein, & Wetzels, 2012). The first stage of our model thus consisted of sequentially estimating coping subscale latent variables from individual items with the software WarpPLS 5.0 (Kock, 2015). The outer model analysis algorithm in PLS determines the method used to estimate LVs from items. Factor-Based PLS Type CFM1 was chosen because of its ability to correct for measurement error and superior accuracy to composite-based methods at low sample sizes (Kock, 2015b). The inner (structural) model analysis algorithm was Linear. The Stable3 resampling method was chosen for its ability to yield consistent P-values and more precise estimation of standard errors (Kock, 2014). All LVs were considered to be reflective.

In the interest of space, we do not report full loading information on all 60 items here. All loadings ($\bar{X}$=.713, s = .131; $p < .001$ for all) fell within acceptable bounds as recommended by Hair, Ringle, and Sarstedt (2011), with two exceptions. Item 1 for Mental Disengagement ("I turn to work or other substitute activities to take my mind off things") loaded at .347, and item 3 for Suppression of Competing Activities ("I

try hard to prevent other things from interfering with my efforts at dealing with this") loaded at .365. Given both items' strong theoretical connections to their subscales, it was decided to retain them on a provisional basis. Both are included in the final model.

Second stage. The second stage of our model consisted of estimating second-level coping scores from subscale LVs. References to the coping style itself will be in lower case (avoidance style), while references to the latent construct estimates will be capitalized (Avoidance). PLS Mode A was chosen for the outer model analysis algorithm because a) the first stage factor-based method already corrected for measurement error, and b) it is considered standard for reflective models (Kock, 2015). All other software settings were identical to the first stage.

PLS-SEM, unlike CB-SEM, can only estimate unidirectional relationships. Since regression coefficients, unlike correlation coefficients, differ depending upon the direction of the regression, correctly specifying the path direction is a point of concern. It was hypothesized that individual-contextual and social-contextual styles would predict approach and avoidance, but empirical evidence was desirable.

One property of nonlinear estimation methods in PLS is that correlation predictive ability can differ in strength (meaning that prediction error will be larger or smaller) based on the direction of the relationship. Thus, the ratio between coefficients of the same relationship in opposite directions can be used to infer a direction in PLS models (Kock, 2015). Nonlinear Warp2 and Warp3 bivariate causal direction ratios were used to test path directions, validating a model with paths from Individual-Contextual to Social-

Contextual, Approach, and Avoidance, paths from Social-Contextual to Approach and Avoidance, and a path from Approach to Avoidance. Our final model had acceptable ratios (values ≤ 1.3 or with $p > .05$ for either algorithm) for all paths.

Religious coping was not related to any other scale and was removed from analysis, a finding that replicates previous research (Fortune, Richards, Griffiths, & Main, 2002; Litman, 2006; Lyne & Rogers, 2000). Table 1 contains indicator structure loadings and cross loadings for retained subscales. All loadings were significant at $p < .001$. Parentheses around a loading indicate the category to which that subscale was assigned. All values fell within acceptable ranges for exploratory research as recommended by Hair, Ringle, and Sarstedt (2011).

Model variance, collinearity, and goodness-of-fit statistics were acceptable to ideal. The model had an average path coefficient of .399 ($p < .001$), average R^2 of .325 ($p < .001$), and average adjusted R^2 of .313 ($p < .001$). Table 2 shows collinearity and goodness-of-fit statistics along with recommended values from Kock (2015).

Reliability and validity. Table 3 shows latent variable coefficients. Our measurement of reliability here is composite reliability, also known as the Dillon-Goldstein rho (P_{DG}). P_{DG} is generally considered more suitable than Cronbach's alpha for PLS-SEM, as it does not assume all indicators of an LV are equally reliable (Dillon & Goldstein, 1984; Peterson & Yeolib, 2013). All values are higher than the minimum of .7 recommended by Hair, Ringle, and Sarstedt (2011).

Average variance extracted (AVE) values are measures of convergent validity and represent the amount of indicator variance explained by the LV. All variables were above the minimum value of .5 recommended by Hair, Ringle, and Sarstedt (2011). Discriminant validity was assessed through the Fornell-Larcker criterion, which states that the square root of each construct's AVE should be higher than its correlation with any other construct (Fornell & Larcker, 1981). All LVs exceeded this criterion, indicating acceptable discriminant validity.

Henseler, Ringle, and Sarstedt (2015) recently discussed several versions of a criterion for discriminant validity called HTMT that is considerably more rigorous than Fornell-Larcker. In a Monte Carlo analysis, they showed that the criteria HTMT.85 correctly identified a lack of discriminant validity in an average of 99.9 percent of cases across a wide range of conditions. The HTMT value for this model, .517, is substantially lower than the criteria of .85, meaning it has excellent discriminant validity according to the strictest current criteria.

Stone-Geisser's Q^2 is a cross-validated R^2 measured through predicting blindfolded samples. Values above zero are considered indicative of predictive validity; interpretation is otherwise similar to R^2 (Hair, Ringle, & Sarstedt, 2011; Kock, 2015). Approach, Social, and Avoidance all have values of Q^2 highly similar to R^2, providing evidence for the model's predictive validity (since no construct predicts Individual-Contextual, Q^2 is not a relevant statistic for that LV).

Path model. Figure 2 shows the final model with standardized regression coefficients and p-values. We found significant direct relationships between all constructs. Indirect effects were assessed through the method described by Bollen and

Stine (1990). Five significant indirect relationships were found. For ease of calculation, Table 4 includes total effects and f^2 effect sizes for all LVs.

These findings explain the apparent statistical suppression effect between approach and avoidant coping. Use of approach and avoidant styles are directly negatively correlated, but indirectly positively correlated. That is: levels of all four coping styles rise together, but avoidant coping is partially suppressed by the increased levels of approach coping. This mechanism results in avoidant coping increasing more slowly than approach. Bivariate correlations between approach and avoidant styles then show a weak positive correlation, but when modeled in an SEM where indirect relationships may be studied, the direct negative relationship is revealed. In other words, when an individual increases reliance on one coping style, they rely less on its alternative.

Table 1

Structural loadings and cross-loadings

Subscale	Approach	Social	Avoidant	Contextual
Pos Reinterpretation and Growth	(.781)	.570	.108	.280
Active Coping	(.902)	.548	.168	.437
Suppression of Competing Act.	(.831)	.602	.408	.449
Planning	(.888)	.506	.064	.371
Focus on Emotions	.362	(.835)	.469	.384
Instrumental Social Support	.421	(.828)	.155	.238
Emotional Social Support	.388	(.870)	.191	.213
Mental Disengagement	.303	.489	(.760)	.351
Denial	.245	.450	(.869)	.328
Behavioral Disengagement	.144	.465	(.886)	.264
Substance Use	.054	.292	(.732)	.177
Humor	.445	.282	.482	(.734)
Acceptance	.591	.207	.304	(.811)
Restraint	.466	.298	.420	(.731)

Table 2

Model Collinearity and GoF

Statistic	Value	Recommended (Kock, 2015)
Average block VIF	1.460	< 5 acceptable, ≤ 3.3 ideal
Average full collinearity VIF	1.874	< 5 acceptable, ≤ 3.3 ideal
Tenenhaus' GoF	0.467	≥ .36 considered large
R^2 Contribution Ratio	0.935	> .9 acceptable, 1 ideal
Statistical Suppression Ratio	1.000	≥ .7 acceptable
NLBCDR[1]	0.917	≥ .7 acceptable

[1]Nonlinear bivariate causality direction ratio

Table 3

Latent Variable Coefficients

Statistic	Approach	Social-C	Avoidant	Indiv-C
R^2	0.495	0.120	0.362	--
Adjusted R^2	0.485	0.112	0.343	--
Composite reliability	0.914	0.882	0.887	0.803
AVE	0.726	0.714	0.663	0.577
AFVIF[a]	2.126	1.387	1.567	2.416
Q^2	0.499	0.125	0.365	--
Normality: RJB[b]	Yes	Yes	No	Yes

[a]Average full collinearity VIF
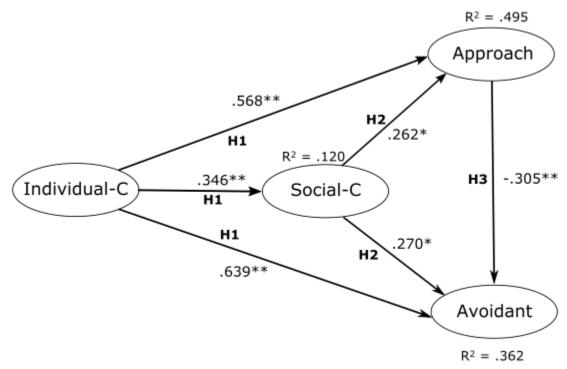[b]RobustJarque-Bera test of normality

Figure 2.Full path model with standardized regression coefficients and *p* values.
Notes: **p<.001; *p = .002

Discussion

All proposed hypotheses were confirmed. We found a significant positive relationship between individual-contextual coping and all other coping styles. Individual-contextual coping includes a

number of coping strategies that we theorize individuals may use on a personal basis in

either an approach or avoidance fashion, depending on the individual and situation. A positive relationship between coping and all other styles makes theoretical sense, as we define contextual coping styles as categories of coping strategies that specifically defy simple categorization into the dichotomy of approach or avoidance.

Table 4

Regression coefficients and effect sizes for total effects

	Approach	Social-C	Avoidant
Social-Contextual	0.262		
f^2	(0.120)		
Avoidant	-0.305	0.190	
f^2	(0.073)	(0.067)	
Individual-Cntxtl	0.659	0.346	0.532
f^2	(0.434)	(0.120)	(0.283)

We also found a significant positive relationship between social-contextual coping and all other coping styles, confirming our second hypothesis. Social-contextual coping was found to be equally related to approach and avoidant coping, but somewhat more strongly related to individual-contextual coping. We thus conclude that we were correct to consider it more conceptually related to individual-contextual than approach. However, social-contextual coping was not so strongly related to individual-contextual that collapse the two types together could be justified. Like the conclusion from the first hypothesis, this result aligns well with existing theory, as we consider social-contextual coping to also be compatible with approach and avoidance styles, and related to but not a subset of individual-contextual coping as defined in this analysis. Other studies have also used the COPE to

conceptualize social coping in this manner (Litman, 2006).

Our final hypothesis, that there would be a significant negative relationship between approach and avoidance coping, was also confirmed. This result forms a meaningful contribution to the existing coping literature, because previous research has noted that approach and avoidance strategies are often found to have a positive relationship with one another (Carver, Scheier, & Weintraub, 1989; Litman, 2006). However, when modeling the styles as latent variables, the two are negatively correlated, a conclusion that fits better theoretically. It is our belief that individual and social-contextual coping were conflating variables in previous models, skewing the relationship between approach and avoidance. As an individual uses more approach coping

strategies, the likelihood they will use avoidance strategies lowers.

The proposed model presents evidence for conceptualizing certain coping styles as individual-contextual. Further, the subscales within the COPE fit very clearly with these coping categories and the COPE items into the individual subscales. The model had a global AVE value of .674, meaning that the second level model explained 67.4 percent of variance in coping subscale scores. This constitutes strong evidence for a hierarchical effect between coping style, coping type, and individual coping strategy.

The hierarchical effect means that the results of single-level analyses conducted directly on COPE items (as opposed to total subscale scores) should be interpreted cautiously. Such an analysis would make incorrect assumptions about the data variance structure. This would conflate the first and second level effects into a single level, biasing the model estimates.

The wide variety of individual item reliabilities presents an additional problem to previous work on the COPE. Our first stage analysis replicated the work of Carver, Scheier, and Weintraub (1989) in that item reliabilities were not approximately equal. Equality of reliabilities, known as essential τ-equivalence, means that each item is of approximately equal importance in estimating the true score (Vinzi, Trinchera, & Amato, 2010). It is rare for data to meet this standard, and violation of this assumption is the major reason measures such as P_{DG} and glb are more accurate estimates of reliability than Cronbach's alpha in virtually all circumstances (Sijtsma, 2009).

In the absence of essential τ-equivalence, summing raw scores cannot provide a trustworthy correction for measurement error. In this analysis, item subscale loadings varied from approximately .35 to .9. This is a lesser concern for an analysis that weights items based on their reliability, but weighting those items equally would create inaccurate estimates of total score.

This failure to account for differences in reliability between items is of greater practical concern than the first because the vast majority of COPE analyses have used summed raw scores for subscale scores. The exact amount of error introduced because of this procedure is currently unknown but potentially substantial. Even approaches that can typically correct for measurement error may produce suboptimal estimates if the indicators are the result of sum scores, as the analysis will then adjust for differences between subscales but not between items. We thus recommend that future researchers using the COPE a) consider the hierarchical effect when designing their analysis and b) avoid the use of summed raw scores.

The results of this study suggest wide ranging implications for college students and the professionals who work with them. The foremost of these implications is to understand coping is more than just approach and avoidance strategies. In fact, some strategies such as making jokes and waiting for a more appropriate time to act are actually contextual, meaning that the individual's situation and relationship with the stressor should be taken into consideration before making a judgment. This understanding could greatly impact the nature of services provided at a university or college level.

The ability to differentiate between coping styles more clearly with the introduction of the individual-contextual

coping category also allows student services professionals to gain a clearer picture of the student. This could lead to a more thorough and timely assessment of an individual student's situation and behavior and enhance student services overall.

Finally, the conclusion that an individual's perspective and context must be taken into account further displays the need for student services professionals to work from a student-centered perspective. An approach centered on the student allows the student to be seen in the context of their problem, but without sacrificing the importance of their strengths, the environment, their goals and plans. It allows for greater opportunities to develop meaningful relationships and provide greater options when moving toward resolution (Leplege, Gzil, Cammelli, Lefeve, Pachoud, & Ville, 2009). Rather than defining the problem for the student, this perspective places the student services professional in the role of developing a greater understanding of a student's beliefs and worldview before moving toward change.

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