



Conscientiousness and mindfulness in midlife coping: An assessment based on MIDUS II

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ABSTRACT

Research has demonstrated that conscientious individuals tend to engage in planful problem solving to cope with stressful situations. Likewise, mindful individuals tend to favour approach-based coping and are less likely to engage in avoidant coping strategies. To examine whether conscientiousness and mindfulness determined agentic coping behaviour, hierarchical linear regressions were conducted using data from 602 participants drawn from the National Survey of Midlife Development in the United States (MIDUS) Study II and MIDUS II Biomarker Project. Personality responses were derived from the five-factor model inventory, gathered at a single time-point. Results revealed that conscientiousness predicted problem-focused coping ($p < 0.001$; $\beta = 0.23$) and inversely predicted emotion-focused coping respectively ($p < 0.001$; $\beta = -0.14$), even after controlling for remaining Big Five and confounding variables. Mindfulness also predicted problem-focused coping ($p < 0.001$; $\beta = 0.21$). Neuroticism predicted emotion-focused coping ($p < 0.001$; $\beta = 0.40$). These findings suggest that conscientiousness and mindfulness may contribute to coping responses in potentially healthful ways, highlighting new evidence regarding the potential protective role of conscientiousness. Copyright © 2015 John Wiley & Sons, Ltd.

Introduction

Conscientious people appear to have better physical and mental health, although it is unclear precisely why this is the case. As a higher-order personality trait, conscientiousness is commonly said to comprise sub-traits such as competence, achievement striving, orderliness, self-control and deliberation (Javaras et al., 2012), all of which may contribute to better health. Research suggests that persons scoring high for conscientiousness experience less stress and better health than others because they were more likely to engage in positive health behaviours and had greater longevity (Friedman et al., 1993; Bogg & Roberts, 2004;

Grant & Langan-Fox, 2006; Murphy et al., 2013). While it is tempting to attribute the health benefits of conscientiousness to self-preserving behaviour and wise health choices, researchers have been unable to precisely account for the intervening mechanisms (Friedman, 2000). Most studies have suggested that conscientiousness may predict low stress exposure because conscientious persons plan for predictable stressors and avoid impulsive reactions by engaging in planful problem solving to cope with agentic stressors and use significantly less escape avoidance and self-blaming in coping across stressful situations than low conscientiousness persons (O'Brien & DeLongis, 1996). Conscientious individuals also experience less stress

(Bartley & Roesch, 2011; Murphy et al., 2013), suggesting greater task organization and successful prediction and avoidance of stressors.

Because coping style may be crucial to selecting and shaping stressful situations, individuals with distinct personality types may engage in different coping styles depending on environment and dispositional tendencies (Vollrath, 2001). Some studies have reported mixed associations between conscientiousness and stress outcomes. Boyce, Wood and Brown (2010) found that unemployed persons with high conscientiousness experienced greater distress than persons with low conscientiousness and highly conscientious persons tended to report higher well-being from increased income and associated unemployment with the lack of ability to utilize their unique strengths in the workplace. The same relationship was observed in challenge states during athletic performance goals (Cleveland, Finez, Blascovich, & Ginther, 2012) and in lower clinical knowledge acquisition in medical students, despite initial documented enhancement in pre-clinical knowledge (Ferguson et al., 2014). It appears that conscientiousness enhances performance across tasks when the context requires methodical and ordered thinking. However, conscientiousness may also reduce performance across tasks when creativity is required instead. Combined sub-traits like deliberation, responsibility, self-discipline and self-control might decrease stress exposure, and facets such as orderliness, perseverance and achievement striving might be counterproductive in situations with greater ambiguity or require flexibility for success (Shanahan, Hill, Roberts, Eccles, & Friedman, 2012).

Some studies examining task performance have found that higher levels of reported conscientiousness reflected greater feelings of tension during performance goals following negative feedback; conscientiousness could relate positively to performance through effort, and it could also relate negatively through tension (Cianci, Klein, & Seijts, 2010). This is because highly conscientious individuals tend to set greater personal goals than their low conscientious counterparts, believing they

could succeed at higher levels (Gellatly, 1996). Murphy et al. (2013) also concluded that higher conscientiousness may be harmful when a person faces failure. It may be that conscientious individuals sometimes experience greater pressure to achieve higher set challenges and goals. Therefore, conscientiousness may be detrimental during times of failure, in addition to being beneficial to wellness and longevity (Turiano, Chapman, Gruenewald, & Mroczek, 2015). Inhibitions arising from conscientiousness may not be so much a failure of personality then, but more an inability to cope with life stress. Definitions of coping emphasize efforts to prevent or diminish threat, harm and loss, or reduce associations with stress. These efforts include behavioural engagement (e.g. problem solving), behavioural disengagement (e.g. substance use), emotional expression and 'emotion-focused' activities such as exercise and relaxation (Carver & Connor-Smith, 2010; Weinstein, Brown, & Ryan, 2009). Because highly conscientious persons plan for predictable stressors and tend to avoid impulsivities that lead to problems, it is plausible to suppose that particular coping behaviours may affect longevity via negative relation to stress (Carver & Connor-Smith (2010).

Most of the research available on coping strategies tends to focus on two distinct categories in particular, which encapsulate a variety of behaviours: problem-focused coping and emotion-focused coping (Penley & Tomaka, 2002). Problem-focused coping describes any strategies utilized in reducing or eliminating stress, such as active coping, planning, suppressing competing activities, increasing applied effort or seeking social support (Kaiseler, Polman, & Nicholls, 2012). These strategies are known for proactively dealing directly with conditions triggering stress (Vollrath, 2001). High conscientiousness has been often associated with use of problem-focused coping strategies in athletes (Kaiseler et al., 2012) and police officers (Lau, Hem, Berg, Ekeberg, & Torgersen, 2006), because highly conscientious copers are known for facing stressors straight on, figuring

out what needs to be done, and carrying out plans to completion (O'Brien & DeLongis, 1996). Both conscientiousness and problem-focused coping behaviour are related to overall positive health outcomes (Penley, Tomaka, & Wiebe, 2002).

Emotion-focused coping regulates emotions accompanying interactions with stress (Vollrath, 2001) and describes strategies utilized towards emotional arousal and distress, such as seeking emotional-social support seeking, venting emotions, self-blaming, wishful thinking and humour (Kaiseler et al., 2012). Studies of emotion-centred coping concluded that writing about emotional responses to stress in evaluative ways leads to less-efficient heart rate habituation and recovery than from processing emotions in accepting manners (Low, Stanton, & Bower, 2008). Although it is evident that high conscientiousness exhibits a favourable stress and coping profile, lower conscientiousness, paired with higher neuroticism, reveals higher vulnerability to stress and has been associated with emotion-focused behaviour (Vollrath & Torgersen, 2000). Specific emotions such as anger and shame are also associated with greater emotion-focused coping and physiological arousal (Herrald & Tomaka, 2002).

Mindfulness has been defined as a process of drawing novel distinctions that lead to experiences of environmental sensitivity and enhanced awareness of perspectives while problem solving (Langer & Moldoveanu, 2000). In academic research, mindfulness has been divided into two general cohorts that appear to focus on either cognitive-trait mindfulness or therapeutic and meditative mindfulness. Dispositional mindfulness attributes trait-like proclivities to experience and expresses mindful qualities, such as non-judgement and equanimity, as well as behavioural tendencies like awareness (Vago & Silbersweig, 2012), and mindfulness-based meditation focuses on mindfulness as a primary or ancillary behavioural practice or treatment for medical conditions like CVD, diabetes, cancer and other chronic illnesses, which have been caused or exacerbated by lifestyle factors that utilize mindfulness-based

stress reduction (Thompson & Waltz, 2007). However, such practices have yielded mixed results (van den Hurk et al., 2011). Although mindfulness is often acknowledged in eastern religious practices like Buddhism and zazen, this is more or less another 'brand' of mindfulness, and mindfulness as a cognitive process is still studied separately from this context.

It has also been suggested that mindfulness is an adaptive coping strategy, the ability to separate one's self from the experience at hand by reducing emotional reactivity, predictive of enhanced parasympathetic influences by individuals who may utilize maladaptive strategies (Brown, Ryan, & Creswell, 2007; Mankus, Aldao, Kerns, Wright Mayville, & Mennin, 2013). Although improved well-being seems to be a recurrent theme, reports of higher levels of well-being by mindful individuals may be due to a tendency to appraise situations in non-threatening ways (Weinstein et al., 2009). Strong positive associations have been found between mindfulness and conscientiousness (Giluk, 2009; Latzman & Masuda, 2013), especially in context of dispositional or trait mindfulness. It has also been suggested that mindfulness may prevent psychopathological symptoms arising from personal disappointments and perceived failures associated with conscientiousness (Bergomi, Ströhle, Michalak, Funke, & Berking, 2013).

This study sought to examine whether conscientiousness and mindfulness determined agentic coping behaviour (i.e. problem-focused coping) as distinct from other types of coping (such as emotion-focused coping). Given that the construct of conscientiousness appears to have similar trait facets with that of mindfulness (Sternberg, 2000), and given the abundance of evidence links personality and coping and to lower stress, it seems plausible to hypothesize: (1) that conscientiousness would predict problem-focused coping while inversely predicting emotion-focused coping and (2) due to the mutual trait similarities between conscientiousness and mindfulness that mindfulness would be predictive of problem-focused coping. The personality measures used in the current study

elucidate the key aspects of conscientiousness, which were closely aligned with those drawn from Costa and McCrae's (1992) Big Five inventory.

Methods

Participants

Data were used from 602 English-speaking American adults drawn from a sample pool of 4963 respondents, aged 25 to 74 years, drawn from the National Survey of Midlife Development in the United States (MIDUS) Study II, conducted from 2004–2006, and from the 1255 respondents drawn from the MIDUS II Biomarker Project. MIDUS II (total response rate: 75%) was a follow-up of the original MIDUS study, conducted from 1995 to 1996, which yielded a sample of 7108 respondents. The participants of MIDUS II were invited to attend for an additional element, the Biomarker Project, which they attended for biological assessments. The Biomarker Project contains data from 1225 participants, 1054 from the longitudinal survey sample and 201 from the Milwaukee sample (Ryff, Seeman, & Weinstein, 2010; Ryff et al., 2012). Participants were recruited and data collected for MIDUS via telephone interviews and self-administered questionnaires.

Participants ranged in age from 34 to 84 years ($n = 602$; $M = 55.30$ years, $SD = 11.85$) and were composed of 45.5% males ($n = 274$) and 54.5% females ($n = 328$). Height (metres) and weight (kilogrammes) of each participant were measured by clinical staff, with continuous measure of body mass index (BMI) computed by dividing weight by height squared ($M = 29.29$ kg/m², $SD = 5.98$). A number ranging from 1 (no school/some grade school) to 12 (graduate or professional degree) was used to measure the educational attainment of each participant, in which the mean level of education was '3 or more years of college, no degree yet'. Eighty-four percent of the sample surveyed identified as Christian and 11.6% identified as non-religious. Response refusals and missing and incomplete data were removed from sample analysis.

Personality

All personality predictor variables were derived via the adjectival measures of the five-factor inventory assessed at MIDUS II (Zimprich, Allemand & Lachman, 2012). Each participant was asked to rate what extent each of the adjectives described them on a scale from 1 (not at all) to 4 (a lot). The measures consisted of the following: agreeableness (helpful, warm, caring, soft-hearted and sympathetic) five-item scale; openness to experience (creative, imaginative, intelligent, curious, sophisticated and adventurous) seven-item scale; conscientiousness (organized, responsible, hardworking and (not) careless) four-item scale; extroversion (outgoing, friendly, lively, active and talkative) five-item scale and neuroticism (moody, worrying, nervous and (not) calm) four-item scale. The conscientiousness scale used in MIDUS II was utilized in this study via the (organized, responsible, hardworking, (not) careless and thorough) five-item scale (Ryff et al., 2012). This Big Five scale has been used previously and has been shown to possess validity because of strong correlations with the NEO trait measures (Mroczek & Kolarz, 1998; Prenda & Lachman, 2001). Current reliability alpha (Cronbach's) in the present study sample, after controlling for additional variables, was 0.67 (conscientiousness), 0.80 (agreeableness), 0.75 (openness to experience), 0.75 (extraversion) and 0.75 (neuroticism).

Coping

The problem-focused coping predictor variable was assessed via a 12-item scale combining 'Positive Reinterpretation and Growth', 'Active Coping' and 'Planning' ($\alpha = 0.90$). Current reliability alpha (Cronbach's) in the present sample was 0.84. The emotion-focused coping predictor variable was assessed via a 12-item scale combining 'Focus on and venting of emotion', 'Denial' and 'Behavioral disengagement' ($\alpha = 0.83$). Current reliability alpha (Cronbach's) in the present sample was 0.63. Table 1 presents the means and standard deviations of conscientiousness by coping style.

Table 1: Descriptive results table of coping behaviours and conscientiousness

n = 602	Mean	SD
Problem-focused coping	37.56	6.09
Emotion-focused coping	22.55	5.51
Age in years	55.54	11.78
Education	7.73	2.51
Body mass index	29.30	6.11
Self-evaluated physical health	2.47	1.00
Mindfulness	33.94	6.03
Extraversion	3.08	0.58
Agreeableness	3.42	0.51
Open to experience	2.86	0.56
Neuroticism	2.05	0.61
Conscientiousness	3.40	0.47

Table 2: Descriptive results table of coping behaviours and mindfulness

n = 602	Mean	SD
Problem-focused coping	37.56	6.09
Emotion-focused coping	22.55	5.51
Age in years	55.57	11.80
Education	7.73	2.51
Body mass index	29.30	6.12
Self-evaluated physical health	2.47	1.00
Extraversion	3.08	0.58
Agreeableness	3.42	0.51
Open to experience	2.87	0.56
Neuroticism	2.05	0.61
Conscientiousness	3.39	0.47
Mindfulness	33.94	6.03

Mindfulness

Mindfulness was a new variable added to MIDUS II and was assessed via a bespoke self-administered questionnaire, developed by the MIDUS authors. Each participant was asked to rate to what extent he or she agreed to each of the statements described on a scale from 1 (strongly agree) to 5 (strongly disagree): 'Because of your religion or spirituality, do you try to be...': 'more engaged in the present moment'; 'more sensitive to the feelings of others'; 'more receptive to new ideas'; 'a better listener'; 'a more patient person'; 'more aware of small changes in my environment'; 'more tolerant of differences'; 'more aware of different ways to solve problems' and 'more likely to perceive things in new ways' ($\alpha = 0.94$). Current reliability alpha (Cronbach's) in the present sample was 0.93. Table 2 presents the means and standard deviations of mindfulness by coping style.

Statistical analyses

The data were analysed using SPSS (IBM, version 21, SPSS Inc., Chicago, IL, USA). Both conscientiousness and mindfulness were computed in separate analyses. Hierarchical linear regression analyses were used to measure any associations

between conscientiousness and/or mindfulness with both emotion-focused and problem-focused coping responses. For both coping responses, each model adjusted for a number of variables, sex, age, education level, religious preference, BMI, self-evaluated physical health and mindfulness was entered into the first step of the model, followed by the five-factor model personality types extraversion, agreeableness, openness to experience and neuroticism. Conscientiousness was entered into the third step of the model. Effects sizes were presented as Cohen's f^2 , the partial values for multiple regression effects with values of 0.02, 0.15 and 0.35 being taken to represent small, medium and large effect sizes respectively (Cohen, 1988; Cohen, 1992).

Results

In order to examine if conscientiousness predicted problem-focused coping

For the regression analyses examining the association between conscientiousness and problem-focused coping, the control variables entered in the first block explained 14% of the variance in problem-focused coping, $F(6, 595) = 6.50$, $p < 0.001$, adjusted $R^2 = 0.144$. The addition of

the personality variables in the second block leads to a significant F change ($p < 0.001$), with the model now explaining 31% of the variance in problem-focused coping (adjusted $R^2 = 0.31$), $F(11, 590) = 25.79$, $p < 0.001$, an increase of 17% in explained variance. Finally, the addition of conscientiousness in the final step also leads to a significant F change ($p < 0.001$), where conscientiousness explained a further 4% of the variance in problem-focused coping, $F(12, 589) = 28.17$, $p < 0.001$, adjusted $R^2 = 0.35$. Overall, in the final model, as can be seen in Table 3, mindfulness ($\beta = +0.21$), openness to experience ($\beta = +0.27$) and conscientiousness ($\beta = +0.23$) were the strongest predictors of problem-focused coping with all three measures positively correlated with problem-focused coping. Analyses for problem-focused coping yielded a large effect size ($f^2 = 0.33$).

In order to examine if conscientiousness predicted emotion-focused coping

For the regression analyses examining the association between conscientiousness and emotion-focused

coping, the control variables entered in the first block explained 5.1% of the variance in problem-focused coping, $F(7, 594) = 5.57$, $p < 0.001$, adjusted $R^2 = 0.051$. The addition of the personality variables in the second block leads to a significant F change ($p < 0.001$), with the model now explaining 23.7% of the variance in emotion-focused coping (adjusted $R^2 = 0.24$), $F(11, 590) = 18.02$, $p < 0.001$, an increase of 18.6% in explained variance. Finally, the addition of conscientiousness in the final step also leads to a significant F change ($p < 0.001$), where conscientiousness explained a further 1.4% of the variance in emotion-focused coping, $F(12, 589) = 17.76$, $p < 0.01$, adjusted $R^2 = 0.25$. Overall, in the final model, as can be seen in Table 3, neuroticism ($\beta = +0.17$) was the strongest predictor of emotion-focused coping, along with extraversion ($\beta = +0.38$) and self-evaluated physical health ($\beta = +0.11$), as three measures correlated positively with emotion-focused coping, while conscientiousness ($\beta = -0.14$) had a negative correlation. Analyses for emotion-focused coping yielded a medium to large effect size ($f^2 = 0.28$) (Figure 1).

Table 3: Descriptive results table of coping behaviours and personality

	Problem-focused coping (n = 605)				Emotion-focused coping (n = 602)			
	B	β	t	p	B	β	t	p
Sex	0.580	0.047	1.419	0.156	-0.541	-0.049	-1.362	0.174
Age in years	0.030	0.057	1.705	0.089	-0.022	-0.047	-1.307	0.192
Education	0.019	0.008	0.235	0.814	-0.037	-0.017	-0.470	0.639
Religion	0.21	0.044	1.344	0.180	-0.019	-0.044	-1.230	0.219
Body mass index	0.028	0.028	0.849	0.396	0.040	0.045	1.247	0.213
Self-evaluated physical health	-0.497	-0.082	-2.328	0.020*	0.621	0.113	2.990	0.003**
Mindfulness	0.215	0.212	5.944	0.000***	0.036	0.039	1.014	0.311
Extraversion	1.132	0.108	2.529	0.012*	1.601	0.168	3.677	0.000***
Agreeableness	-0.239	-0.020	-0.482	0.630	1.073	0.099	2.224	0.027*
Open to experience	2.877	0.267	6.479	0.000***	-1.723	-0.176	-3.974	0.000***
Neuroticism	-0.862	-0.086	-2.479	0.013*	3.451	0.380	10.219	0.000***
Conscientiousness	2.957	0.230	6.102	0.000***	-1.593	-0.137	-3.383	0.001

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

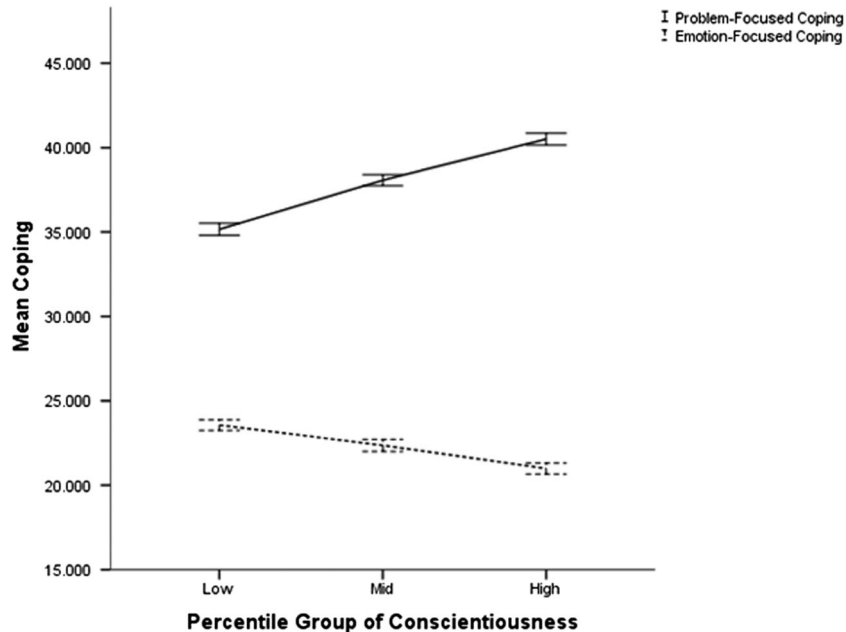


Figure 1: Illustration of mean coping responses by tertiles of conscientiousness

In order to examine if mindfulness predicted problem-focused coping

Hierarchical linear regression analyses were also used to measure the association between mindfulness and both emotion-focused and problem-focused coping responses. For both coping responses, each model adjusted for sex, age, education level, religious preference, BMI and self-evaluated physical health in the first step, followed by extraversion, agreeableness, openness to experience, neuroticism and conscientiousness. Mindfulness was entered into the third step of the model.

For the regression analyses examining the association between mindfulness and problem-focused coping, the control variables entered in the first block explained 5.2% of the variance in problem-focused coping, $F(6, 595) = 6.50$, $p < 0.001$, adjusted $R^2 = 0.052$. The addition of the personality variables in the second block leads to a significant F change ($p < 0.001$), with the model now explaining 31.4% of the variance in problem-focused coping (adjusted $R^2 = 0.31$), $F(11, 590) = 25.96$, $p < 0.001$, an increase of 26.2% in explained

variance. Finally, the addition of mindfulness in the final step also leads to a significant F change ($p < 0.001$), where mindfulness explained a further 3.8% of the variance in emotion-focused coping, $F(12, 589) = 28.17$, $p < 0.001$, adjusted $R^2 = 0.35$. Overall, in the final model, as can be seen in Table 4, openness to experience ($\beta = +0.26$), conscientiousness ($\beta = +0.23$) and mindfulness ($\beta = +0.21$) were the strongest predictors of problem-focused coping with all three measures positively correlating with problem-focused coping. Analyses yielded a very large effect size ($f^2 = 0.48$).

In order to examine if mindfulness predicted emotion-focused coping

For the regression analyses examining the association between mindfulness and emotion-focused coping, the control variables entered in the first block explained 4.8% of the variance in problem-focused coping, $F(6, 595) = 6.10$, $p < 0.001$, adjusted $R^2 = 0.06$. The addition of the personality variables in the second block leads to a significant F change ($p < 0.001$), with the model now

Table 4: Descriptive results table of coping behaviours and mindfulness

(n = 602)	Problem-focused coping				Emotion-focused coping			
	B	β	t	p	B	β	t	p
Sex	0.565	0.046	1.382	0.167	-0.541	-0.049	-1.362	0.174
Age in years	-0.029	0.055	1.651	0.099	-0.022	-0.047	-1.307	0.192
Education	0.015	0.006	0.184	0.854	-0.037	-0.017	-0.470	0.639
Religion	0.019	0.040	1.219	0.223	-0.019	-0.044	-1.230	0.219
Body mass index	0.027	0.027	0.819	0.413	0.040	0.045	1.247	0.213
Self-evaluated physical health	-0.510	-0.084	-2.385	0.017*	0.621	0.113	2.990	0.003**
Extraversion	1.170	0.111	2.612	0.009**	1.601	0.168	3.677	0.000***
Agreeableness	-0.212	-0.018	-0.428	0.669	1.073	0.099	2.224	0.027*
Open to experience	2.847	0.263	6.382	0.000***	-1.723	-0.176	-3.974	0.000***
Neuroticism	-0.845	-0.084	-2.431	0.015*	3.451	0.380	10.219	0.000***
Conscientiousness	2.949	0.230	6.086	0.000***	-1.593	-0.137	-3.383	0.001**
Mindfulness	0.216	0.214	5.978	0.000***	0.036	0.039	1.014	0.311

* $p < 0.05$.** $p < 0.01$.*** $p < 0.001$.

explaining 25.1% of the variance in emotion-focused coping (adjusted $R^2 = 0.25$), $F(11, 590) = 19.28$, $p < 0.001$, an increase of 20.6% in explained variance. Finally, the addition of mindfulness in the final step also leads to no significant F change ($p > 0.05$), where mindfulness explained 0% of the variance in emotion-focused coping, $F(12, 589) = 17.76$, $p > 0.05$, adjusted $R^2 = 0.25$. Overall, in the final model, as can be seen in Table 4, neuroticism ($\beta = +0.38$) was the strongest predictors of problem-focused coping, along with extraversion ($\beta = +0.17$) and self-evaluated physical health ($\beta = +0.11$), as three measures positively correlated with emotion-focused coping, while conscientiousness ($\beta = -0.14$) had a negative correlation. Analyses yielded a medium to large effect size ($f^2 = 0.28$) (Figure 2).

In order to examine if conscientiousness predicted problem-focused coping without mindfulness

In order to confirm these results, a separate set of hierarchical linear regressions was conducted without mindfulness as a model variable. Descriptive statistics yielded the same set of means and standard

deviations as the original regression sets, with the exception of the mindfulness variable (Table 1).

For the regression analyses examining the association between conscientiousness and problem-focused coping, the control variables entered in the first block explained 5.2% of the variance in problem-focused coping, $F(6, 595) = 6.50$, $p < 0.001$, adjusted $R^2 = 0.052$. The addition of the personality variables in the second block leads to a significant F change ($p < 0.001$), with the model now explaining 27.9% of the variance in problem-focused coping (adjusted $R^2 = 0.28$), $F(10, 591) = 24.31$, $p < 0.001$, an increase of 22.7% in explained variance. Finally, the addition of conscientiousness in the final step also leads to a significant F change ($p < 0.001$), where conscientiousness explained a further 3.5% of the variance in problem-focused coping, $F(11, 590) = 25.96$, $p < 0.001$, adjusted $R^2 = 0.31$. Overall, in the final model, as can be seen in Table 5, conscientiousness ($\beta = +0.21$), openness to experience ($\beta = +0.30$) and extraversion ($\beta = +0.11$) were the strongest predictors of problem-focused coping with all three measures positively associated with problem-focused coping. Analyses yielded a large effect size ($f^2 = 0.39$).

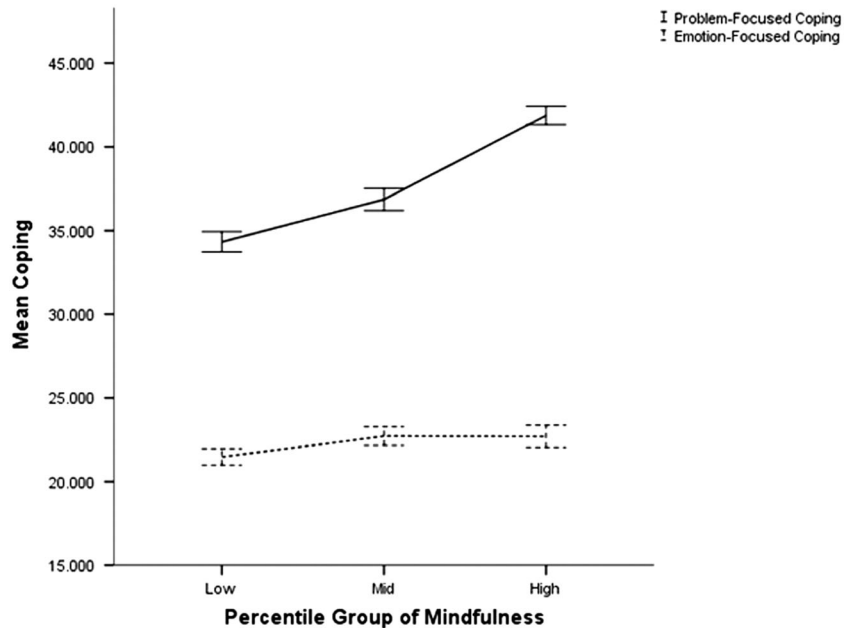


Figure 2: Illustration of mean coping responses by tertiles of mindfulness

Table 5: Descriptive results table of coping behaviours and personality (controlled for mindfulness)

n = 602	Problem-focused coping				Emotion-focused coping			
	B	β	t	p	B	β	t	p
Sex	0.533	0.044	1.266	0.206	-0.574	-0.049	-1.376	0.169
Age in years	0.027	0.053	1.537	0.125	-0.022	-0.048	-1.319	0.188
Education	0.003	0.001	0.031	0.975	-0.039	-0.018	-0.495	0.620
Religion	0.015	0.033	0.955	0.340	-0.019	-0.045	-1.271	0.204
Body mass index	0.014	0.014	0.397	0.691	0.038	0.042	1.180	0.238
Self-evaluated physical health	-0.526	-0.087	-2.392	0.017*	0.618	0.113	2.977	0.003**
Extraversion	1.189	0.113	2.579	0.010*	1.604	0.169	3.684	0.000***
Agreeableness	0.629	0.052	1.285	0.199	1.211	0.111	2.619	0.009**
Open to experience	3.206	0.296	7.048	0.000***	-1.664	-0.170	-3.873	0.000***
Neuroticism	-0.716	-0.071	-2.006	0.045*	3.473	0.383	10.302	0.000***
Conscientiousness	2.739	0.213	5.507	0.000***	-1.628	-0.140	-3.465	0.001**

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

In order to examine if conscientiousness predicted emotion-focused coping without mindfulness

For the regression analyses examining the association between conscientiousness and emotion-

focused coping, the control variables entered in the first block explained 4.8% of the variance in emotion-focused coping, $F(6, 595) = 6.10$, $p < 0.001$, adjusted $R^2 = 0.048$. The addition of the personality variables in the second block leads

to a significant F change ($p < 0.001$), with the model now explaining 23.7% of the variance in emotion-focused coping (adjusted $R^2 = 0.24$), $F(10, 591) = 19.64$, $p < 0.001$, an increase of 18.9% in explained variance. Finally, the addition of conscientiousness in the final step also leads to a significant F change ($p < 0.001$), where conscientiousness explained a further 1.4% of the variance in emotion-focused coping, $F(11, 590) = 19.28$, $p < 0.001$, adjusted $R^2 = 0.25$. Overall, in the final model, as can be seen in Table 5, neuroticism ($\beta = +0.38$) was the strongest predictor of emotion-focused coping, along with extraversion ($\beta = +0.17$) and self-evaluated physical health ($\beta = +0.11$), as three measures positively correlated with emotion-focused coping, while conscientiousness ($\beta = -0.14$) had a negative correlation. Analyses yielded a medium to large effect size ($f^2 = 0.28$).

Discussion

The present study reaffirms the available research on the relationship between conscientiousness and coping behaviour. Results revealed that conscientiousness predicted problem-focused coping and inversely predicted emotion-focused coping respectively, even after controlling for remaining Big Five and confounding variables. Conscientiousness has long been positively predictive of problem-focused coping (Penley & Tomaka, 2002; Connor-Smith & Flachsbart, 2007), and these findings are consistent with past research on conscientiousness, problem-focused coping behaviour and encountering stress (Kaiseler et al., 2012). The results observed in the present findings extend upon previous research; the behaviour patterns between conscientiousness and coping behaviours have been observed already in university level students in singular university populations (Watson & Hubbard, 1996; Penley & Tomaka, 2002; Bartley & Roesch, 2011), while the current analysis utilized a large, multi-year national population composed of mid-aged American adults. This study also highlights

conscientiousness in health-relevant ways, positing the notion that highly conscientious people may be well placed to deal with stress. McEwen (1998) suggests that conscientious persons live longer and have better health because their basal cortisol is lower during non-stressful situations and greater cortisol reactivity may aid in anticipation, coping and responses—better adaptation—to stressful situations. Because the present study had no biometric data with which to compare with the personality and coping variables, no associations with cortisol could be elucidated. While higher conscientiousness may be connected with greater stress resilience, further methodologically rigorous research is required to expand upon the present findings.

This study also provided new research on the relationship between mindfulness and coping behaviour. Consistent with previous research (Weinstein et al., 2009), mindfulness was found to be predictive of problem-focused coping behaviour. Given these findings and past research highlighting the healthful benefits of problem-focused coping behaviour, mindfulness may be preventive of psychopathological symptoms when perceived failure and disappointment occur (Bergomi et al., 2013). Past research has also shown that mindfulness-focused activities, such as breathing exercises and meditation, have been associated with stress reduction and decreased resting heart rate, cortisol and serum cholesterol levels, and less alcohol and tobacco use (Barnes & Orme-Johnson, 2006). However, some researchers contest that such evidence, if any, would be relegated to dispositional mindfulness rather than the practice of mindfulness-based meditation activity (Díaz & Lopes, 2014). Additionally, MIDUS research has also drawn associations between the present mindfulness variable and with persistence in goal striving, which is a trait quality of conscientiousness and problem-focused coping (Davis, 2013). However, this study was conducted in the context of social well-being and the development of self-regulatory attention skills. The present findings suggest that conscientiousness

and mindfulness may contribute to coping responses in potentially healthful ways and highlight potentially new evidence for the protective role of mindfulness in stressful situations.

In conducting this analysis, new questions arose in regard to the definition of the mindfulness variable. As this was a new variable added to the MIDUS II survey, there is no previous data with which to compare it with MIDUS I. Survey questions regarding meditative practices, for both therapeutic and religious contexts, existed in both datasets. However, in MIDUS II, the measure of mindfulness was explicitly contextualized in terms of religion and spirituality. Specifically, the items on mindfulness invited participants to respond to questions beginning with the phrase, 'Because of your religion or spirituality...' This phrasing served to restrict the measure to that of religious and/or spiritual mindfulness, and respondents who practised mindfulness for other reasons should not logically have reported doing so in response to such questioning. Not only was the measure restrictive, it was also highly idiosyncratic. Little previous academic research into mindfulness and health has embedded a spiritual definition of mindfulness into their measures. Most, in fact, refer to the general definitions involving focus on the present moment and acuity to one's surroundings. For this reason, it is now difficult to deduce whether or not the MIDUS dataset is an externally valid representation of true mindful behaviour, insofar as it is unclear whether this measure of mindfulness is at all comparable with those used in other studies. Therefore, it is difficult to interpret the true measure of mindfulness in this study, and consequently these results cannot easily be generalized.

Limitations

The present study had several limitations and suggestions for further directions of research. While the personality measure used in MDUS is considered reliable, it has been unable to measure the individual sub-facets that comprise trait conscientiousness.

Therefore, the findings in this study cannot be further examined in terms of their individual contributions to the results. Previous research has posited that certain characteristics of conscientiousness may be more influential on preferred coping behaviours than others and vary the overall impact (LePine, Colquitt, & Erez, 2000; Shanahan *et al.*, 2012). Although a number of variables were controlled for in this analysis to eliminate any confounding influences, future research would benefit by the inclusion of a stress task. After controlling for demography and personality influences, a small sample size remained with no haemodynamic data (i.e. blood pressure) to cross-analyse. Research has established that persons high in conscientiousness exhibit exaggerated haemodynamic responses in certain situations by examining the stress hormone cortisol (Garcia-Banda *et al.*, 2011; Savic, Knezevic, Damjanovic, Spiric, & Matic, 2012) rather than blood pressure or other functions of the cardiovascular system so further inquiry, in addition to a larger complete sample, would be beneficial.

Additionally, it is unknown whether the religio-spiritual context of the mindfulness measure used by MIDUS may have delineated the validity of the measure within the sample. Mindfulness can be a cognitive construct by which a person can, by awareness and observation, contextualize their environment. Different results may have arisen because of the objective wording of the mindfulness questions chosen by MIDUS. A study utilizing an inventory specifically for dispositional mindfulness may be more reflective of a psychological and health context; perhaps a trait-based inventory like the Five Facet Mindfulness Questionnaire, a 39-point inventory based on a factor analytic study of five mindfulness questionnaires (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006), would prove a more accurate measure. The Mindfulness Attention Awareness Scale (MAAS; Brown & Ryan, 2003) is another trait measure scale developed for this purpose. Use of these types of instruments would not only more accurately reflect trait mindfulness but would

also be a fairer representation of mindfulness, and more evaluative of participants who do not contextualize these behaviours through a spiritual lens, or even identify as religious or spiritual at all.

Finally, several questions from the Five Facet Mindfulness Questionnaire and MAAS draw parallels with the conscientiousness inventory of the NEO-PI-R (Costa & McCrae, 1992). However, this may be an indication that mindfulness, as a measure, is in reality just an alternative, attenuated measure for conscientiousness and the two have become conflated. In a study conducted by Brown and Ryan (2003) regarding the role of mindfulness in psychological well-being using the MAAS, neuroticism was found to be inversely correlated with trait mindfulness. Such results, however, were not replicated in this study population. Further investigation of the validity of these measures, as well as a scale in MIDUS measuring dispositional rather than spiritual mindfulness, would be helpful.

Conclusions

Limitations withstanding, the present findings add to and reaffirm the current available literature on personality and coping behaviour. This study conclusively suggests that conscientiousness (and, possibly, mindfulness) may predict problem-focused coping behaviour. However, given the narrow (spiritual) definition of mindfulness as is constituted by MIDUS, its construct validity is unclear. If mindfulness plays a role in the association between conscientiousness and good health, then further research with a more rigorous measure will be needed to elucidate the relevant processes.

These findings are further confirmed by an inverse relationship between conscientiousness and emotion-focused coping behaviour. In addition to the positive relationship between neuroticism and emotion-focused coping behaviour, such findings have confirmed previous research and strengthened the notion that conscientiousness and neuroticism may be the biggest predictors of coping behaviour (Watson & Hubbard, 1996).

This study also offers potential importance to healthfulness and healthful behaviours, of which conscientiousness seems to be a central predictor and possible moderator (Turiano, Whiteman, Hampson, Roberts & Mroczek, 2012). Lastly, this study highlights the potential importance of coping in healthful behaviours and stress adaptation. The replication of these findings in a large national cohort of middle-aged, non-academic adults contributes to the current literature on the relationship between conscientiousness and problem-focused coping and strengthens the argument that personality is predictive of coping behaviour and raises a need for further exploration of the role of mindfulness within this interaction.

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Conflicts of interest statement

There are no reported potential or actual conflicting interests involved in this research.

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