

ORIGINAL ARTICLE

**COPING STYLES AND STROOP TEST IN NON-CLINICAL SAMPLE: EXPLORING THE ASSOCIATIONS AND PREDICTORS OF COGNITIVE STYLES**

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**Abstract**

**Objective:** Literatures on factors influencing performance of the Stroop interference have been elusive on coping styles. Past investigations of coping influence on Stroop test have been indirect and inconclusive due to variability of multidimensional coping models and application of different Stroop test. The concept of constricted versus flexible or broad cognitive style have linked personality and coping styles to Stroop performance. The objective of this study was to determine the associations of coping styles with Stroop resistance towards interference (Stroop RI) and subsequently determine the predictors of Stroop performance. **Methods:** This was a cross-sectional community research design study with purposive sampling. In this study, the self-administered Brief COPE inventory questionnaires and Stroop Test were performed among 205 undergraduate medical students. **Results:** Findings revealed that behavioural disengagement ( $r=-0.361$ ), dysfunctional coping ( $r=-0.355$ ), self-blame ( $r = 0.222$ ), and substance abuse ( $r = -0.173$ ) showed negative correlation and proven strong association with Stroop RI. Further multiple regression analyses identified behavioural disengagement ( $R^2 = 0.13$ ), and dysfunctional coping ( $R^2 = 0.024$ ) as significant predictors for interference. **Conclusion:** Coping styles have implication on Stroop test exhibited in varied cognitive styles. Integrating coping styles factor on Stroop test has glimpsed the future direction of other neuropsychological assessment batteries on the importance of profiling individualistic baseline norms. *ASEAN Journal of Psychiatry, Vol. 16 (1): January – June 2015: XX XX.*

**Keywords:** Stroop Test, Coping Styles, Cognitive Styles, Interference

**Introduction**

Stroop Colour–Word task or Interference Test has been available as a screening instrument and is also part of a large battery of neurological and psychological tests for selective attention and cognitive flexibility [1-2]. Past literatures have been associating Stroop interference with other preceding precursor processes or secondary external stimuli on coping formation such as anxiety, stress and temperament [3-5]. Previous findings found people with repressive coping style can inhibit automaticity in Stroop Test

indicating that repressors selectively avoid attending to threat-related stimuli [6]. Also, avoidance coping was associated with disproportionately longer colour naming time for threat related words as compared with neutral words in Emotional Stroop test [7]. However these past investigations of coping influence on Stroop test have been indirect and inconclusive because of variability of multidimensional coping models and application of different Stroop test.

Recent findings that Stroop interference effect can be utilized as psychological or cognitive

stressors capable of inducing emotional responses and heightened physiological changes also inspired current research. Investigations on stressfulness of Stroop test were affirmative that this test alone without added external pressures is sufficient to elicit necessary stressor markers such as increase in heart rate level [3, 8]. Fundamentally, current study investigation is based on the assumptions that conflicts arose when naming incongruent colour of the words that builds up internalized stress which is resolved by the coping behaviours. Nevertheless, previous studies on dimensionality of coping styles on COPE Inventory found that emotion or problem-focused scales have repeatedly emerged on the similar factor [9]. Previous study also commented that when stressed, people are flexible to use both kinds of coping styles to cope with unresolved problem as suggested by the high degree of overlap between styles depending on their unique experiences [10].

Coping response during stressful situation can be either dispositional or situation-specific due to individual differences in people. The dispositional coping reflects individual characteristics or trait-like responses to stress whereas situational coping reflects responses to a specific [11 - 12]. Past literature also addressed the possibility of individuals portraying stable coping styles pertaining to personality when they encountered stressful situations [13]. Several literatures supported that coping strategies may remain relatively consistent across time in a given stress domain and do not approach coping context anew to address broad array of stressors [14,15]. For the present study, it is more appropriate to investigate inter-individual coping measure between dispositional coping styles and situational strategy use because all subjects would have to respond to the same stressful test and report cognitive performance in the same time frame. Consequently, the aim of current study is to investigate whether coping styles is associated with the outcome of cognitive performance, resistance to Stroop Interference (Stroop RI) as measured in Stroop test.

The concept of constricted versus flexible cognitive style seems to have instilled new

paradigm of how coping styles could relate to Stroop performance [16, 4]. Briefly, cognitive style is referred to individual's preference for information processing, regardless of individual differences in abilities, such as peak performance, or styles, which tend to describe an individual's characteristic mode of thinking, remembering or problem solving [18]. Application of flexible-constricted cognitive styles on Stroop Colour-word Test was first introduced by Smith & Klien [19] to measure subjects' behaviour in reaction to name colour of colour cards with mismatching colours. Subsequent past literatures replicates Smith & Klien's findings and pointed out that a person with a flexible cognitive style was relatively resistant to interference effects measured on the Stroop Test [16, 4]. We hypothesized that people who exhibit flexible cognitive style have high resistance to interference due to the ability to respond in a flexible manner without being overwhelmed by a dominant stimulus field. Vice versa, individuals with constricted cognitive style were prone to interference effects due to their limited capacity to attend to other information sources such as feelings or emotional reactions, whilst remaining focused on existing task. The resistance to change in cognitive sets indicates a constriction in ability to use all available cues. This hypothesis is supported by previous research findings that Stroop stimulus primarily concerned the difference in the individual's ability to sort information from the environment, and their selective response to it [20]. Based on the above assumptions, the second objective of this study is to investigate which coping styles predict cognitive styles as measured by resistance towards interference (RI) in Stroop Test, Stroop's RI.

## **Methods**

### ***Participants***

Undergraduate medical students (N= 203, 57 male, 146 female) ranging in age from 18 to 25 years (M= 21.48, SD= 1.97) from Universiti Sains Malaysia volunteered to participate in the present study. The study sample was relatively diverse, (53.7% Malay, 40.4% Chinese, 4.9% Indian and 1% others. Ethical approval was obtained from the Human Ethical Committee of Universiti Sains

Malaysia Health Campus (Ref: USMKK/PPP/JePeM 267.2[7]).

### **Assessments**

#### *Coping Styles*

Coping styles were measured by using the Malay version of Brief COPE inventory [21]. The internal consistency of this scale ranged from 0.58 to 0.83. This scale was translated from Carver et al. [22] to assess a broad range of coping responses among adults for all diseases in Malaysian population. It contains 28 items and is rated by the four-point likert scale, ranging from "I haven't been doing this at all" (score one) to "I have been doing this a lot" (score four). In this study, the higher the score of positive coping strategies (i.e. active coping, use of emotional support, use of instrumental support, venting, positive reframing, planning, humour, acceptance and religion) and the lower the score of negative or dysfunctional coping strategies (i.e. denial, substance use, behavioural disengagement and self-blame) indicate the greater use or better coping strategies. In total, 14 dimensions are covered by this scale. These are self-distraction, active coping, denial, substance use, use of emotional support, use of instrumental support, behavioural disengagement, venting, positive reframing, planning, humour, acceptance, religion and self-blame. Every dimension of the coping styles has two items and can be divided into three major categories: Problem-based Coping (i.e. active coping, planning, self-distraction and using instrumental support), Emotion-based Coping (i.e. positive reframing, acceptance, religion, using emotional support and denial) and Dysfunctional coping (i.e. focus on and venting of emotions, denial, behavioral disengagement, mental disengagement, and alcohol/drug use) [13].

#### *Cognitive styles*

The Stroop Colour-word test was utilized as a measure of flexible or constricted cognitive styles based on performance in resistance to interference (RI), known as Stroop's RI in regards to personality traits and coping styles. The reliability of Stroop scores is highly consistent across different versions of the test.

Golden [16] reported reliabilities of .89, .84 and .73 for group version of the test. The version of the Stroop Test employed here was the second Stroop version [17]. The tests comprised three pages. Each page had 100 items, presented in 5 columns of 20 items each. Page 1 (Word) consisted of the words "RED", "GREEN" and "BLUE", arranged randomly, and printed in black ink on white 8.5"x11" paper. Page 2 (Colour) consisted of 100 items, all written as "XXXX", printed in either red, green or blue ink. Page 3 (Colour-Word) consisted of the words on Page 1 printed in the colours on Page 2. The two pages were blended item for item: item 1 on page 1 was printed in the colour used in item 1 on page 2 to produce item 1 on page 3. Lower scores reflected greater constricted cognitive style and greater interference, while higher scores reflected flexible cognitive style and less interference.

After completion of Brief COPE (Malay Version) questionnaire, the Stroop Test was administered verbally to a group of 10 participants at a time, in a small, quiet room. The Stroop test is performed chronologically beginning with Word task, followed by Colour task, and finally Colour-Word task. In the Colour-Word task, the task required the participants to name the colours in which words were printed instead of reading words. All tasks were set to be done within 45 seconds. The number of correct items was recorded. The participants will be cued to amend their error during the task and the numbers of correct items were recorded. Prior to administering the Stroop Test, the examiner was unaware of the subjects' results on coping styles.

Statistical Package for the Social Sciences (SPSS, version 20) was employed for statistical analyses. Data screening was conducted to ensure that appropriate assumptions were met.

### **Results**

#### **3.1 Demographic data**

Data from an initial 205 participants who completed the study were screened and

corrected for missing values, resulting in a retained sample of 203 participants after data were excluded due to extreme outliers. None of the participants were reported of being colour-blind, dyslexic or diagnosed with

depression or other mental disorders. All variables were examined for fit between the distributions and assumptions for parametric tests. Table 1 shows the distribution of respondents according to demographics.

**Table 1. Demographics data**

Variables		Respondents, N = 230 ( %)
Gender, n (%)	Male	57 (28.1)
	Female	146 (71.9)
Race, n (%)	Malay	109 (53.7)
	Chinese	82 (40.4)
	Indian	10 (4.9)
	Others	2 (1)
Age, mean $\pm$ SD		21.48 $\pm$ 1.46

### **3.2 Associations between coping styles and Stroop's resistance towards interference (Stroop RI) scores**

A Pearson correlation coefficient test was conducted to investigate associations between the coping styles and Stroop RI. The correlation matrix for the subscales of the measures is presented in Table 2. The results showed that behavioural disengagement and self-blame are strongly negatively correlated to Stroop's interference whereas substance abuse only weakly negatively correlated to Stroop's interference (Table 2). All the other

coping styles have failed to prove any correlation with resistance for interference. Unlike past studies, current study also seek to determine the combined effect of coping styles of problem-based, emotional-based, and dysfunctional coping styles. As expected, the dysfunctional coping which represent combination of coping styles of self-blame, substance abuse, and behavioural disengagement, was strongly negatively correlated to the Stroop's RI score. However, the combined styles in dysfunctional coping has lesser correlation compared to single behavioural disengagement coping.

**Table 2. Correlation coefficient of coping styles with Stroop's RI<sup>^</sup> scores**

Correlations coefficient (r) (N=203)	Stroop's RI <sup>^</sup>	
	Pearson Correlation (r)	Sig. (2-tailed) p
Self-distraction	-0.0056	0.427
Active Coping	0.095	0.179
Instrumental Support	0.005	0.946
Planning	0.087	0.217
Acceptance	0.086	0.220
Denial	-0.120	0.089
Emotional Support	0.029	0.686
Positive Reframing	0.078	0.267
Humour	-0.019	0.792
Religion	-0.069	0.326
Substance Abuse	-0.173*	0.013
Behavioural Disengagement	-0.361**	< 0.001
Venting	-0.084	0.233
Self-blame	-0.222**	0.001
Problem-based	.067	0.340
Emotional-based	-.103	0.143
Dysfunctional	-.355**	< 0.001

<sup>^</sup>RI =resistance towards interference; \*p<0.05, \*\*P<0.01

**Linear relationships of coping styles and Stroop RI**

Regression analysis was performed for each of the COPE inventory outcome variables and two coping styles emerged as predictors for interference effect. Dysfunctional coping and behavioural disengagement coping were found

to be significant predictors of Stroop RI's performance [ $R^2=.154$ ,  $F(2,200) = 18.15$ ,  $p=0.001$ ]. The combined variance contributed 15.4% in the Stroop RI's score. Behavioural disengagement contributed the most variance ( $R^2=.13$ ) and dysfunctional coping only contributed 2.4% of the variance in interference effect (Table 3).

**Table 3. Multiple regression summary statistics for Brief COPE (N = 203)**

Coping Styles	Stroop RI (Resistance towards interference)				
	B	Beta	95% CI (lower, upper)	Partial r	p-value
Self-distraction	-.863	-.117	(-2.317, .592)	0.012	0.869
Active coping	-.463	-.057	(-2.091, 1.165)	0.092	0.196
Instrumental support	-.695	-.115	(-2.113, .723)	0.036	0.611
Planning	-.413	-.059	(-1.970, 1.144)	0.101	0.153
Acceptance	-.276	-.035	(-1.932, 1.380)	0.114	0.107
Denial	.477	.076	(-.793, 1.747)	-0.043	0.540
Emotional support	.677	.110	(.693, 2.047)	0.051	0.469
Positive reframing	.580	.083	(-.971, 2.131)	0.076	0.282
Humour	1.094	.170	(-.153, 2.341)	0.077	0.275
Religion	.058	.011	(-1.055, 1.171)	-.0056	0.428
Substance use	.062	.006	(-1.661, 1.784)	-0.016	0.821
Behavioural disengagement	-.509	-.077	(-1.926, .908)	-0.177	0.012
Venting	1.098	.180	(-.254, 2.450)	0.118	0.097
Self-blame	.541	.097	(-.684, 1.767)	0.002	0.980
Problem-based	.840	.362	(-.168, 1.849)	0.119	0.091
Emotional-based	-.719	-.346	(-1.602, .164)	-0.017	0.812
Dysfunctional	-1.275	-.482	(-2.271, -.278)	-0.164	0.020

Multiple Linear Regression (stepwise method). B= unstandardized coefficient, CI= confidence interval, Beta= standardized coefficient

**Discussion**

**Coping Styles and Stroop interference resistance**

Brief Cope is an abbreviated inventory that could be used to examine both coping dispositions and situation-specific coping tendencies with the assumption of individual difference in coping pertaining to personality that prompt people to cope in certain ways when they confront stressful events [13]. To note, previous study has not investigated coping styles in regard to cardinal cognitive

functions such as problem-solving, mental flexibility, decision making, or executive

functions under normal circumstances. Nevertheless, the concept of coping flexibility gave insight of incorporation of cognitive flexibility as individual's cognitive appraisal varies across situation, influencing choice of coping to attain effectiveness in goal achievement [23]. However, this concept focuses more on situation-strategic fit of coping matching the nature of a stressful situation which is different from current

study's objective to investigate dispositional coping influence on Stroop's performance.

Analysis of dimensions of fourteen coping style dimensions in Brief COPE showed strong negative correlation of behavioural disengagement, dysfunctional coping and self-blame with Stroop RI whereas substance use showed weak negative correlation. As expected, we found that only behavioural disengagement and dysfunctional coping negatively predicted Stroop RI of normal medical undergraduate students in this study. According to Carver [13], behavioural disengagement was described as reducing ones effort to deal with stressors or even giving up on attempts to attain goals when interference from perceived stressors exist. Medical students in this study were observed to skip or reduce attempts to continue on naming colours of all the items after making error as time urgency was imposed on Colour-Word task. Reductions in attempts or skipping items are obvious proof of students' tendency for behavioural disengagement coping. Inherently, reductions in attempts or skipping items caused substantial reduction in Stroop's RI performance. Thus, this implied that these students who prefer behavioural disengagement coping were noted to have constricted cognitive styles, whereby they were more prone to interference effects because of their limited capacity to take in and deal with stressors from the test.

Behavioural disengagement is also regarded as a type of avoidance coping [13]. Comparison of current study with previous study reported similarity that avoidance coping was associated with disproportionately longer colour naming time for threat related words as compared with neutral words in emotional Stroop test [7]. Though there are slight difference of assessment and scoring protocol,

poor Stroop interference resistance outcome was reported but in the form of longer colour naming time. This finding suggested that individuals with avoidance coping style may display increased attention towards threat word content or have difficulty in diverting attention away from such content when it is initially encountered, leading to longer naming of colours. Likewise, current study using the

Stroop test showed that the conflict from the interfering, fast and automatic colours naming pitting against slow, voluntary and controlled conscious, colour naming task [24 - 25] promote internalised stress through response processing competition [26]. In other words, both emotional Stroop and conventional Stroop test could detect poor interference resistance performance, to one extent highlighting due to the choice of avoidance coping.

In addition, self-blame has been found to be a predictor of poor adjustment under stress in other research using different coping measures [27]. Self-blame has also been identified in recent study as a significant predictor for associated factor of depression among medical and dental students of USM [28]. Findings from past literature concluded that depressed populations exhibit inconsistent depression-related Stroop effects, and strong memory biases depression is associated with biases in controlled or effortful processing in mental processes such as interpretation and memory instead of with automatic processes such as attention [29]. Qualitative reviews of Stroop performance validate the inconsistency of depression-related Stroop effects [30 - 32]. Therefore, self-blame is likely to explain the poor performance in Stroop's RI. Our study also found weak negative correlation of substance use with Stroop's RI. This may be due to prior screening whereas none of the students in our study are drinkers or drug abusers and secondly, because of lack of availability and access to drugs and alcohol in the community. Thus, it is natural to believe substance use is never a choice of coping for the respondents. Past analyses from simple linear regression on neurotic personality traits and depression among first year medical and dental students of USM further confirmed that substance use coping is not significant [28]. Nevertheless, substance use effect may be

substantial in other populations as it is among the ineffective coping styles which are characterized as neurotic coping [33].

However, surprisingly by categorizing self-blame, substance use, denial and behavioural disengagement coping under a generalised category of dysfunctional coping based on

Carver [13], our results showed dysfunctional coping negatively correlated with and predicted Stroop's RI. It is arguable about the predictive power of dysfunctional coping on interference resistance because it may be the dilution of predictive power of the single main predictor, behavioural disengagement coping. Statistical regression analysis showed that single behavioural disengagement coping contributed 13% of the variance in interference effect compared to 2.4% contributed by dysfunctional coping. Normally, combined factors should enhance the prediction for Stroop's RI, but since results showed otherwise, suggesting dysfunctional coping influence on Stroop interference resistance is minor.

One significant limitation of this study is that it is a cross-sectional study. In addition, since the respondents were given flexibility of using their native language in tasks, there might be confounding bias in the Stroop Colour-Word test because the items are printed in single language which is English. However, this would not affect the overall performance of Stroop Colour-Word test because most Malaysian undergraduates are bilinguals under the context that Malaysian is a multi-racial nation with bilingual educational system. Considering these limitations, caution must be taken in generalizing the results of the study.

### **Conclusion**

This study found that individual difference parameters could affect Stroop's interference resistance prediction. Negative predictions are portrayed by behavioural disengagement and dysfunctional coping styles with Stroop Colour-Word Test. Low performance in Colour-Word Test indicated that negative predictors are more prone towards restricted cognitive styles. Behavioural disengagement coping is the strongest predictor for Stroop RI while dysfunctional coping significantly

predicts Stroop RI among the medical students of USM. These findings have suggested that individual differences parameters such as coping styles, imperatively affect Stroop RI performance of normal individuals under normal circumstances. As such, coping styles should be considered to enable comparing

resistance towards Stroop interference performance with other respondent under normal circumstances. Coping styles have implication on Stroop test exhibited in varied cognitive styles. Integrating coping styles factor on Stroop test has glimpsed the future direction of other neuropsychological assessment batteries on the importance of profiling individualistic baseline norms.

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### **References**

1. Spreen O. A compendium of neuropsychological tests: Administration, norms, and commentary: Oxford University Press; 1998.
2. Moore A, Malinowski P. Meditation, mindfulness and cognitive flexibility. *Consciousness and cognition*. 2009;18(1):176-86.
2. Renaud P, Blondin J-P. The stress of Stroop performance: physiological and emotional responses to color-word interference, task pacing, and pacing speed. *International Journal of Psychophysiology*. 1997;27(2):87-97.
4. Alansari B. The relationship between anxiety and cognitive style measured on the Stroop Test. *Social Behavior and Personality: an international journal*. 2004;32(3):283-93.
5. Rothbart MK, Hwang J. Temperament and the development of competence and motivation. *Handbook of competence and motivation*. 2005:167-84.
6. Newman LS, McKinney LC. Repressive coping and threat-avoidance: An idiographic Stroop study. *Personality and Social Psychology Bulletin*. 2002;28(3):409-22.

7. Avero P, Corace KM, Endler NS, Calvo MG. Coping styles and threat processing. *Personality and individual differences*. 2003;35(4):843-61.
8. Silva FT, Leite JR. Physiological modifications and increase in state anxiety in volunteers submitted to the Stroop Color–Word Interference Test: A preliminary study. *Physiology & behavior*. 2000;70(1):113-8.
9. Litman JA. The COPE inventory: Dimensionality and relationships with approach-and avoidance-motives and positive and negative traits. *Personality and individual differences*. 2006;41(2):273-84.
10. Tennen H, Affleck G, Armeli S, Carney MA. A daily process approach to coping: Linking theory, research, and practice. *American Psychologist*. 2000;55(6):626.
11. Moos RH, Holahan CJ. Dispositional and contextual perspectives on coping: Toward an integrative framework. *Journal of clinical psychology*. 2003;59(12):1387-403.
12. Bouchard G, Guillemette A, Landry-Léger N. Situational and dispositional coping: An examination of their relation to personality, cognitive appraisals, and psychological distress. *European Journal of Personality*. 2004;18(3):221-38.
13. Carver CS, Scheier MF, Weintraub JK. Assessing coping strategies: a theoretically based approach. *Journal of Personality and Social Psychology*. 1989;56(2):267.
14. Gil KM, Wilson JJ, Edens JL. The stability of pain coping strategies in young children, adolescents, and adults with sickle cell disease over an 18-month period. *The Clinical journal of pain*. 1997;13(2):110-5.
15. Powers DV, Gallagher-Thompson D, Kraemer HC. Coping and Depression in Alzheimer's Caregivers Longitudinal Evidence of Stability. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*. 2002;57(3):P205-P11.
16. Golden CJ, Golden EE. Resistance to cognitive interference as a function of MMPI profile. *Journal of Consulting and Clinical Psychology*. 1975;43(5):749.
17. Golden C. A manual for the Stroop Color and Word Test. Chicago: Stoelting Co. 1978.
18. Gardner RW. Cognitive Styles in Categorizing Behavior1. *Journal of Personality*. 1953;22(2):214-33.
19. Smith GJ, Klein GS. Cognitive Controls in Serial Behavior Patterns1. *Journal of Personality*. 1953;22(2):188-213.
20. Klein GS. Semantic power measured through the interference of words with color-naming. *The American journal of psychology*. 1964.
21. Yusoff MSB. The Validity of the Malay Brief COPE in Identifying Coping Strategies among Adolescents in Secondary School. *Int Med J*. 2011.
22. Carver CS. You want to measure coping but your protocol'too long: Consider the brief cope. *International journal of behavioral medicine*. 1997;4(1):92-100.
23. Cheng C. Assessing coping flexibility in real-life and laboratory settings: a multimethod approach. *Journal of Personality and Social Psychology*. 2001;80(5):814.
24. Posner MI, Snyder C, editors. R.(1975).“Attention and cognitive control,”. *Information processing and cognition: The Loyola symposium*.



25. Shiffrin RM, Schneider W. Controlled and automatic human information processing: II. Perceptual learning, automatic attending and a general theory. *Psychological review*. 1977;84(2):127.
26. Doehrman S, Landau R, O'CONNELL D. The Stroop phenomenon: Perceptual conflict or response competition? *Perceptual and Motor Skills*. 1978;47(3f):1127-31.
27. Bolger N. Coping as a personality process: a prospective study. *Journal of Personality and Social Psychology*. 1990;59(3):525.
28. Othman Z, YS LK, MAM Y. Neurotic Personality Traits and Depression among First Year Medical and Dental Students in Universiti Sains Malaysia. *Malaysian Journal of Psychiatry*. 2013;22(1).
29. Williams JMG, Mathews A, MacLeod C. The emotional Stroop task and psychopathology. *Psychological Bulletin*. 1996;120(1):3.
30. Gotlib IH, Roberts JE, Gilboa E. Cognitive interference in depression. *Cognitive interference: Theories, methods, and findings*. 1996:347-77.
31. Mogg K, Bradley BP. Attentional bias in generalized anxiety disorder versus depressive disorder. *Cognitive therapy and research*. 2005;29(1):29-45.
32. Epp AM, Dobson KS, Dozois DJA, Frewen PA. A systematic meta-analysis of the Stroop task in depression. *Clinical Psychology Review*. 2012;32(4):316-28. doi: <http://dx.doi.org/10.1016/j.cpr.2012.02.005>.
33. McCrae RR, Costa PT. Personality, coping, and coping effectiveness in an adult sample. *Journal of Personality*. 1986;54(2):385-404.

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