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Do the male with type D personality have more mental symptoms? Evidence from coping tendency of Chinese college students

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ABSTRACT

The objective of the current study was to explore the possible mechanism in a non-clinical population. A self-reported survey was conducted among 2016 Chinese college students through questionnaires assessing Type D, coping tendency and mental symptoms. As a normal personality subtype, the incidence of Type D in the sample is higher. Compared with the scores of type D^- group, the type D^+ group's score of positive coping tendency was lower and that of mental symptoms was higher. Type D can exert an effect on mental health directly, and indirectly through coping tendency. Moreover, there was a gender difference in the mediating path. The mediation effect of coping tendency is more prominent in men, and the male have more mental symptoms than the female while they have the same Type D score.

1. Introduction

Type D personality is known as *distressed personality*, which is regarded as a subtype of normal personality (Denollet et al., 1996). In the general population, the proportion of individuals with Type D ranged from 16.6% to 38.8% (Mols & Denollet, 2010). Type D was a significant predictor of negative mental health conditions, such as PTSD symptoms (Habibović, Denollet, & Pedersen, 2017), burnout (Tekin, Karadag, & Yayla, 2017), anxiety and depression (Mujezinovic et al., 2018), leading to higher possibilities for mental health services (Michal, Wiltink, Grande, Beutel, & Brahler, 2011). Accordingly, research on Type D has gradually switched to the non-clinical population, from the patients with coronary heart disease or other physical diseases.

1.1. Type D and mental health: the mediation role of coping tendency

According to the transactional model of stress, there is a two-stage cognitive-appraisal process when individuals are faced with stressors, and stress is the result of interaction between individuals and the environment. Coping is a resource to change the situation in the second stage. In the face of stressors, individual differences will affect individuals' choice of coping response, and then affect the negative effects of stressors (Lazarus & Folkman, 1987; Nandkeolyar, Shaffer, Li, Ekkirala, & Bagger, 2014). Actually, coping is a mediator worthy of attention in the relationship between Type D and mental health (Carver & Connor-Smith, 2010).

There are lots of different ways to classify coping, and researchers have been trying to differentiate and analyze the mediating role of various coping strategies. For example, Polman, Borkoles, and Nicholls (2010) revealed that resignation and withdrawal coping, which was one of three coping forms based on the Brief Approach/Avoidance Coping Questionnaire by Finset, Steine, Haugli, Steen, and Laerum (2002), partially mediated the link between type D and perceived stress. Williams and Wingate (2012) obtained a similar model, but the mediating variables were social support and emotion-focused coping. Anyway, based on different measurement instruments, researchers confirmed the mediating role of various coping strategies between Type D and mental health (X. Yu, Chen, Zhang, & Liu, 2011; Booth & Williams, 2015). Various mediation models illustrate the mediation role of coping, but it seems difficult to clearly and concisely describe the role. Moreover,

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coping strategies may change with the situation and the time. Is there a relatively direct and stable variable to describe individual coping characteristics so as to provide a further understanding of the role of coping between Type D and mental health? Coping tendency is a possible choice.

Lazarus (1993) defined coping as what a person is thinking and doing in the effort to cope with stressful encounters. *Fight or Flight* are two basic reactions to stress. *Approach-oriented coping and avoidance-oriented coping*, which have been described as "cognitive and emotional activity that is oriented either toward or away from threat" respectively, are two basic orientations toward stressful information, or two basic modes of coping with stress (Roth & Cohen, 1986). Coping tendency, which is based on approach-oriented and avoidance-oriented coping (see Dai, 2010), refers to the tendency of individuals to *Fight* or *Flight* in the face of stress. The basic tendency reaction of an individual facing stress is *Fight* if the person is classified as positive coping tendency, otherwise it is *Flight*. Coping tendency is concise and clear, however, there are few studies examining the variable in the mechanism of Type D on individual mental health.

Personality reflects the stability and integration of individual psychology and behaviors, affecting the person's dispositional coping. Bolger (1990) even refer to coping as *personality in action under stress*. People with Type D were more likely to adopt negative coping tendency such as avoidance coping strategies, and less used positive coping tendency (Blachnio, Przepiorka, & Czuczwar, 2017; Strober, 2017; Yamaguchi, Izawa, & Matsunaga, 2020).

The coping tendency a person habitually employs, to some extent, depends on the perceived efficacy of various coping styles (Borkoles et al., 2018), thus removing unconscious defensive reactions from the realm of consideration (Cramer, 2003). Consequently, in the short term, both positive and negative coping tendency may be adaptive. However, in the long term, at least from the perspective of health, the relationship between coping and health is clear and consistent: positive coping tendency is usually linked to positive psychological health, while negative coping tendency to negative psychological outcomes (Compas et al., 2017; Penley, Tomaka, & Wiebe, 2002).

To sum up, coping tendency is a possible entrance to pithily assess how personality predicts psychological outcomes. Individuals with Type D are more likely to adopt negative coping tendency, which may dispose them haunted by worse mental health. Therefore, the current study put forward hypothesis 1: Coping tendency is a mediator in the influence of Type D on mental health.

1.2. The moderation role of gender

Gender differences were confirmed in the relationship between personality variables and mental health (Schutter et al., 2020; W.J. Xie & Karan, 2019), which is closely related to the culture. According to the social identity theory (Tajfel & Turner, 1979), individuals classify themselves into a certain group based on gender and identity, and then identify with the norms of the group and adopt the behavior mode consistent with the norms. "Breadwinning men and homemaking women" has always been a typical traditional Chinese conception. Chinese culture emphasizes different values between men and women, and people internalize the norms accordingly, which makes gender an important factor affecting the relationship between Type D and mental health.

For one thing, the influence of Type D on mental health could be different. The interpretation of the same characteristic varies with different gender in China. As far as women are concerned, distress and distance from society are more or less in line with the expectation of Chinese traditional culture, and thus Type D is relatively hidden and safe among women. Conversely, if a man is distressed and distanced from society, it will be harder for him to be accepted by the mainstream. In the light of identity construction hypothesis, stereotypes and individual self-perceptions interactively influence gender identity, and even elementary-school-aged children could evaluate themselves based on their understanding of cultural gender roles (Patterson, 2012). Men may feel more dissatisfied, ashamed and upset than women because of their negative affectivity and social inhibition. Therefore, the current study put forward hypothesis 2: There is a gender difference in the direct effect of Type D to mental health, and the effect in women is less than that in men.

For another thing, the mediation role of coping tendency is different for men and women. Compared to men, Chinese women are more relationship-oriented and have higher perceived social support (S. Zhang, Zhang, & Li, 2015), which is a predictor of positive coping (Luo, Zhang, & Liu, 2020). A study on Chinese migrant workers showed that adopting more strategies like confiding and seeking social support helped females adapt to urban life better than males, although women were under more psychological pressures than men (Hu, Cao, & Lv, 2011). Lange, Karpinski, Krohn-Grimberghe, and Pertermann (2010) got a similar finding. Generally, women adopt more adaptive coping strategies than men (Cerea, Bottesi, Grisham, Vieno, & Ghisi, 2017; Ellis & Lamis, 2007). Instead, negative coping, such as smoking and drinking, are more common among men (Lv et al., 2020), which may make it difficult to obtain effective social support, and produce extra stress. Besides, in China, female students are more proactive than the male, such as less homework procrastination (Pang & Han, 2009), more social practice (J. Wang & Guo, 2015), and more growth-oriented attribution (X. Zhang, 2006). Therefore, the current study put forward hypothesis 3: There is a gender difference in the effect of Type D on coping tendency, and the effect in women is lower than that in men.

To sum up, the research reported here hypothesized that Type D can exert an effect on mental health through coping tendency, and there is a gender difference in the path (Fig. 1).

2. Methods

2.1. Sample and procedure

Ethical approval was granted by the institutional ethics committee of [masked for review] University. All procedures performed were in accordance with the 1964 Helsinki Declaration and its later amendments.

A pen-and-paper survey was conducted in a university in eastern China, with stratified cluster sampling by grade and major, and selecting the class according to the random number table. A total of 49 classes were selected. Based on the principle of voluntariness, 2400 questionnaires were distributed and 2218 were collected (response rate = 92.4%).

Unfinished questionnaires were excluded, and therefore 2016 respondents (effective rate = 90.9%, $M_{age} = 19.56 \pm 1.25$ years, 71.2% female, 43.5% from urban area, 35.5% grade 1, 33.2% grade 2 and 31.3% grade 3) providing complete data were entered into the final analysis.

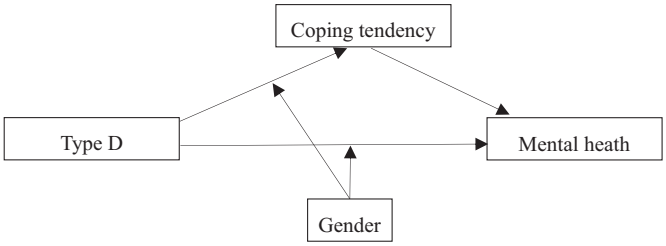

Fig. 1. The hypothesized research model.

2.2. Measurement

2.2.1. Type D personality

Type D personality was assessed by the Type D Personality Scale (DS14), which was proposed by Denollet (2005) and then modified as the DS14-Chinese Version (DS14-CV) by X. Yu and Zhang (2006). The DS14–CV contains two factors: Negative Affectivity (NA) and Social Inhibition (SI), including 14 items. Participants responded using a 5-point Likert scale anchored at 0 (false) to 4 (true). The higher the score, the more serious the negative affectivity and social inhibition. In the current study, the construct validity of the measurement was acceptable (*RMSEA* = 0.07, *SRMR* = 0. 06, *CFI* = 0. 93, *TLI* = 0.90), and the *Cronbach's α* of NA and SI were 0.84 and 0.80 respectively.

2.2.2. Mental health

Mental health was assessed by the Symptom Check List-90-Revised (SCL-90-R). The Chinese version by Z. Wang (1984) was used in the current study. Participants respond using a 5-point Likert scale anchored at 1 (not at all) to 5 (extremely). The higher the score, the worse the mental health. The construct validity indexes were as follows: *RMSEA* = 0.03, *SRMR* = 0. 04, *CFI* = 0. 84, *TLI* = 0.84. *Cronbach's α* of each subscale in the current study ranged from 0.68 to 0.86.

2.2.3. Coping tendency

Coping tendency was assessed by Simplified Coping Style Questionnaire (SCSQ, Y. Xie, 1998). The scale contains two subscales: approach-oriented coping and avoidance-oriented coping. Individuals report their coping strategies on a 4-point Likert scale which ranges from 0 (I don't do this at all) to 3 (I do this a lot). Coping tendency was the *Z*-score of approach-oriented coping minus that of avoidance-oriented coping. It can be inferred that the higher the score of coping tendency is, the more positive coping strategies the individual adopts. SCSQ is one of the most commonly used scales in coping research in China, and it has been widely used among Chinese college students. The construct validity of the measurement was acceptable (*RMSEA* = 0.04, *SRMR* = 0. 05, *CFI* = 0. 92, *TLI* = 0.90). *Cronbach's α* of each subscale were 0.81 and 0.72 respectively.

2.3. Statistical analysis

The common method bias was examined with Harman single factor method. Demographic characteristics of participants and basic statistical results were analyzed with descriptive statistics. Study variables of Type D^+ group and Type D^- groups were compared with independent-samples *t*-test. The relationship among study variables was analyzed with Pearson correlation test. The above statistical analyses were conducted in SPSS Version 19.0 (IBM, Chicago, USA).

The hypothesized model (Fig. 1) was examined through structural equation model, based on maximum likelihood. The bias-corrected 95% confidence interval (CI) was calculated with 1000 bootstrapping resamples. Mplus version7.4 (Muthén & Muthén, 1998-2012) was used to fit the hypothesized model.

3. Results

3.1. Common method bias

The results showed that the characteristic root of 27 factors was greater than 1, and the variance explained by the first factor was 20.4%, less than the critical value of 40%. Therefore, it can be inferred that there was no serious common method bias in the data of the current study.

3.2. Descriptive statistics

Of the 2016 participants, 670 participants (33.23%) were classified as Type D. Descriptive statistics of Type D group and non-Type D group are presented in Table 1, along with corresponding independent-samples *t*-test results. There were differences between the two groups in all comparison items. The scores of approach-oriented coping and coping tendency of Type D group were lower, while the scores of avoidance-oriented coping and SCL-90-R (the total score and each factor score) were higher.

3.3. Correlations

Pearson product-moment correlation analysis was carried out on the study variables. The results (Table 2) showed that there was a medium, positive correlation between two variables ($r = 0.50$, $p<0.001$), higher levels of Type D associated with higher scores on mental symptoms. Additionally, Type D was negatively correlated with coping tendency ($r = -0.46$, $p<0.001$), showing that higher Type D scores were associated with lower positive coping. Furthermore, coping tendency had a small, negative correlation with higher level of mental health scores ($r = -0.34$, $p<0.001$).

3.4. Type D and mental health: a moderated mediating model

Gender and Type D were centralized, and multiplicative interaction was constructed. The hypothesized model fit moderately well: $\chi^2 = 333.276$, $df = 63$, *RMSEA* = 0.046(90%CI: 0.041–0.051), *CFI* = 0.984, *TLI* = 0.978, *SRMR* = 0.020. However, not all of the predicted paths were statistically significant: (1) gender did not show direct effect on mental symptoms ($\beta = 0.000$, $P = 0.989$); (2) the path coefficient of gender*Type D on mental symptoms was marginally significant($\beta = -0.043$, $P = 0.026$), and the 95% *CI*(−0.092, 0.003) covered 0.

After deleting the path, the model is tested again, and the model is used as an alternative model of the hypothesized model. The alternative model fit moderately well: $\chi^2 = 338.200$, $df = 65$, *RMSEA* = 0.046(90% CI: 0.041–0.051), *CFI* = 0.984, *TLI* = 0.978, *SRMR* = 0.022. The model explained 29.1% of the variance of mental health. The standardized path coefficients of the model are shown in Fig. 2.

The results show that the 95% confidence interval of each standardized path coefficient does not cover 0 (Table 3). The mediating effect of coping tendency was 0.071 (95% CI (0.051, 0.090)), accounting for 13.6% of the total effect.

Furthermore, a simple slope test was conducted to analyze the moderation role of gender. The regression coefficient of Type D to coping tendency in female (simple slope = −0.54, $t = -17.03$, $p<0.001$;

Table 1
Group comparisons on coping and mental symptoms.

	Type D+ M ± SD (n = 670)	Type D- M ± SD(n = 1346)	t	p
Approach-oriented coping	22.30 ± 5.72	25.64 ± 5.17	−12.74	0.000
Avoidance-oriented coping	10.90 ± 3.93	9.21 ± 4.03	8.98	0.000
Coping tendency	−0.73 ± 1.22	0.28 ± 1.22	−17.54	0.000
Total score of SCL-90-R	142.86 ± 34.01	117.36 ± 24.35	17.32	0.000
Somatization	1.35 ± 0.37	1.17 ± 0.27	11.12	0.000
Obsession-compulsion	1.95 ± 0.57	1.63 ± 0.49	12.59	0.000
Interpersonal sensitivity	1.85 ± 0.55	1.45 ± 0.43	16.21	0.000
Depression	1.62 ± 0.50	1.24 ± 0.30	17.98	0.000
Anxiety	1.58 ± 0.46	1.27 ± 0.31	15.53	0.000
Hostility	1.52 ± 0.48	1.23 ± 0.33	14.38	0.000
Phobic anxiety	1.44 ± 0.45	1.22 ± 0.34	11.17	0.000
Paranoid ideation	1.54 ± 0.45	1.28 ± 0.34	13.64	0.000
Psychoticism	1.47 ± 0.39	1.25 ± 0.28	13.47	0.000
Disturbances in appetite and sleep	1.48 ± 0.44	1.27 ± 0.33	10.83	0.000

Table 2
Bivariate correlations among study variables.

Variable	$M \pm SD$	1	2	3	4	5	6
1. Type D personality	19.74 ± 7.89	1					
2. Negative affectivity	8.98 ± 4.61	0.86***	1				
3. Social inhibition	10.75 ± 4.55	0.86***	0.48***	1			
4. Approach-oriented coping	24.53 ± 5.58	−0.38***	−0.31***	−0.35***	1		
5. Avoidance-oriented coping	9.77 ± 4.08	0.22***	0.24***	0.14***	0.14***	1	
6. Coping tendency	—[a]	−0.46***	−0.42***	−0.37***	0.66***	0.65***	1
7. Mental symptoms	125.84 ± 30.40	0.50***	0.48***	0.38***	−0.24***	0.21***	−0.34***

Note. $n = 2016$.
[a] The mean and standard deviation of coping tendency are not calculated since it is the difference value of two *Z*-scores.
*** $p<0.001$.

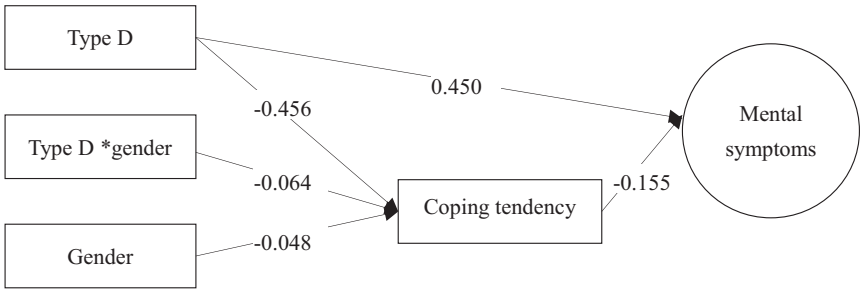

Fig. 2. The influential mechanism of type D personality on mental health.

Table 3
Confidence Interval of each path coefficient of the model.

Path	β	95%CI
Type D → mental symptoms	0.450	(0.409, 0.488)
Type D → coping tendency	−0.456	(−0.490, −0.421)
coping tendency → mental symptoms	−0.155	(−0.195, −0.113)
gender → coping tendency	−0.048	(−0.086, −0.000)
gender* Type D → coping tendency	−0.064	(−0.104, −0.021)

0.95CI:(−0.60,-0.48)) was lower than that in male (simple slope = −0.71, $t = -15.72$, $p<0.001$; 0.95CI:(−0.80,-0.62))(Fig. 3).

The mediating effect sizes in different gender groups were as follows: the effect size in female was 0.06 (0.95CI: (0.04, 0.08)), accounting for 12.00% of the total effect; the effect size in male was 0.08 (0.95CI: (0.06, 0.11)), accounting for 17.86% of the total effect. The mediation impact of coping tendency on mental symptoms was stronger for male as compared to female.

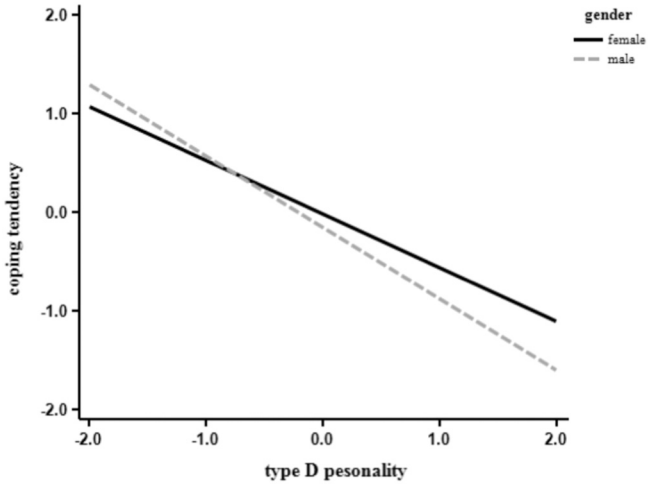

Fig. 3. The moderation role of gender on the relationship between Type D and coping tendency.

4. Discussion

4.1. The mediation role of coping tendency

The current study introduced coping tendency to explain how Type D affected individual psychological consequences, and confirmed the role of coping in the transactional model of stress. In the first stage, individuals with Type D often experience more feelings of subjective stress (William, O'Carroll, & O'Connor, 2009); in the second stage, they usually tend to use negative coping (Borkoles et al., 2018), which alters individual appraisal in the stage. The combination of these two stages lead to more stress and worse psychological consequences.

Specifically, people are inclined to deal with stress in some way consistent with their own personality traits. People with Type D usually experience a higher level of social alienation, accompanied by lower utilization of social support, higher avoidance, less confrontation and more acceptance-resignation coping (X. Yu et al., 2011), and thus they tend to flight from the stressful situation. Moreover, young adults have not yet formed more flexible and effective coping strategies, so they are more likely to be affected by temperament when dealing with stress. Therefore, the relationship between personality and coping is closer in young adults (Connor-Smith & Flachsbart, 2007). Meanwhile, coping is an influential factor of individual mental health. Fight tendency urges individuals to acquire more resources; conversely, flight tendency make individuals more passive, which was associated with lower well-being and distress (Meng & D'Arcy, 2016), particularly when it is adopted for a long period of time (Dindo & Lackner, 2017).

4.2. The gender difference of the mediation effect of coping tendency

The current study did not find the gender difference of Type D on mental health. The possible reason is that contemporary Chinese female undergraduates have long been divorced from the traditional shackles that "women are inferior to men". Most female participants were born after the year 2000, who had been receiving modern education advocating independence and equality between men and women in their

families and schools. For them, the link between negative affectivity, social inhibition and cultural expectations has been greatly weakened. Therefore, the so-called compensation effect according with cultural expectations has disappeared, and the negative impact of Type D on their mental health is consistent with that of male students. This is in line with the logic of the differential vulnerability difference hypothesis (McDonough & Walters, 2001): when the social roles and coping resources of the two genders tend to be similar, their psychological anomie will also converge. However, the traditional gender role definition cannot be easily changed due to the cultural accumulation for thousands of years. It is conceivable that the results might be different if the study was conducted in groups with more significant gender differences, rather than undergraduate students.

The current study revealed that the coping tendency of women with Type D was more positive than that of the males, which verified our hypothesis. There is a traditional preference for boys over girls in Chinese context, and women have been in a relatively passive and subordinate position for a long time. As a result, women have been working hard and fighting against unfriendly environment with more tenacious perseverance for better achievements.

4.3. Enlightenments and limitations

The current study provides an elaborated view of how personalities influence mental health, which providing ideas for the intervention of college students' mental health. Firstly, Type D can be used as a screening factor for mental health risks of the general population since Type D personality questionnaire is short and convenient to use. Secondly, guiding people to develop positive coping tendency is a potential path to control negative effects of Type D, especially in the male. Public awareness of coping should be enhanced. Specifically speaking, on the one hand, individuals can be guided to stay alert through knowing the harm and early performance of passive coping; on the other hand, they can be guided to consciously use positive coping strategies to replace their habitual passive ones through learning the benefits and avaliability of the former.

While the current study is likely to make a substantial contribution to the stress-health related filed, there are certain limitations. Firstly, the current study is cross-sectional and one-time retrospective. The longitudinal design is needed to test the possibility of causality among these variables. Future research could consider collecting dynamic data through mobile APPs based on time series, so as to reveal the long-term impact of Type D on mental health. Secondly, the dependent variable in the current study is mental health, which is defined as psychological symptoms operationally. Actually, according to the two-factor model of mental health, future research could combine the negative and positive psychological indicators to reflect the influence of Type D more comprehensively. Thirdly, the control of confounding variables should be further strengthened. For example, family socio-economic status and individual identification of gender roles in Chinese culture, which are two variables worthy of attention, could be introduced in the future to expand the depth of research on the relationship between Type D and mental health. Fourthly, the study was based on Chinese college students, so whether the moderated mediation model can be generalized to a wider population needs to be explored based on a more diversified sampling study.

5. Conclusions

Coping tendency may partly explain the relationship between Type D and mental health, and its mediation impact was stronger in males as compared to females.

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CRediT authorship contribution statement

Shengnan Wang: Formal analysis, Writing – original draft, Writing – review & editing. **Licai Zhao:** Investigation. **Xuji Jia:** Methodology, Writing – review & editing. **Xunbao Yin:** Investigation. **Xia Tan:** Investigation. **Juncheng Lyu:** Methodology. **Hongwei Sun:** Conceptualization, Investigation, Supervision.

Declaration of competing interest

None.

References

Blachnio, A., Przepiorka, A., & Czuczwar, S. J. (2017). Type D personality, stress coping strategies and self-efficacy as predictors of Facebook intrusion. *Psychiatry Research, 253*, 33–37. https://doi.org/10.1016/j.psychres.2017.03.022.

Booth, L., & Williams, L. (2015). Type D personality and dietary intake: The mediating effects of coping style. *Journal of Health Psychology, 20*(6), 921–927. https://doi.org/10.1177/1359105315573433.

Bolger, N. (1990). Coping as a personality process: A prospective study. *Journal of Personality and Social Psychology, 59*(3), 525–537. https://doi.org/10.1037/0022-3514.59.3.525.

Borkoles, E., Kaiseler, M., Evans, A., Ski, C. F., Thompson, D. R., & Polman, R. C. J. (2018). Type D personality, stress, coping and performance on a novel sport task. *PLoS One, 13*(4). https://doi.org/10.1371/journal.pone.0196692.

Carver, C. S., & Connor-Smith, J. (2010). Personality and coping. *Annual Review of Psychology, 61*, 679–704. https://doi.org/10.1146/annurev.psych.093008.100352.

Cerea, S., Bottesi, G., Grisham, J. R., Vieno, A., & Ghisi, M. (2017). Dispositional and situational coping among individuals with alcohol use disorder. *Journal of Substance Abuse Treatment, 80*, 79–87. https://doi.org/10.1016/j.jsat.2017.07.004.

Compas, B. E., Jaser, S. S., Bettis, A. H., Watson, K. H., Gruhn, M. A., Dunbar, J. P., … Thigpen, J. C. (2017). Coping, emotion regulation, and psychopathology in childhood and adolescence: A meta-analysis and narrative review. *Psychological Bulletin, 143*(9), 939–991. https://doi.org/10.1037/bul0000110.

Connor-Smith, J. K., & Flachsbart, C. (2007). Relations between personality and coping: A meta-analysis. *Journal of Personality and Social Psychology, 93*(6), 1080–1107. https://doi.org/10.1037/0022-3514.93.6.1080.

Cramer, P. (2003). Personality change in later adulthood is predicted by defense mechanism use in early adulthood. *Journal of Research in Personality, 37*(1), 76–104. https://doi.org/10.1016/s0092-6566(02)00528-7.

Dai, X. (2010). *Handbook of commonly used psychological assessment scales*. Beijing: People's Millitary Medical Press.

Denollet, J., Sys, S. U., Stroobant, N., Rombouts, H., Gillebert, T. C., & Brutsaert, D. L. (1996). Personality as independent predictor of long-term mortality in patients with coronary heart disease. *The Lancet, 347*(2999), 417–421. https://doi.org/10.1016/S0140-6736(96)90007-0.

Denollet, J. (2005). DS14: Standard assessment of negative affectivity, social inhibition, and type D personality. *Psychosomatic Medicine, 67*(1), 89–97. https://doi.org/10.1097/01.psy.0000149256.81953.49.

Dindo, L., & Lackner, J. (2017). Effects of different coping strategies on physical and mental health of patients with irritable bowel syndrome. *Clinical Gastroenterology and Hepatology, 15*(10), 1500–1503. https://doi.org/10.1016/j.cgh.2017.03.041.

Ellis, J. B., & Lamis, D. A. (2007). Adaptive characteristics and suicidal behavior: A gender comparison of young adults. *Death Studies, 31*(9), 845–854. https://doi.org/10.1080/07481180701537303.

Finset, A., Steine, S., Haugli, L., Steen, E., & Laerum, E. (2002). The brief approach/avoidance coping questionnaire: Development and validation. *Psychology Health and Medicine, 7*(1), 75–85. https://doi.org/10.1080/13548500120101577.

Habibović, M., Denollet, J., & Pedersen, S. S. (2017). Posttraumatic stress and anxiety in patients with an implantable cardioverter defibrillator: Trajectories and vulnerability factors. *Pace-Pacing and Clinical Electrophysiology, 40*(7), 817–823. https://doi.org/10.1111/pace.13090.

Hu, H., Cao, Y., & Lv, W. (2011). Mental stress, city adaptation, confiding channels and sexual difference: The comparison of psychological problems of new generation migrant workers between male and female. *Youth Studies, 43*(3), 76–86,96.

Lange, M., Karpinski, N., Krohn-Grimberghe, B., & Pertermann, F. (2010). Patients with fibromyalgia: Gender differences. *Schmerz, 24*(3), 262–266. https://doi.org/10.1007/s00482-010-0924-0.

Lazarus, R. S., & Folkman, S. (1987). Transactional theory and research on emotions and coping. *European Journal of Personality, 1*(3), 141–169. https://doi.org/10.1002/per.2410010304.

Lazarus, R. S. (1993). Coping theory and research: Past, present, and future. *Psychosomatic Medicine, 55*(3), 234–247. https://doi.org/10.1097/00006842-199305000-00002.

Luo, R. Z., Zhang, S., & Liu, Y. H. (2020). Short report: Relationships among resilience, social support, coping style and posttraumatic growth in hematopoietic stem cell transplantation caregivers. *Psychology, Health & Medicine, 25*(4), 389–395. https://doi.org/10.1080/13548506.2019.1659985.

Lv, B.H., Deng, Q.L., Xia, J., Yan, R., Yang, R.R., Wu, P., & Yu, J.M. (2020). Study on smoking status among college students and their family members in Shanghai. Chinese Journal of Health Education, 36(9), 801-806. doi:10.16168/j.cnki.issn.1002-9982.2020.09.006.

McDonough, P., & Walters, V. (2001). Gender and health: Reassessing patterns and explanations. *Social Science and Medicine, 52*, 547–559. https://doi.org/10.1016/S0277-9536(00)00159-3.

Meng, X., & D'Arcy, C. (2016). Coping strategies and distress reduction in psychological well-being? A structural equation modelling analysis using a national population sample. *Epidemiology and Psychiatric Sciences, 25*(4), 370–383. https://doi.org/10.1017/s2045796015000505.

Michal, M., Wiltink, J., Grande, G., Beutel, M. E., & Brahler, E. (2011). Type D personality is independently associated with major psychosocial stressors and increased health care utilization in the general population. *Journal of Affective Disorders, 134*(1–3), 396–403. https://doi.org/10.1016/j.jad.2011.05.033.

Mols, F., & Denollet, J. (2010). Type D personality in the general population: A systematic review of health status, mechanisms of disease, and work-related problems. *Health and Quality of Life Outcomes, 8*(1), 9. https://doi.org/10.1186/1477-7525-8-9.

Mujezinovic, A., Kwiet, J., Kornhaber, R., Holt, R., Streimer, J., Vandervord, J., … McLean, L. (2018). Type-D personality and elevated psychological symptoms in early adjustment of severe burn injury patients. *Issues in Mental Health Nursing, 39*(4), 337–343. https://doi.org/10.1080/01612840.2017.1416506.

Muthén, L., & Muthén, B. (1998–2012). *Mplus user's guide* (7th ed.). Los Angeles, CA: Muthén & Muthén.

Nandkeolyar, A. K., Shaffer, J. A., Li, A., Ekkirala, S., & Bagger, J. (2014). Surviving an abusive supervisor: The joint roles of conscientiousness and coping strategies. *Journal of Applied Psychology, 99*(1), 138–150. https://doi.org/10.1037/a0034262.

Pang, W., & Han, G. (2009). Study on the popularity and causes of academic procrastination of Chinese undergraduates. *Tsinghua Journal of Education, 30*(6), 59–65,94.

Patterson, M. M. (2012). Self-perceived gender typicality, gender-typed attributes, and gender stereotype endorsement in elementary-school-aged children. *Sex Roles, 67*(7–8), 422–434. https://doi.org/10.1007/s11199-012-0184-9.

Penley, J. A., Tomaka, J., & Wiebe, J. S. (2002). The Association of Coping to physical and psychological health outcomes: A meta-analytic review. *Journal of Behavioral Medicine, 25*(6), 551–603. https://doi.org/10.1023/A:1020641400589.

Polman, R., Borkoles, E., & Nicholls, A. R. (2010). Type D personality, stress, and symptoms of burnout: The influence of avoidance coping and social support. *British Journal of Health Psychology, 15*(3), 681–696. https://doi.org/10.1348/135910709X479069.

Roth, S., & Cohen, L. J. (1986). Approach, avoidance, and coping with stress. *American Psychologist, 41*(7), 813–819. https://doi.org/10.1037/0003-066x.41.7.813.

Schutter, N., Koorevaar, L., Holwerda, T. J., Stek, M. L., Dekker, J., & Comijs, H. C. (2020). 'Big Five' personality characteristics are associated with loneliness but not with social network size in older adults, irrespective of depression. *International Psychogeriatrics, 32*(1), 53–63. https://doi.org/10.1017/s1041610219000231.

Strober, L. B. (2017). Personality in multiple sclerosis (MS): Impact on health, psychological well-being, coping, and overall quality of life. *Psychology, Health & Medicine, 22*(2), 152–161. https://doi.org/10.1080/13548506.2016.1164321.

Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. *The Social Psychology of Intergroup Relations, 33*(47), 94–109.

Tekin, A., Karadag, H., & Yayla, S. (2017). The relationship between burnout symptoms and type D personality among health care professionals in Turkey. *Archives of Environmental & Occupational Health, 72*(3), 173–177. https://doi.org/10.1080/19338244.2016.1179168.

Wang, J., & Guo, M. (2015). Gender differences in college student employment between Taiwan and the mainland——Based on the survey of seven "211" universities in Wuhan and ten universities in Taiwan. *Education & Economy, 6*, 41–46.

Wang, Z. (1984). Symtom check list(SCL-90). *Shanghai Psychiatry, 2*(2), 68–70.

William, L., O'Carroll, R. E., & O'Connor, R. C. (2009). Type D personality and cardiac output in response to stress. *Psychology and Health, 24*(5), 489–500. https://doi.org/10.1080/08870440701885616.

Williams, L., & Wingate, A.(2012). Type D personality, physical symptoms and subjective stress: The mediating effects of coping and social support. *Psychology and Health*, 27(9), 1075-1085. doi:https://doi.org/10.1080/08870446.2012.667098.

Xie, W. J., & Karan, K. (2019). Predicting Facebook addiction and state anxiety without Facebook by gender, trait anxiety, Facebook intensity, and different Facebook activities. *Journal of Behavioral Addictions, 8*(1), 79–87. https://doi.org/10.1556/2006.8.2019.09.

Xie, Y. (1998). A preliminary study on the reliability and validity of mini coping style scale. *Chinese Journal of Clinical Psychology, 6*(2), 114–115.

Yamaguchi, D., Izawa, A., & Matsunaga, Y. (2020). The association of depression with type D personality and coping strategies in patients with coronary artery disease. *Internal Medicine, 59*(13), 1589–1595. https://doi.org/10.2169/internalmedicine.3803-19.

Yu, X., Chen, Z., Zhang, J., & Liu, X. (2011). Coping mediates the association between type D personality and perceived health in Chinese patients with coronary heart disease. *International Journal of Behavioral Medicine, 18*(3), 277–284. https://doi.org/10.1007/s12529-010-9120-y.

Yu, X., & Zhang, J. (2006). Application of type D personality scale (DS14) in Chinese college students. *Chinese Mental Health Journal, 20*(5), 313–316.

Zhang, S., Zhang, Q., & Li, C. (2015). Meta-analytic review on the gender differences in perceived social support. *Psychological Development and Education, 31*(4), 393–401.

Zhang, X. (2006). A correlation study of the characteristics of college students' attribution of study success or failure and their metal health. *Psychological Science, 29*(6), 1474–1476.