Humor Styles Moderate the Relationship Between Rumination and Mental Health in Community Residents

Shu Ping Chuang¹, Jo Yung Wei Wu², and Chien Shu Wang³

Abstract
The present study investigated how humor styles moderate the associations between rumination and mental health (depressive symptoms, satisfaction with life, and positive mental health) in community residents. Participants (N = 382) were assessed with the Ruminative Response Scale (RRS), Humor Styles Questionnaire (HSQ), Center for Epidemiological Studies Depression Scale (CES-D), Satisfaction With Life Scale (SWLS), and Positive Mental Health Scale (PMH-scale). Hayes’ PROCESS macro revealed that rumination had a direct effect on depressive symptoms and was moderated by affiliative humor, self-enhancing humor, and aggressive humor, respectively. The relationship between rumination and satisfaction with life was moderated by self-enhancing humor, aggressive humor, and self-defeating humor, respectively. Affiliative humor, self-enhancing humor, and aggressive humor were moderators in the relation between rumination and positive mental health. This study revealed that different humor styles have varying impacts between rumination and mental health. It is crucial for healthcare professionals to promote the importance of using adaptive humor styles to improve mental health.

Keywords
rumination, humor styles, mental health, community adults

Introduction
Rumination occurs when a person focuses on negative and repetitive thoughts of distressing symptoms and its possible causes and effects (Nolen-Hoeksema & Morrow, 1993). Rumination is considered to be a trait-like characteristic and is present as a spectrum in both the depressed and general population (Lavender & Watkins, 2004; Moberly & Watkins, 2008; Smith et al., 2009). Many studies found that a higher rumination level was correlated with depression and anxiety (Berman et al., 2011; Hamilton et al., 2011; Vanhalst et al., 2012), especially in the clinical population (Hanssen et al., 2018; Russoc et al., 2015). The results by Wilkinson et al. (2013) found that higher rumination scores predicted significantly more depressive symptoms among healthy adolescents at a 12-month follow-up. Gan et al. (2015) revealed that rumination was a significant predictor for depressive symptoms of elderly adults in nursing homes at a 6-month follow-up. A longitudinal study found that rumination predicted a residual change of depressive symptoms in community adults (Whisman et al., 2020). Zanon et al. (2016) demonstrated that life satisfaction was negatively correlated with rumination in university students. Self-rumination was negatively associated with happiness in university students (Sariçam, 2016). These results imply that an individual who is healthy but has the tendency to ruminate may easily become depressed. In addition to focusing on the impact of rumination on depression, this study also examined the relationship between rumination and positive mental health in community adults.

Martin et al. (2003) addressed that multidimensional humor styles reflected the ways people habitually used humor in daily life, which may have adaptive and maladaptive consequences (Kuiper et al., 2004). Several studies showed that affiliative and self-enhancing humor were negatively correlated with psychological disturbances, such as perceived stress, loneliness, suicide ideation and depressive, and anxiety symptoms in university students (Cann et al., 2010; Fitts et al., 2009; Tucker, Judah et al., 2013; Tucker,

¹Zuoying Branch of Kaohsiung Armed Forces General Hospital
²Good-Day Psychology Clinic, Tainan
³Kaohsiung Armed Forces General Hospital

Corresponding Author:
Shu Ping Chuang, Department of Psychiatry, Zuoying Branch of Kaohsiung Armed Forces General Hospital, No. 553, Juinshiau Road, Zuoying District, Kaohsiung 81342.
Email: xota5139@gmail.com

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Wingate et al., 2013). Dyck and Holtzman (2013) found that these two types of positive humor styles were correlated with greater well-being, while self-defeating humor was associated with worse well-being among undergraduate students. The results by Ford et al. (2014) indicated that self-defeating and affiliative humor were positively associated with happiness, while the two negative humor styles (self-defeating and aggressive) were negatively associated with happiness in community adults. A meta-analytic study indicated that affiliative and self-enhancing humor styles were positively associated with mental health (self-esteem, life satisfaction, optimism, depression) while self-defeating humor was negatively associated with mental health. However, aggressive humor was not correlated with mental health (Schneider et al., 2018). Therefore, positive and negative humor styles may have different effects on mental health and well-being.

One study found that among undergraduate students with high rumination, those with high affiliative and/or self-enhancing humor styles scored significantly lower levels of depressive symptoms than individuals with low affiliative and/or self-enhancing humor (Olson et al., 2005). However, to our knowledge, there is a lack of investigation between the effect of rumination and humor styles on depressive symptoms among community adults. The relationships between rumination and humor styles are important for understanding the impact of rumination and humor styles on depression and positive mental health in community adults.

The first purpose of this study was to explore (1) the moderating effect of humor styles on the relationships between the rumination of mental health in community adults. The present study has the following hypotheses: (a) different humor styles may moderate the relationship between rumination and depressive symptoms. (b) different humor styles may have a moderation effect between rumination and satisfaction with life. (c) The relationship between rumination and positive mental health may be moderated by different humor styles. Figure 1 provided a conceptual model of the moderation effect of these proposed associations. The second purpose of this study was to investigate (2) the differences between rumination, humor styles and mental health in young, middle-aged, and elderly adults.

Method

Participants and Procedures

The study protocol was reviewed and approved by the Kaohsiung armed forces general hospital institutional review board. Prior to receiving assessments, written informed consent was obtained from all participants. Researches recruited 382 adults through a combination of posters, email newsletters, and online advertising in Kaohsiung city, Taiwan. Participants were excluded if they are currently receiving psychiatric medication or have a physical disease (including cancer and nervous system diseases) which may impact their perceived mental health. Of the total 382 participants, there were 146 (38.2%) men and 226 (61.8%) women. We divided these participants into three groups: young (ages 20–39; n=148), middle-aged (ages 40–59; n=155) and elderly adults (ages 60 and above; n=79).

Measures

Ruminative Response Scale (RRS). The Ruminative response scale has good internal consistency and validity and was employed to measure rumination (Nolen-Hoeksema & Morrow, 1991). The scale contains 22 items, and participants are asked to rate the extent of different aspects of rumination. These responses included focusing on self (reflection), depressive symptoms (depression-related rumination), and the causes and consequences of the mood (brooding) on a four Likert scale from 1 (“almost never”) to 4 (“almost always”). Total scores ranged from 22 to 88, with higher scores indicating higher levels of ruminative coping responses (Treynor et al., 2003). The original scale was translated into Mandarin Chinese and participants received the RSS—Chinese version. Internal reliability of this RSS is Cronbach’s α = .93.

The Humor Styles Questionnaire (HSQ). The humor styles questionnaire (HSQ) is a 32-item self-report questionnaire which includes four subscales: affiliative humor (e.g., “I don’t often joke around with my friends”) (this was coded as a reverse item), self-enhancing humor (e.g., “Even when I am by myself, I am often amused by the absurdities of life”), aggressive humor (e.g., “If someone makes a mistake, I will often tease them about it”), and self-defeating humor (e.g., “I let people laugh at me or make fun at my expense more than I should”). Participants are asked to rate the extent to which they agree with the statements on a 7-point Likert-type scale from 1 (“Totally disagree”) to 7 (“Totally agree”). The HSQ has shown good reliability and validity and higher scores indicated that participants have a particular humor style (Martin et al., 2003). The original scale was translated into Mandarin Chinese and participants received HSQ—Chinese version. Internal reliability of the HSQ is Cronbach’s α = .76.

Center for Epidemiological Studies Depression Scale (CES-D). The Center for epidemiological studies-depression (CES-D) scale is a 20-item questionnaire used to evaluate the frequency of depressive symptoms in the previous week. Participants are asked to rate these statements on a 4-point Likert scale ranging from 0 (rarely or none of the time) to 3 (most or all the time). Total scores can range from 0 to 60; scores of 16 and higher indicated greater depressive symptoms, suggesting such individuals at risk for clinical depression (Radloff, 1977). The Chinese version of the CES-D was used in this study (Chien & Cheng, 1985).
The Satisfaction with Life Scale (SWLS). The Satisfaction with life scale is a 5-item questionnaire measured on a 7-point Likert-type scale and assesses global cognitive judgments of satisfaction with one’s life. Some example questions from the scale include: “In most ways my life is close to my ideal,” and “Generally speaking, my life is close to my ideal.” Higher scores indicated a higher life satisfaction (Diener et al., 1985). The original scale was translated into Mandarin Chinese and participants received SWLS—Chinese version. Internal reliability of this SWLS is Cronbach’s $\alpha = .93$.

The Positive Mental Health Scale (PMH-scale). The 9-item Positive mental health scale was used to assess emotional aspects of well-being related to positive mental health. Participants were asked to respond to statements such as “I am often carefree and in good spirits,” “All in all, I am satisfied with my life,” “I am in good physical and emotional condition,” “I feel that I am actually well equipped to deal with life and its difficulties” on a scale ranging from 0 (I disagree) to 3 (I agree) (Lukat et al., 2016). The original scale was translated into Mandarin Chinese and participants received the PMH—Chinese version. Internal reliability of this PMH-scale is Cronbach’s $\alpha = .91$.

All statistical analyses were performed using SPSS 25.0 software and Hayes’ PROCESS macro. Mean standard deviation and percentages were calculated. For all significant effects, an alpha level of .05 was applied. We performed Pearson correlation among rumination, humor styles, depressive symptoms, satisfaction with life, and positive mental health. The Student’s $t$-test and one way ANOVA were used to examine group differences in parametric variables. Moderation analysis was performed by the means of regression analysis with bootstrapping using the Hayes PROCESS macro model 1 (Baron & Kenny, 1986; Hayes, 2013). A moderation analysis was used to assess the association between the independent variable (IV) (rumination), dependent variables (depressive symptoms, satisfaction with life, and positive mental health), and hypothesized moderator (MR) (humor styles) (Baron & Kenny, 1986). The PROCESS calculates direct, two-way interaction effects for low ($-1SD$), mean ($M$) and high ($+1SD$) levels of the moderators, as well as their confidence intervals (CIs) and bootstrapping.
application (1,000 samples). The test of slope differences was performed if the interaction was significant (Dawson, 2014). Moderation models were adjusted for the covariates of age and sex in the regression.

**Results**

**Descriptive Statistics**

Demographic characteristics and clinical measures of 382 participants are presented in Tables 1 and 2. Most participants were married (65.2%), employed (74.6%) and had an education level of senior high school (91.6%).

Rumination had a moderate positive correlation with depressive symptoms. Rumination had a moderate negative correlation with satisfaction with life and positive mental health, respectively. Rumination was found to have a weak negative correlation with affiliative humor and self-enhancing humor subscales, and a weak positive correlation with self-defeating humor subscales. Affiliative humor and self-enhancing humor subscales had a weak negative correlation with depressive symptoms and a weak positive correlation with satisfaction with life and positive mental health, respectively.

Aggressive humor and self-defeating humor subscales had a weak positive correlation with depressive symptoms, respectively. Aggressive humor was found to have a weak negative correlation with satisfaction with life (Table 3)

**Results**

**Difference in Clinical Measures of the Age and Gender Groups**

The elderly group had higher scores of satisfaction with life than the young and middle-aged groups ($p < .05$). Females had higher scores of positive mental health than males ($p < .05$) (Table 4).

**Humor Styles as a Moderator of Rumination and Mental Health**

As summarized in Table 5, affiliative humor, self-enhancing humor, and aggressive humor moderated the relationship between rumination and depressive symptoms, respectively ($b = -0.01$, $p = .037$; $b = -0.24$, $p < .001$; $b = -0.01$, $p = .008$). Self-defeating humor did not moderate the relationship between rumination and depressive symptoms ($b = -0.01$, $p = .565$). The main effect of rumination was also significant in each association, respectively ($b = 0.42$, $p < .001$; $b = 0.41$, $p < .001$; $b = 0.45$, $p < .001$). The interaction effect of the affiliative humor, self-enhancing humor, aggressive humor, and rumination on depressive symptoms are shown in Figure 2, meaning that as the affiliative humor and self-enhancing humor increase, there is less negative impact between rumination and depressive symptoms, respectively and when the aggressive humor increases, there is more negative impact between rumination and depressive symptoms.

Based on Tables 6 and 7, it can be confirmed that self-enhancing humor, aggressive humor, and self-defeating humor moderated the relationship between rumination and mental health.
satisfaction with life, respectively ($b = 0.01$, $p < .001$; $b = 0.014$, $p = .007$; $b = 0.009$, $p = .026$). Affiliative humor was not a moderator between rumination and satisfaction with life ($b = -0.002$, $p = .663$). Affiliative humor, self-enhancing humor, and aggressive humor moderated the relationship between rumination and positive mental health, respectively ($b = 0.006$, $p = .039$; $b = 0.01$, $p < .001$; $b = 0.008$, $p = .007$). The main effect of rumination was also significant in each association, respectively ($b = -0.17$, $p < .001$; $b = -0.15$, $p < .001$; $b = -0.18$, $p < .001$). The interaction effects of self-enhancing humor, aggressive humor, self-defeating humor, and rumination on satisfaction with life were shown in Figure 3, respectively, suggesting that people with higher levels of self-enhancing humor reported high rumination and higher satisfaction with life; when aggressive humor increased, there is more negative impact between rumination and satisfaction with life. People with higher levels of self-defeating humor reported low rumination and lower satisfaction with life.

Figure 4 displayed the two-way interaction effect of affiliative humor, self-enhancing humor, and aggressive humor between rumination and positive mental health, respectively, meaning that when affiliative humor and self-enhancing humor increased, a positive impact between rumination and positive mental health also increased. Additionally, people with higher aggressive humor reported low rumination and lower positive mental health. Self-defeating humor did not moderate the relationship between rumination and positive mental health ($b = 0.003$, $p = .180$).

### Discussion

The present study found a direct link between rumination and humor styles and mental health (including depressive symptom, satisfaction with life, and positive mental health), and established the moderation effect of different humor styles in the association.

Consistent with previous studies, we found that among people with high rumination, those with high affiliative or/ self-enhancing humor reported significantly lower depressive symptoms than those with low affiliative or/self-enhancing humor (Olson et al., 2005). Rumination was a main effect between the relationship of depressive symptoms, satisfaction with life and positive mental health. Consistent with
previous studies that showed people with higher rumination were more likely to experience more depressive complaints (Berman et al., 2011; Gan et al., 2015; Hamilton et al., 2011; Vanhalst et al., 2012; Wilkinson et al., 2013), this study also found that higher depression-related rumination and brooding rumination increased the risk of developing more depressive symptoms and decrease of well-being in community adults. The depression-related rumination is focused on one’s negative mood and thinking and brooding rumination involves current distress from a self-critical

| Variables                                    | Coefficient (95% CI)     | p Value |
|----------------------------------------------|--------------------------|---------|
| Rumination                                   | 0.42 (0.34–0.49)         | <.001***|
| Affiliative humor                            | −0.39 (−0.50 to −0.29)   | <.001***|
| Rumination × affiliative humor                | −0.01 (−0.021 to −0.001) | .037*   |
| Model R²                                     | .37                      | <.001***|
| Self-enhancing humor                         | 0.41 (0.33–0.48)         | <.001***|
| Rumination × self-enhancing humor            | −0.41 (−0.51 to −0.31)   | <.001***|
| Model R²                                     | −0.24 (−0.03 to −0.01)   | <.001***|
| Model R²                                     | .38                      | <.001***|
| Affiliative humor                            | −0.01 (−0.021 to −0.001) | .037*   |
| Model R²                                     | .28                      | <.001***|
| Self-enhancing humor                         | 0.45 (0.37–0.53)         | <.001***|
| Self-defeating humor                         | 0.11 (0.01–0.23)         | .049*   |
| Self-defeating humor                         | −0.01 (−0.027 to 0.004)  | .565    |
| Model R²                                     | .27                      | <.001***|

Note. Adjusted for age and gender.
*p < .05. **p < .01. ***p < .001.

Figure 2. Affiliative humor, self-enhancing humor, and aggressive humor as a moderator of rumination and depressive symptoms in community adults, respectively.
perspective (Treynor et al., 2003). Rumination is a cognitive risk factor for mental health. Previous studies suggest that both rumination and negative cognitive styles were positively correlated with depressive symptoms (Ciesla & Roberts, 2007; Robinson & Alloy, 2003). Negative cognitive styles include catastrophizing, emotional reasoning, extremes, labeling, and so on as common cognitive distortions (Beck, 1963, 1987; Knapp & Beck, 2008) and irrational beliefs. The core irrational beliefs is demandingness which refers to absolutistic requirements such as “must’s and should’s” (David et al., 2010; Ellis, 1976), awfulizing beliefs, low frustration tolerance and pervasive negative evaluation about oneself and the world which would affect individuals’ mood and behavior.

In this study, we also found that among individuals with high rumination, those with positive humor styles (affiliative humor or self-enhancing humor) reported higher satisfaction with life and positive mental health, suggesting that people with higher positive humors were more likely to have a positive impact in mental health. Similarly, previous research has also found that self-enhancing humor was related to happiness (Ford et al., 2014). Affiliative humor

| Table 6. Moderating Effect of Humor Styles in the Association Between Rumination and Satisfaction With Life (n = 382). |
| --- |
| Variables | Coefficient (95% CI) | p Value |
| Rumination | −0.28 (−0.35 to −0.21) | <.001*** |
| Affiliative humor | 0.18 (0.08–0.27) | <.001*** |
| Rumination × affiliative humor | −0.002 (−0.011–0.007) | .663 |
| Model R² | .21 | <.001*** |
| Rumination | −0.26 (−0.33 to −0.20) | <.001*** |
| Self-enhancing humor | 0.27 (0.18–0.36) | <.001*** |
| Rumination × self-enhancing humor | 0.01 (0.009–0.027) | <.001*** |
| Model R² | .26 | <.001*** |
| Rumination | −0.29 (−0.36 to −0.22) | <.001*** |
| Aggressive humor | −0.08 (−0.18–0.01) | .011* |
| Rumination × aggressive humor | 0.014 (0.004–0.024) | .007** |
| Model R² | .20 | <.001*** |
| Rumination | −0.31 (−0.38 to −0.24) | <.001*** |
| Self-defeating humor | 0.008 (−0.07–0.09) | .846 |
| Rumination × self-defeating humor | 0.009 (0.001–0.10) | .026* |
| Model R² | .19 | <.001*** |

Note. Adjusted for age and gender. *p < .05. **p < .01. ***p < .001.

| Table 7. Moderating Effect of Humor Styles in the Association Between Rumination and Positive Mental Health (n = 382). |
| --- |
| Variables | Coefficient (95% CI) | p Value |
| Rumination | −0.17 (−0.21 to −0.13) | <.001*** |
| Affiliative humor | 0.11 (0.06–0.17) | <.001*** |
| Rumination × affiliative humor | 0.006 (0.000–0.011) | .039* |
| Model R² | .22 | <.001*** |
| Rumination | −0.15 (−0.19 to −0.12) | <.001*** |
| Self-enhancing humor | 0.19 (0.13–0.24) | <.001*** |
| Rumination × self-enhancing humor | 0.01 (0.005–0.016) | <.001*** |
| Model R² | .28 | <.001*** |
| Rumination | −0.18 (−0.22 to −0.14) | <.001*** |
| Aggressive humor | 0.005 (−0.05 to 0.06) | .852 |
| Rumination × aggressive humor | 0.008 (0.002–0.14) | .007** |
| Model R² | .19 | <.001*** |
| Rumination | −0.18 (−0.23 to −0.14) | <.001*** |
| Self-defeating humor | 0.02 (−0.028 to 0.07) | .396 |
| Rumination × self-defeating humor | 0.003 (−0.001 to 0.008) | .180 |
| Model R² | .18 | <.001*** |

Note. Adjusted for age and gender. *p < .05. **p < .01. ***p < .001.
Figure 3. Self-enhancing humor, aggressive humor, and self-defeating humor as a moderator of rumination and satisfaction with life in community adults.

Figure 4. Affiliative humor, self-enhancing humor, and aggressive humor as a moderator of rumination and positive mental health in community adults, respectively.
was considered to facilitate relationships and minimize social tension. Self-enhancing humor includes a tendency for one to be amused by incongruities and have a cheerful outlook in life. These two types of positive humor were associated with emotional well-being, positive affect and negatively associated with depression, anxiety, and rumination (Martin, 2007). We also found that when aggressive humor increases, there was more negative impact between rumination and depressive symptoms, suggesting that people with high aggressive humor who reported high rumination were more likely to have depressive symptoms. When aggressive humor increased, there was more negative impact between rumination and satisfaction with life. Individuals with high self-defeating humor and high aggressive humor who reported low rumination have lower satisfaction and lower positive mental health, respectively. Other studies have similar findings that aggressive humor and self-defeating humor have negative effect on happiness and psychological well-being (Ford et al., 2014; Kuiper & McHale, 2009). In this study, we also found that when people with above a moderate level of rumination have high self-defeating humor and high aggressive humor, they have higher satisfaction with life and positive mental health, respectively. Other results indicated that aggressive humor and self-defeating humor were positively associated with neuroticism personality trait (Martin et al., 2003). The results of Miller et al. (2018) found that vulnerable narcissism and neuroticism shared similar personality characteristics. It is probable that when individuals experience more negative thinking which could lead to an increase of vulnerability, they may amplify self-rated positive mental health. The content of SWLS and PMH included satisfaction with oneself, goals and aspects of life which evaluated global satisfaction. Therefore, further research is needed to explore the moderating effect of self-defeating humor and aggressive humor between rumination and positive mental health.

Limitations

Longitudinal research is needed to examine the moderating effect of humor styles in the relationships between rumination and mental health across the lifespan in community adults. Our results require that caution be taken if trying to infer the study results to clinical samples, especially those diagnosed with severely impaired physical and mental health. The study data were acquired from an urban city and the present study sample was recruited through a non-probability sampling technique; therefore, our results may not be representative of the entire general population. Furthermore, data collected using a self-reported questionnaire might be subjected to social desirability bias.

This study demonstrated that humor styles moderated the relationship between rumination and mental health. The results of this study have important implications for psychotherapy. From a treatment perspective, study results indicated the need to target cognitive distortions toward oneself and to increase the use of positive humor styles to decrease depressive symptoms and improve well-being. Such psychological interventions or humor training may be useful for individuals who have a ruminative cognitive style (Nolen-Hoeksema, 2000; Tagalidou et al., 2019). However, future research is needed to examine the specific mechanisms through which rumination and humor styles may confer risks for mental health.

Declaration of Conflicting Interests

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ORCID iD

Shu Ping Chuang https://orcid.org/0000-0001-7196-0496

References

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173–1182.

Beck, A. T. (1963). Thinking and depression: I. Idiosyncratic content and cognitive distortions. *Archives of General Psychiatry, 9*, 324–333.

Beck, A. T. (1987). Cognitive models of depression. *Journal of Cognitive Psychotherapy, 1*, 5–37.

Berman, M. G., Peltier, S., Nee, D. E., Kross, E., Deldin, P. J., & Jonides, J. (2011). Depression, rumination and the default network. *Social Cognitive and Affective Neuroscience, 6*, 548–555.

Cann, A., Stilwell, K., & Taku, K. (2010). Humor styles, positive personality and health. *Europe’s Journal of Psychology, 6*, 213–235.

Chien, C. P., & Cheng, T. A. (1985). Depression in Taiwan: Epidemiological survey utilizing CES-D. *Bulletin of Japanese Society of Neurology and Psychiatry, 87*, 335–338.

Ciesla, J. A., & Roberts, J. E. (2007). Rumination, negative cognition, and their interactive effects on depressed mood. *Emotion, 7*, 555–565.

David, D., Lynn, S. J., & Ellis, A. (Eds.). (2010). *Rational and irrational beliefs: Research, theory, and clinical practice*. Oxford University Press.

Dawson, J. F. (2014). Moderation in management research: What, why, when and how. *Journal of Business and Psychology, 29*(1), 1–19.

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment, 49*(1), 71–75.
Dyck, K. T. H., & Holtzman, S. (2013). Understanding humor styles and well-being: The importance of social relationships and gender. *Personality and Individual Differences, 55*, 53–58.

Ellis, A. (1976). The biological basis of human irrationality. *Journal of Individual Psychology, 32*, 145–168.

Fitts, S. D., Sebby, R. A., & Zlokovich, M. S. (2009). Humor styles as mediators of the shyness loneliness relationship. *North American Journal of Psychology, 11*, 257–272.

Ford, T. E., McCreight, K. A., & Richardson, K. (2014). Affective style, humor styles and happiness. *Europe’s Journal of Psychology, 10*, 451–463.

Gan, P., Xie, Y., Duan, W., Deng, Q., & Yu, X. (2015). Ruminantion and loneliness independently predict six-month later depression symptoms among Chinese elderly in nursing homes. *PLoS One, 10*(9), e0137176.

Hamilton, J. P., Furman, D. J., Chang, C., Thomason, M. E., Dennis, E., & Gotlib, I. H. (2011). Default-mode and task-positive network activity in major depressive disorder: Implications for adaptive and maladaptive rumination. *Biological Psychiatry, 70*(4), 327–333.

Hanssen, I., Regeer, E. J., Schut, D., & Boelen, P. A. (2018). Ruminative and dampening responses to positive affect in bipolar disorder and major depressive disorder. *Comprehensive Psychiatry, 85*, 72–77.

Hayes, A. (2013). *An introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford.

Knapp, P., & Beck, A. T. (2008). Cognitive therapy: Foundations, conceptual models, applications and research. *The British Journal of Psychiatry, 30*(Suppl 2), s54–s64.

Kuiper, N. A., Grimshaw, M., Leite, C., & Kirsh, G. (2004). Humor is not always the best medicine: Specific components of sense of humor and psychological well-being. *Humor: International Journal of Humor Research, 17*, 135–168.

Kuiper, N. A., & Mc Hale, N. (2009). Humor styles as mediators between self-evaluative standards and psychological well-being. *The Journal of Psychology, 143*(4), 359–376.

Lavender, A., & Watkins, E. (2004). Ruminantion and future thinking in depression. *British Journal of Clinical Psychology, 43*, 129–142.

Lukat, J., Margraf, J., Lutz, R., van der Veld, W. M., & Becker, E. S. (2016). Psychometric properties of the PositiveMental Health Scale (PMH-scale). *BMC Psychology, 4*, 8.

Martin, R. A. (2007). *The psychology of humor: An integrative approach*. Elsevier.

Martin, R. A., Puhlik-Doris, P., Larsen, G., Gray, J., & Weir, K. (2003). Individual differences in uses of humor and their relation to psychological well-being: Development of the humor styles questionnaire. *Journal of Research in Personality, 37*, 48–75.

Miller, J. D., Lynam, D. R., Vize, C., Crowe, M., Sleep, C., Maples-Keller, J. L., Few, L. R., & Campbell, W. K. (2018). Vulnerable narcissism is (mostly) a disorder of neuroticism. *Journal of Personality, 86*(2), 186–199.

Moberly, N. J., & Watkins, E. R. (2008). Ruminative self-focus and negative affect: An experience sampling study. *Journal of Abnormal Psychology, 117*, 314–323.

Mukaka, M. M. (2012). Statistics corner: A guide to appropriate use of correlation coefficient in medical research. *Malawi Medical Journal, 24*, 69–71.

Nolen-Hoeksema, S. (2000). The role of rumination in depressive disorders and mixed anxiety/depressive symptoms. *Journal of Abnormal Psychology, 109*, 504–511.

Nolen-Hoeksema, S., & Morrow, J. (1991). A prospective study of depression and posttraumatic stress symptoms after a natural disaster: The 1989 Loma Prieta earthquake. *Journal of Personality and Social Psychology, 61*(1), 115–121.

Nolen-Hoeksema, S., & Morrow, J. (1993). Effects of rumination and distraction on naturally occurring depressed mood. *Cognition & Emotion, 7*, 561–570.

Olson, M. L., Hugelshofer, D. S., Kwon, P., & Reff, R. C. (2005). Ruminantion and dysphoria: The buffering role of adaptive forms of humor. *Personality and Individual Differences, 39*, 1419–1428.

Overholser, B. R., & Sowinski, K. M. (2008). Biostatistics primer: Part 2. *Nutrition in Clinical Practice, 23*, 76–84.

Radloff, L. S. (1977). The CES-D scale: A self report depression scale for research in the general population. *Applied Psychological Measurement, 1*, 385–401.

Robinson, M. S., & Alloy, L. B. (2003). Negative cognitive styles and stress-reactive rumination interact to predict depression: A prospective study. *Cognitive Therapy and Research, 27*, 275–291.

Ruscio, A. M., Gentes, E. L., Jones, J. D., Hallion, L. S., Coleman, E. S., & Swendsen, J. (2015). Rumination predicts heightened responding to stressful life events in major depressive disorder and generalized anxiety disorder. *Journal of Abnormal Psychology, 124*(1), 17–26.

Sariçam, H. (2016). Examining the relationship between self-rumination and happiness: The mediating and moderating role of subjective vitality. *Universitas Psychologica, 15*, 383–396.

Schneider, M., Voracek, M., & Tran, U. S. (2018). A joke a day keeps the doctor away? Meta-analytical evidence of differential associations of habitual humor styles with mental health. *Scandinavian Journal of Psychology, 59*, 289–300.

Smith, S. M., Fox, P. T., Miller, K. L., Glahn, D. C., Fox, P. M., Mackay, C. E., Filippini, N., Watkins, K. E., Toro, R., Laird, A. R., & Beckmann, C. F. (2009). Correspondence of the brain’s functional architecture during activation and rest. *Proceedings of the National Academy of Sciences of the United States of America, 106*, 13040–13045.

Tagalidou, N., Distlberger, E., Loderer, V., & Lairerre, A. R. (2019). Efficacy and feasibility of a humor training for people suffering from depression, anxiety, and adjustment disorder: A randomized controlled trial. *BMC Psychiatry, 19*(1), 93.

Treynor, W., Gonzalez, R., & Nolen-Hoeksema, S. (2003). Rumination reconsidered: A psychometric analysis. *Cognitive Therapy and Research, 27*(3), 247–259.

Tucker, R. P., Judah, M. R., O’ Keeve, V. M., Mills, A. C., Lechner, W. V., Davidson, C. L., Grant, D. M., & Wingate, L. R. (2013). Humor styles impact the relationship between symptoms of social anxiety and depression. *Personality and Individual Differences, 55*, 823–827.

Tucker, R. P., Wingate, L. R., O’ Keeve, V. M., Slish, M. L., Judah, M. R., & Rhodeas-Kerswill, S. (2013). The moderating effect of humor style on the relationship between interpersonal predictors of suicide and suicidal ideation. *Personality and Individual Differences, 54*, 610–615.
Vanhalst, J., Luyckx, K., Raes, F., & Goossens, L. (2012). Loneliness and depressive symptoms: The mediating and moderating role of uncontrollable ruminate thoughts. *The Journal of Psychology, 146*, 259–276.

Whisman, M. A., du Pont, A., & Butterworth, P. (2020). Longitudinal associations between rumination and depressive symptoms in a probability sample of adults. *Journal of Affective Disorders, 260*, 680–686.

Wilkinson, P. O., Croudace, T. J., & Goodyer, I. M. (2013). Rumination, anxiety, depressive symptoms and subsequent depression in adolescents at risk for psychopathology: A longitudinal cohort study. *BMC Psychiatry, 13*, 250.

Zanon, C., Hutz, C. S., Reppold, C. T., & Zenger, M. (2016). Are happier people less vulnerable to rumination, anxiety, and post-traumatic stress? Evidence from a large scale disaster. *Psicologia: Reflexão e Crítica, 29*, 20.