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Humor Styles and Negative Affect as Predictors of Different Components of Physical Health

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Abstract
The extent to which humor and negative affect each predict different components of physical health was examined by having 105 participants complete measures of four distinct humor styles, negative affect, and three indices of physical health. An increased number of physical symptoms and more negative attitudes about illness were associated with higher levels of negative affect, but were unrelated to the humor styles. Conversely, three of the humor styles significantly predicted coping strategies for physical ailments and complaints, whereas negative affect did not. Adaptive self-enhancing humor was associated with facilitative coping strategies such as changing perspective, planning, and the effective use of humor. Maladaptive aggressive humor was linked to a more dysfunctional coping pattern that included greater denial and a reduction in the ability to change perspective. These findings reinforce the need to consider more complex models of humor that explicitly address the effects of both adaptive and maladaptive humor styles across a broad range of physical health measures while also considering effects that may be attributable to other highly-relevant attributes, such as negative affect.

Key Words: humor, negative affect, physical symptoms, health attitudes, coping.

It has often been suggested that a greater sense of humor can contribute significantly to well-being. In terms of physical health it has been proposed that increased humor and laughter can enhance immune functioning, increase tolerance of pain, and reduce cardiovascular risk (Martin, 2007). Consistent with these proposals, it has been found that a greater sense of humor is associated with increased immune functioning and a reduction in physical illness symptoms (Carroll & Schmidt, 1992). Other studies, however, have failed to support this proposed

facilitative effect of humor. In particular, those with a greater sense of humor do not always display fewer physical illness symptoms (McClelland & Cheriff, 1997), a reduced risk for cardiovascular disease (Kerkkanen, Kuiper, & Martin, 2004), or show higher levels of immunity (Martin & Dobbin, 1988).

This conflicting evidence has lead several researchers to conclude that further work in this domain needs to incorporate several refinements (Kuiper, Grimshaw, Leite, & Kirsh, 2004; Kuiper & Nicholl, 2004; Martin, 2001; Martin, 2007). First, it has been recommended that research should include contemporary models of humor that explicitly differentiate between adaptive and maladaptive humor styles (e.g., self-enhancing vs. self-defeating humor). Second, it has been suggested that the inclusion of a much broader range of physical health measures (including attitudes about health and coping with physical health concerns), would help clarify how sense of humor may play a role in enhancing physical health. Finally, it has been proposed that further individual difference characteristics that are already known to be highly relevant to physical health issues, such as negative affect (Watson, Clarke & Tellegen, 1988), should also be included in any research studies. As described below, these three refinements provide the conceptual framework for the present investigation of humor and physical health.

Distinguishing Adaptive and Maladaptive Humor Styles.

Past research examining the relationship between humor and physical health has generally assumed that sense of humor is a positive attribute, and thus could only serve to facilitate (but never harm) well-being. In contrast to this notion, contemporary research has clearly documented the existence of both adaptive *and* maladaptive humor styles (Martin, 2007). The two adaptive styles are self-enhancing and affiliative humor; whereas the two maladaptive styles are self-defeating and aggressive humor. Self-enhancing humor involves a generally humorous outlook on life, even in the face of adversity. These individuals use humor to effectively cope with emotional regulation of stress, but do so in a manner that does not harm self or others. Affiliative humor involves using wit and benign humor to amuse others, and facilitate social and interpersonal relationships. In contrast, those high in self-defeating humor amuse others by making themselves "the butt of the joke", which involves ridiculing themselves to gain approval from others. Finally, aggressive humor involves sarcasm, ridicule, and teasing; and is specifically intended to put down and insult others. These four humor styles are assessed via the Humor Styles Questionnaire (HSQ: Martin, Puhlik-Doris, Larsen, Gray & Weir, 2003), with a number of studies now providing strong converging evidence for the existence of

these four distinct styles across diverse groups and cultures (Chen & Martin, 2007; Kuiper et al., 2004; Martin, 2007).

Of special interest is that these adaptive and maladaptive humor styles show quite different relationships with *psychological* well-being. A number of studies have now demonstrated that higher levels of adaptive humor (self-enhancing, affiliative) are related to greater psychological well-being, as characterized by less depression, less anxiety and higher self-esteem (Chen & Martin, 2007; Kuiper et al., 2004; Kuiper & McHale, in press). In contrast, higher levels of the maladaptive style of self-defeating humor have typically been associated with exactly the *opposite* pattern of well-being, namely, increased depression, greater anxiety and reduced self-esteem. These distinctions has rarely been considered when examining sense of humor and physical health domains. As such, one goal of the present study was to explore the extent to which each of the adaptive and maladaptive humor styles may potentially relate, in a differential manner, to the physical health constructs described below.

Considering a Broader Range of Physical Health Measures.

Many of the studies examining relationships between humor and physical health have focused on the traditional research areas of physical symptom reporting, immunity levels, or tolerance for pain (Martin, 2001). In contrast, Kuiper and Nicholl (2004) examined not only physical health symptoms, but also attitudes towards a variety of physical health issues. Of particular interest was that higher liking of humor (one facet of a positive sense of humor) was associated with a significant reduction in fear of death, bodily preoccupation and worry about illness; but was completely unrelated to the number of physical symptoms reported. In contrast, coping humor (another positive facet of sense of humor) showed quite a different pattern, as it was completely unrelated to fear of death, but was associated with fewer physical symptoms. In light of this differential pattern, the present study assessed several components of physical health, including physical symptoms, attitudes about physical health issues, and coping strategies for dealing with a variety of common physical health ailments and complaints (e.g., sore throat).

Physical Health and the Important Role of Negative Affect.

Although some studies have demonstrated a significant relationship between sense of humor and physical health, this research has rarely considered the extent to which these effects are actually specific to humor (Kuiper & Nicholl, 2004; Martin, 2001). It may be the case that other potentially relevant individual difference variables

(typically not measured in these studies) may actually account for the observed relationships. As one illustration, Korotkov and Hannah (1994) found that the negative relationship between coping humor and physical symptom reporting was no longer present, once neuroticism levels were taken into account. This result is quite consistent with more general research findings showing that greater negative affect, which is a primary component of neuroticism, is associated with increased illness, disease, and physical symptom reporting (Mayne, 1999; Petrie, Moss-Morris, Grey & Shaw, 2004). These findings are extremely robust, and thus reinforce the need to also include a measure of negative affect in any research that attempts to ascertain the specific impact of humor on physical health. In further accord with this suggestion, past humor research has also shown that individuals with higher levels of self-defeating humor display significantly greater negative affect; whereas much lower levels of negative affect are associated with the two adaptive humor styles of self-enhancing and affiliative humor (Kuiper et al., 2004).

The Present Study

Using the Humor Styles Questionnaire (HSQ) to assess both adaptive and maladaptive humor styles (self-enhancing, affiliative *vs*. self-defeating, aggressive), one goal of this study was to explore any potential relationships between the various humor styles and different aspects of physical health. In response to previous suggestions to consider a much broader array of physical health domains, the present study examined three different aspects of physical health. First, the Pennebaker Inventory of Limbic Languidness (PILL: Pennebaker, 1982) was used to assess the number of physical health symptoms reported. Second, the Illness Attitude Survey (IAS: Kellner, Abbott, Winslow & Pathak, 1987) was used to assess participants' attitudes about several physical health issues, including worry about illness, bodily preoccupation, fear of death, disease phobia, and hypochondrical beliefs. Third, the Health Symptoms Coping Scale (HSCS) was used to determine how individuals would cope with several common physical ailments and complaints, such as a bad headache or sore throat. Here, participants indicated how much they would use coping strategies such as changing perspective, planning, denial, self-blame, and humor when dealing with physical health symptoms.

If sense of humor does play a role in physical health, then the adaptive and maladaptive humor styles may show quite different relationships with the physical health measures. For example, given that those with high levels of self-enhancing humor generally display a more accepting and positive orientation towards their life experiences (Martin, 2007), it may be that these individuals also show the most

facilitative health-related attitudes, along with fewer physical symptoms. Such a pattern would be congruent with prior demonstrations of the use of self-enhancing humor to effectively engage in the regulation of personal stress (Kuiper et al., 2004; Martin et al., 2003; Martin, 2007). In contrast, those with higher levels of self-defeating humor may show the most detrimental attitudes about physical health (e.g., greater worry about illness, higher bodily preoccupation and hypochondrical beliefs), coupled with an increased number of physical symptoms. This pattern would be consistent with the greater level of neuroticism displayed by these individuals (Martin et al., 2003). In terms of coping with common physical health ailments and complaints, greater self-enhancing humor may be associated with an increased ability to change perspective, the greater use of humor to deal with these symptoms, and more effective planning. Such a pattern would be consistent with past findings showing that coping humor (which is closely related to self-enhancing humor) is associated with a greater ability to change one's perspective when faced with stressful events, more approach coping, more planning in problem solving, and more positive appraisals about these events (Abel, 2002; Cann & Etzel, 2008; Erickson & Feldstein, 2007; Kuiper, Martin & Olinger, 1993; Kuiper, McKenzie & Belanger, 1995).

Finally, the last main goal of this study was to consider how negative affect may bear on any relationships between the humor styles and physical health. To begin, we expected that higher levels of negative affect would be associated with greater physical symptom reporting and more negative illness attitudes (e.g., greater worry about illness, increased disease phobia); as this type of relationship has been well-documented in previous research (Mayne, 1999; Petrie et al., 2004). Of further interest was the extent to which the humor styles would still predict physical health, even after negative affect levels have been taken into account. This issue was examined by performing a series of regression analyses in which negative affect was entered as the first predictor, followed by the four humor styles as the second block of predictors. The criterion variables were, in turn, each of the physical health measures (i.e., number of physical symptoms, illness attitudes and coping strategies for physical health symptoms).

As described earlier, prior work has strongly linked negative affect to certain physical health measures (i.e., number of physical symptoms and illness attitudes), with the potential role of humor in these two areas of health being much more equivocal. As such, negative affect may play the primary role in predicting number of physical symptoms and illness attitudes. For coping strategies, however, the relative contribution of humor versus negative affect may be reversed, as considerable prior research has highlighted the extent to which self-enhancing humor can also be

thought of as a coping technique for dealing with the regulation of stressful events (Cann & Etzel, 2008; Martin, 2007). As such, this specific humor style may be the primary predictor of coping strategies used for physical ailments and complaints.

Method

Participants

A total of 105 undergraduate psychology students (76 females and 29 males) participated in partial fulfillment of course requirements. Their mean age was 18.93, and ranged from 17 to 34.

Measures

Humor Styles Questionnaire (HSQ: Martin et al., 2003).
The HSQ is a 32 item self-report measure of four distinct humor styles. The two adaptive styles are Self-Enhancing humor ("My humorous outlook on life keeps me from getting overly upset or depressed about things.") and Affiliative humor ("I enjoy making people laugh."). The two maladaptive styles are Self-Defeating humor ("I let people laugh at me or make fun at my expense more than I should.") and Aggressive humor ("If I don't like someone, I often use humor or teasing to put them down."). There are eight items for each humor style subscale, with participants rating items on a 7-point scale ranging from (1) "Totally Disagree" to (7) "Totally Agree". Psychometrically sound levels of validity and reliability have been demonstrated for the HSQ in prior research (e.g., Chen & Martin, 2007; Kuiper et al., 2004; Martin, 2007).

Pennebaker Inventory of Limbic Languidness (PILL: Pennebaker, 1982).
The PILL consists of 54 items that measure how frequently an individual experiences a wide variety of common physical symptoms, such as "Nausea," "Toothaches," "Eyes water," "Sore muscles," "Leg cramps," "Back pain," and "Dizziness." Participants indicate on a 5-point scale how frequently they have experienced each symptom over the past year. Response options range from (1) "Never or almost never" to (5) "More than once a week." The PILL has acceptable levels of both reliability and validity (Gijsbergs van Wijk & Kolk, 1996; Pennebaker, 1982).

Illness Attitudes Scale (IAS: Kellner et al., 1987).
The IAS is a broad-based self-report measure that assesses a number of different fears, beliefs and attitudes about physical health, including illness, disease, death,

bodily focus, effects of symptoms, health habits and treatment experiences. The IAS contains nine subscales, each with three items. Example items for each subscale are as follows: Worry about Illness (WI) "Are you worried that you will get a serious illness in the future?", Concern about Pain (CP) "If you have a pain, do you worry that it may be caused by a serious illness?", Health Habits (HH) "Do you avoid habits that may be harmful to you, such as smoking?", Hypochondrical Beliefs (HB) "Do you believe that you have a physical disease, but the doctors have not diagnosed it correctly?", Fear of Death (FD) "Does the thought of death scare you?", Diseases Phobia (DP) "Are you afraid that you may have heart disease?", Bodily Preoccupation (BP) "When you notice a sensation in your body, do you find it difficult to think of something else?", Effects of Symptoms (ES) "Do your bodily symptoms stop you from concentrating on what you are doing?", and Treatment Experiences (TE) "How many times have you seen a medical doctor over the past year?" Responses to the first eight subscales are measured on a 5-point scale, ranging from (1) "Never" to (5) "Always". The last subscale (Treatment Experiences) assesses the frequency of use of health care during the past year, with response options being: (1) "Never", (2) "Once", (3) "2 to 3 times", (4) "4 to 5 times", and (5) "6 or more times". As described by Kellner et al. (1987) several studies support the construct validity of the IAS, with factor analytic work indicating the nine subscales are distinct. Reliability of each subscale is also acceptable.

Health Symptoms Coping Scale (HSCS).

The HSCS was constructed specifically for the present study and assesses how individuals cope with common physical symptoms, such as a bad headache, an infected cut, a sore throat with fever, or back pain. This measure uses the 13 coping strategies specified in the brief COPE scale (Carver, 1997). These strategies include: Planning (Think hard about what steps to take to deal with the situation), Humor (Make fun of the situation), Acceptance (Learn to live with the situation), Denial (Refuse to belief the situation has happened), Self-Blame (Blame myself for what has happened), Change in Perspective (View this situation from a different perspective), Appraisal Challenge (View this situation as a positive challenge), and Behavioral Disengagement (Give up the attempt to deal with the situation). Participants were asked to imagine that they were experiencing a given physical symptom (e.g., You have a sore throat with a fever that has lasted all day), and then indicate the degree to which each coping strategy would be typical of their own response. This was done on a 5-point scale with (1) being "Extremely Unlike Me" and (5) being "Extremely Like Me." A score was calculated for each of the 13 coping strategies by averaging across the symptoms sampled by the HSCS. Acceptable psychometric properties for the brief COPE scale are reported by Carver (1997).

Positive and Negative Affect Scale (PANAS: Watson et al., 1988).
The PANAS is a self-report measure of an individual's level of both negative and positive affect. The present study focused only on the negative affect subscale, however, which consists of 10 negative emotional adjectives, such as "upset," "irritable," and "distressed". Participants indicated the extent to which each adjective described them over the past week, using a 5-point scale that ranged from (1) "Very slightly or not at all" to (5) "Extremely". Reliability and validity for the PANAS are both quite acceptable (Gijsbergs van Wijk & Kolk, 1996; Watson et al., 1988).

Procedure

Participants were tested in groups of up to 10 in small seminar rooms at the university. After completing informed consent forms, each participant was given a booklet of measures to complete. The measures in each booklet were in different orders. Completion of the booklet took approximately 30 to 40 minutes, after which participants received a debriefing form explaining the purpose of the study.

Results

The means, standard deviations, and ranges for all of the measures are shown in Table 1 (see Appendix 1). Regression analyses were conducted to determine the degree of predictability afforded by the humor styles, after taking negative affect into account. Negative affect was always entered as the first predictor, followed by the four humor styles (self-enhancing, affiliative, self-defeating and aggressive) as the second predictor block. In turn, each of the physical health measures served as the criterion variable.

Physical Symptoms (PILL). When considering the number of physical symptoms experienced in the last year, the first predictor of negative affect was significant, R^2 = .11, F (1, 103) = 12.05, $p < .001$, indicating that, as expected, higher levels of negative affect predicted significantly more physical symptoms (r = .32, $p < .01$). However, when the four humor styles were next entered into the equation, the incremental $\underline{R}^2$ change of .04 was not significant, F-change (4, 99) = 1.16, ns. This indicates that none of the four humor styles added significantly to the prediction of physical symptoms, above and beyond the significant prediction already afforded by negative affect. Furthermore, even when considering the simple correlations, none of the four humor styles were significantly associated with the number of physical

symptoms reported (simple *r*'s ranged from .02 to .18, ns).

Illness Attitudes and Health Habits (IAS). For all eight of the attitude scales, the regression analyses revealed that negative affect was the only significant predictor, with the subsequent entry of the four humor styles failing to produce any significant increase in predictability. In particular, the eight IAS scales displaying this pattern were: Disease Phobia R^2 = .22, F (1, 103) = 29.79, p < .001, incremental change in R^2 for humor = .02, F-change (4, 99) < 1, ns; Bodily Preoccupation R^2 = .20, F (1, 103) = 25.94, p < .001, incremental change in R^2 for humor = .05, F-change (4, 99) = 1.63, ns; Concern about Pain R^2 = .16, F (1, 103) = 19.81, p < .001, incremental change in R^2 for humor = .04, F-change (4, 99) = 1.09, ns; Worry about Illness R^2 = .11, F (1, 103) = 12.15, p < .001, incremental change in R^2 for humor = .03, F-change (4, 99) < 1, ns; Effects of Symptoms R^2 = .11, F (1, 103) = 12.23, p < .001, incremental change in R^2 for humor = .01, F-change (4,99) < 1, ns; Fear of Death R^2 = .08, F (1, 103) = 8.38, p < .01, incremental change in R^2 for humor = .06, F-change (4, 99) = 1.90, ns; Treatment Experiences R^2 = .07, F (1, 103) = 8.17, p < .01, incremental change in R^2 for humor = .02, F-change (4, 99) < 1, ns; and Hypochondrical Beliefs R^2 = .07, F (1, 103) = 7.44, p < .01, incremental change in R^2 for humor = .08, F-change (4, 99) <1, ns. Finally, when considering the one remaining IAS scale of health habits, the regression analysis indicated that neither negative affect nor humor styles were significant predictors (all F and F-change values < 1.25, ns).

Thus, in accord with predictions, individuals with higher levels of negative affect also showed greater disease phobia (simple r = .47, p < .001); increased bodily preoccupation (r = .45, p < .001); more concern about pain (r = .40, p < .001); greater worry about illness (r = .33, p < .01); greater impact of symptoms (r = .33, p < .01); increased fear of death (r = .27, p < .01); more treatment experiences (r = .27, p < .01); and more hypochondrical beliefs (r = .26, p < .01). In contrast, neither of the two maladaptive humor styles of self-defeating and aggressive humor showed any significant correlations with any of the IAS measures (*r*'s ranged from -.02 to .19, ns). For the adaptive humor styles, higher self-enhancing humor was associated with reduced concern about pain (simple r = -.21, p < .05); and higher affiliative humor was linked to a significant reduction in hypochondrical beliefs (simple r = -.20, p < .05). It is important to note, however, that both of these humor effects were no longer significant, once negative affect was taken into account, via the regression analyses reported above.

Health Symptoms Coping Scale (HSCS). The regression analyses revealed that negative affect was a significant predictor for only one coping strategy, namely,

self-blame, R^2 = .10, F (1, 103) = 11.13, p < .001. This analysis further indicated that the four humor styles did not add significantly to the prediction of self-blame, incremental change in R^2 for humor = .06, F-change (4, 99) = 1.99, ns. Thus, in terms of coping with common physical ailments, those with greater negative affect attributed more blame to themselves (r = .31, p < .01). When considering simple correlations, higher self-defeating humor significantly predicted greater self-blame (r = .23, p < .05). This humor effect, however, was no longer significant when negative affect was considered first in the regression analysis.

The regression analyses also revealed that the humor styles played a significant role in predicting several of the remaining coping strategies, even *after* first considering any potential effects of negative affect. For example, when predicting humor use, negative affect (entered as the first predictor) was not significant, R^2 = .01, F (1,103) = 1.15, ns. However, the subsequent entry of humor styles produced a significant increase in R^2 of .20, F-change (4, 99) = 6.26, p < .001. This resulted in a significant overall regression model, R^2 = .21, F (5, 99) = 5.28, p < .001, in which those with greater self-enhancing humor used more humor in coping with their physical ailments and complaints (r = .42, p < .001). At a simple correlation level, those with higher levels of affiliative humor also used more humor to cope with their physical ailments (r = .24, p < .05), but this humor effect was no longer significant in the regression analysis. Furthermore, neither of the maladaptive humor styles (self-defeating or aggressive) were significantly associated with humor use (r's < .16, ns); thus highlighting the positive self-enhancing focus of this particular coping strategy.

For the planning coping strategy, negative affect was again a non-significant predictor, R^2 = .02, F (1,103) = 2.46, ns. However, the subsequent entry of humor styles resulted in a significant increase in predictability, R^2 change = .08, F-change (4, 99) = 2.50, p < .05; with the final overall regression model being significant, R^2 = .11 F (5, 99) = 2.48, p < .05. Here, those displaying greater self-enhancing humor employed more planning when coping with their physical ailments and concerns (r = .28, p < .01).

Negative affect also failed to predict change in perspective as a coping strategy, R^2 = .002, F (1,103) < 1, ns; whereas the subsequent inclusion of humor styles resulted in a significant increase in R^2 of .14, F-change (4, 99) = 3.92, p < .01. In the overall regression model, higher levels of both self-enhancing and affiliative humor, along with lower levels of aggressive humor, were found to be significant predictors of the greater use of change of perspective as a coping strategy, R^2 = .14, F (5, 99) = 3.20, p < .01.

The use of denial as a coping strategy was not predicted by negative affect, R^2 = .006, F (1,103) < 1, ns; but was significantly predicted by humor styles, R^2 change = .13, F-change (4, 99) = 3.70, $p < .001$. In this overall regression model, both greater aggressive humor and reduced affiliative humor predicted the increased use of denial to cope with physical symptoms, R^2 = .21 F (5, 99) = 3.11, $p < .025$.

Finally, the regression analyses revealed that several of the coping strategies for dealing with physical health ailments and complaints were not significantly predicted by either negative affect or the four humor styles. These strategies were: self-distraction, venting, behavioural disengagement, appraisals of challenge or threat, active coping, acceptance, and positive reframing.

Discussion

The aim of this study was to provide an examination of potential relationships between humor and physical health while also taking into account the impact of negative affect. This examination incorporated three major refinements that have not typically been addressed in prior work. First, we explicitly acknowledged that humor is a multi-faceted construct that includes both adaptive and maladaptive humor styles (i.e., self-enhancing and affiliative vs. self-defeating and aggressive). This approach contrasts with previous work that has generally assumed that humor is only a positive attribute; and thus can only serve to facilitate physical health. As such, our approach allows for an examination of both the facilitative and detrimental effects of various humor styles on physical health. Second, we broadened the range of physical health indices that were examined. Thus, in addition to considering the number of physical symptoms reported, we also assessed attitudes about physical illness and health, along with the typical strategies used to cope with physical health ailments. Third, we also considered the potential impact of negative affect on physical health, as considerable prior research has shown strong and consistent links between greater negative affect and poorer physical health (Mayne, 1999; Petrie et al., 2004).

Number of Physical Symptoms Reported

The prediction that higher levels of negative affect would be associated with a greater number of physical symptoms was clearly supported. This finding is in accord with Mayne's (1999) general conclusion that individuals characterized by higher negative affect have a much greater propensity towards physical health-related concerns. Our results also very clearly indicated that none of the four humor styles

were significantly associated with physical symptoms. Thus, it was *not* the case that greater adaptive humor was associated with a reduction in physical symptoms, or that greater maladaptive humor was associated with an increase in physical symptoms. As such, these findings are consistent with prior work demonstrating that sense of humor is not linked to physical symptoms (McClelland & Cheriff, 1997). Even when one employs a more fine-grained approach to separately consider adaptive and maladaptive styles of humor, there is still very little evidence to support the proposal that sense of humor is related to number of physical symptoms.

Illness Attitudes

In strong support of the negative affect hypothesis (Mayne, 1999: Petrie et al., 2004), we found that higher levels of negative affect predicted significantly greater worry about illness, more concern about pain, greater impact of symptoms, more hypochondrical beliefs, increased bodily preoccupation, greater disease phobia, more treatment experiences, and finally, increased fear of death. As such, these results are consistent with previous research showing similar patterns of associations between greater negative affect and more detrimental attitudes and beliefs about physical health (Mayne, 1999; Petrie et al., 2004). In contrast to these very robust findings for negative affect, our results revealed very little support for the notion that the humor styles relate to attitudes about illness and physical health. At the simple correlational level, higher levels of self-enhancing humor were associated with less concern about pain, and higher levels of affiliative humor were associated with fewer hypochondrical beliefs. Although this pattern is consistent with the proposal that greater adaptive humor may mitigate negative attitudes and beliefs about physical health issues, it is important to note that these effects were no longer evident once negative affect levels were taken into account, via the regression analyses. As such, this pattern clearly highlights the importance of considering other relevant individual difference variables, such as negative affect, when attempting to ascertain the specific role of humor measures. Furthermore, both of the maladaptive humor styles (self-defeating and aggressive) also failed to show any significant relationships with any of the illness attitude measures. When taken together, this pattern strongly suggests that the four humor styles, as assessed in this study, have little to do with attitudes about illness and physical health.

Coping with Physical Ailments and Complaints

Our findings showed that negative affect was generally unrelated to the coping strategies used by individuals to deal with a variety of common physical ailments and complaints. While greater negative affect is strongly associated with more

negative illness attitudes and a greater number of physical symptoms, negative affect has little to do with how individuals cope with physical ailments such as a bad headache or sore throat (the lone exception was an ascription of greater self-blame). These distinctions clearly support the importance of sampling from a broad range of physical health indices when examining the potential impact of any individual difference variables on physical health. This conclusion is further supported by the pattern of findings obtained for the humor styles, which was essentially opposite to that displayed for negative affect. In particular, humor styles showed the most pronounced effects when considering coping strategies for physical health ailments and complaints, but failed to show any effects for either illness attitudes or number of symptoms reported.

Consistent with expectations, the most prominent humor style associated with the coping strategies for physical ailments and complaints was self-enhancing humor. This style incorporates strong elements of coping humor (Martin et al., 2003), and in the present study was predictive of several facilitative strategies for dealing with physical ailments, such as the greater use of humor, changing perspectives, and greater planning. The facilitative coping effects for this adaptive humor style are generally congruent with past work showing that individuals high in coping humor are more likely to see stressful situations from a more positive perspective, inject more humor into the situation, engage in more effective planning and active coping; and thus experience less stress and anxiety (Abel, 2002; Cann & Etzel, 2008; Erikson & Feldstein, 2007; Kuiper et al., 1995).

The coping findings also offered empirical support for the idea that maladaptive humor styles can sometimes function in a manner that is detrimental to physical health. As one illustration, the regression analyses revealed that even after accounting for negative affect levels, higher levels of aggressive humor predicted both greater denial and a reduced ability to change perspective, when dealing with physical symptoms. The dysfunctional coping pattern for this maladaptive humor style is clearly distinct from the facilitative pattern displayed for the adaptive styles, such as self-enhancing humor. As such, this distinction reinforces the importance of considering both adaptive and maladaptive humor styles when exploring the impact of sense of humor on coping in physical health domains.

Conclusions, Limitations and Future Research Directions

Several general conclusions can be drawn from this research. First, it appears important to use multiple measures of physical health across several different

domains in order to provide an appropriate test of the proposed effects of any individual difference construct. In the present study this was evident for both negative affect and humor, as each displayed it own unique patterns of relationships across the various physical health domains. Negative affect was the best predictor of illness attitudes and number of physical symptoms, whereas humor styles were the best predictors of coping strategies. Second, when examining proposed humor effects, it is also important to consider the impact of other highly relevant individual difference variables, such as negative affect. In the present study this was particularly evident for self-enhancing humor, as the relationship of this adaptive humor style with several coping strategies remained significant, ever after taking negative affect into account. Finally, it is important to consider maladaptive as well as adaptive humor styles, as quite different patterns can emerge with respect to physical health indices. In the present study this was primarily evident for the coping strategies, with higher levels of adaptive humor being associated with more facilitative strategies, such as change of perspective and planning; whereas higher levels of maladaptive humor styles predicted more detrimental strategies, such as denial.

Although the present findings are informative, there are a number of limitations that point to future research directions. One consideration is that the present study relied exclusively on self-report measures. Although these measures are generally reliable and valid, it would still be quite useful to expand the range of physical health measures to also include assessments of actual physical health, such as blood pressure, body mass index, or cholesterol levels (e.g., Kerkkanen et al., 2004). A further concern is that the cross-sectional nature of the present study precludes the establishment of any causal relationships between the different variables of interest. Thus, while several relationships between humor styles and coping strategies have been demonstrated, causality among these relationships is unknown. As such, future research might use longitudinal designs that permit a clearer articulation of directionality when examining the use of humor to deal with physical ailments. This work might also use experimental designs that can serve as an analogue to physical complaints (e.g., a cold stressor test). Such designs would allow for pre-selection of individuals high and low on the various humor styles of interest.

Finally, it is important to note that while the present study focused on both adaptive and maladaptive humor styles, there are still other aspects of sense of humor that may be worth further consideration. As one specific example, Kuiper and Nicholl (2004) also examined the relationship between sense of humor and illness attitudes, but focused on an individual's ability to recognize humor in various life situations and their liking of humor. In general contrast to the present study, they found a number

of significant relationships between these particular aspects of sense of humor and illness attitudes. Thus, when taken together with the present results, these finding clearly highlight the complex nature of sense of humor, and further caution against any portrayals of sense of humor as a singular positive construct that only functions to enhance well-being.

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Appendix 1. Table 1

Means, Standard Deviations and Ranges for All Measures

Measures and Subscales	**Mean**	**SD**	**Range**
a) PANAS			
Negative Affect Scale	2.18	.62	1.00 - 4.20
b) Humor Styles Questionnaire (HSQ)			
Affiliative Humor	6.05	.86	1.50 – 7.00
Self-Enhancing Humor	4.87	.92	1.75 – 6.88
Aggressive Humor	3.75	.93	1.88 – 5.75
Self-Defeating Humor	3.65	1.13	1.63 – 6.50
c) Pennebaker Inventory of Limbic Languidness (PILL)			
Symptom Frequency	2.27	.45	1.35– 3.44
d) Illness Attitude Scale (IAS)			
Worry about Illness	3.32	.86	1.33 – 5.00
Concern about Pain	2.81	.81	1.00 – 4.67
Health Habits	3.14	.67	1.00 – 4.67
Hypochondrical Beliefs	1.53	.65	1.00 – 4.33
Fear of Death	2.64	1.03	1.00 – 5.00
Diseases Phobia	1.94	1.03	1.00 – 5.00
Bodily Preoccupation	2.40	.86	1.00 – 4.67
Effects of Symptoms	4.87	.82	1.00 – 4.67
Treatment Experiences	2.69	.79	1.00 – 5.00
e) Health Symptoms Coping Scale (HSCS)			
Humor	3.26	.91	1.00 – 5.00
Appraisal Challenge	2.61	.66	1.00 – 4.00
Appraisal Threat	3.59	.82	1.50 – 5.00
Active Coping	4.07	.74	2.00 – 5.00
Planning	3.12	.79	1.00 – 5.00
Positive Reframing	2.62	.89	1.00 – 4.50
Acceptance	3.04	.89	1.00 – 5.00
Self-Distraction	2.70	.67	1.00 – 5.00
Denial	1.87	.71	1.00 – 4.50
Venting	2.96	1.00	1.00 – 5.00
Behavioural Disengagement	1.78	.68	1.00 – 3.00
Self-Blame	2.07	1.03	1.00 – 5.00
Perspective	2.41	.98	1.00 – 5.00