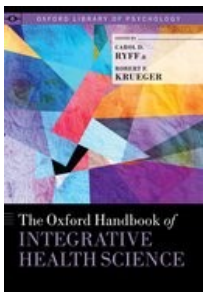

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CHAPTER

28 Anger Expression and Health: The Cultural Moderation Hypothesis

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Abstract

Is anger monolithic, or is it a multifaceted experience with variable functions? We address these questions with MIDUS/MIDJA datasets and provide support for the idea that people express anger for different reasons across cultures. Specifically, in Western societies, people may express anger to vent their frustration. In support of this hypothesis, among Americans, anger expression is more pronounced for those with *lower* social status (who are more vulnerable to frustrating experiences). Moreover, their anger expression is associated with *increased* biological health risk. In contrast, in Asian societies, people may express anger to display social dominance. In support of this hypothesis, among Japanese, anger expression is more pronounced for those with *higher* social status (who have social resources to be dominant). Moreover, their anger expression is associated with *decreased* biological health risk. The chapter concludes with directions for future research.

Keywords: emotion, anger, culture, vented frustration hypothesis, dominance display hypothesis, social status, health, cultural moderation hypothesis, biological health risk

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Introduction

> *Anger is momentary madness, so control your passion or it will control you.*
>
> *—Horace*

Because of its antagonistic and destructive nature, anger is often regarded as a harmful, dangerous, or even immoral emotion that must be avoided or controlled (Frijda, 1986; Haidt, 2003). As illustrated by the opening quotation by the Roman poet Horace (65–8 BC), the view of anger as harmful and dangerous has a long history, dating back to the ancient Greeks. Similarly, in Buddhism, anger is considered as one of the three "poisons" of the mind, along with greed and ignorance, that cause human suffering. More recently, Adam Smith also proposed a similar view by conceptualizing anger as the "greatest poison to the happiness of a good mind" (1759, p. 58).

In view of the negative conceptualization of anger common in the literature, it is not surprising that anger has been widely believed to be unhealthy. Since the time of the ancient Greeks, it has been thought that anger is a serious risk factor for various health problems. The Greek physician Galen (AD 129–200) proposed that the human body is filled with four types of bodily fluids, known as humors (blood, phlegm, yellow bile, and black bile), and argued that too much yellow bile will lead to excessive anger or aggression, which in turn can result in a variety of adverse health consequences by destroying the balance in the humors. Although Galen's humoral theory had no scientific basis, he was partly right. The extant literature provides strong support for Galen's claim, based on both cross-sectional and longitudinal evidence linking
p. 380 anger expression and hostility to compromised health (Chida & Steptoe, ↳ 2009; Everson-Rose & Lewis, 2005; Graham et al., 2006; Schum, Jorgensen, Verhaeghen, Sauro, & Thibodeau, 2003; T. W. Smith, Glazer, Ruiz, & Gallo, 2004; Vandervoort, Ragland, & Syme, 1996). However, it is important to recognize that a small but increasing number of recent investigations challenge the generalizability of these findings by demonstrating that anger expression is often associated with *salubrious* health effects, especially among members of non-Western ethnic minority groups (Consedine, Magai, & Horton, 2005; Consedine et al., 2006) and cultural groups outside of the United States, such as Japanese (Kitayama et al., 2015).

How can it be that anger expression appears beneficial for some and detrimental for others? The aim of this chapter is to provide a comprehensive understanding of a link between anger expression and health by proposing that these divergent patterns of relationships can be reconciled by considering the moderating role of sociocultural contexts in which anger is experienced and expressed. First, we begin with a review of the current literature linking anger expression to health, largely based on Western populations. Second, we discuss our theoretical framework developed to understand how culture might shape different functions of anger expression and anger's relationship with health. Third, we discuss two lines of research based on culturally matched surveys of Americans and Japanese that provide initial evidence for this theoretical formulation. Finally, we conclude by suggesting future research directions.

Anger Expression and Health: Evidence From Western Populations

Contemporary research on the relationship between anger expression and health stems from early investigations to identify health correlates of Type A behavior. The Type A behavior pattern is a multifaceted construct characterized by a range of traits, including competitive drive, intense ambition, hostility, and impulsivity, that were thought to be a serious risk factor for coronary heart disease (Siegman, 1994). Although there is no clear empirical evidence that this temperament is causally involved in the development of coronary heart disease (Brotman, Golden, & Wittstein, 2007; Everson-Rose & Lewis, 2005; Myrtek, 2001), evidence is stronger for anger and hostility, one of the key components of Type A behavior. In the current review, we focus on three types of compromised health conditions associated with higher levels of anger expression and hostility: (a) pain severity and dysfunction, (b) pro-inflammatory processes, and (c) cardiovascular diseases.

Much evidence has accumulated on the role of anger and hostility in chronic pain. For example, Duckro, Chibnall, and Tomazic (1995) examined the relationship between anger expression and headache-related

disability among individuals with chronic post-traumatic headache. Consistent with the view that greater anger is associated with exacerbation of pain and disability (Fernandez & Turk, 1995), higher anger expression was linked to greater perception of disability, the effect of which was mediated by increased feelings of depression. Similarly, evidence suggests that anger and hostility are significant predictors of pain symptom severity (Gaskin, Greene, Robinson, & Geisser, 1992; Summers, Rapoff, Varghese, Porter, & Palmer, 1991), as well as emotional distress among patients with chronic pain (Kinder, Curtiss, & Kalichman, 1992; Wade, Price, Hamer, Schwartz, & Hart, 1990). Moreover, Burns (1997) showed that anger-induced social stress produced greater muscle tension among patients with chronic low back pain, which in turn led to greater perceptions of pain severity. This finding suggests that physiological arousal indexed by muscle tension may be one of the mediating pathways through which anger exacerbates pain.

Another line of research suggests that inflammation is a more chronic pathway that mediates the effects of anger and hostility on pain as well as other chronic health conditions (Graham et al., 2006; Watkins, Maier, & Goehler, 1995). For example, Sjogren, Leanderson, Kristenson, and Ernerudh (2006) showed that higher levels of trait hostility were associated with increased interleukin-6 (IL-6), one of the key pro-inflammatory cytokines involved in various immune processes. Suarez (2004) similarly found that greater anger and hostility were significantly associated with elevations in C-reactive protein (CRP), another pro-inflammatory cytokine stimulated primarily by IL-6 (Heinrich, Castell, & Andus, 1990). These findings were replicated in a large population-based study conducted in the United States. Ranjit and colleagues (2007) examined cynical distrust as a proxy of hostility and found that higher levels of cynical distrust were linked to increased levels of IL-6 and CRP among 6,814 middle-aged and older adults (45–84 years). Marsland, Prather, Petersen, Cohen, and Manuck (2008) further showed that anger/hostility predicted increased pro-
p. 381 inflammatory responses ↳ even after controlling for the effects of trait negative emotionality.

Growing evidence also suggests that anger and hostility are linked to other biomarkers that are thought to causally stimulate pro-inflammatory cytokines (Janicki-Deverts, Cohen, & Doyle, 2010; Suarez, Lewis, & Kuhn, 2002). For example, trait hostility has been linked to increased lipopolysaccharide (LPS). LPS is known to stimulate tumor necrosis factor (TNF)-α production in vitro (Suarez et al., 2002), which in turn triggers the production of IL-6 and CRP (Pang, Couch, Batey, Clancy, & Cripps, 1994).

Consistent with the findings that chronic elevation of pro-inflammatory responses plays a critical role in the etiology and pathogenesis of numerous age-related health problems, including cardiovascular malfunction (Black, 2003; Everson-Rose & Lewis, 2005; Ridker, Hennekens, Buring, & Rifai, 2000), anger expression and hostility have also been shown to predict increased risks for cardiovascular diseases (Suls & Bunde, 2005), including higher systolic blood pressure and higher prevalence of incident hypertension (Harburg, Gleiberman, Russell, & Cooper, 1991; Laude, Girard, Consoli, Mounier-Vehier, & Elghozi, 1997). Similarly, evidence suggests that expression of anger or hostility predicts high prevalence and severity of atherosclerosis, a key component of coronary artery disease (Julkunen, Salonen, Kaplan, Chesney, & Salonen, 1994; Matsumoto et al., 1993).

In addition to the cross-sectional findings we reviewed above, several longitudinal studies provided evidence for the prospective relationships between anger expression or hostility and compromised health over time (see Chida & Steptoe, 2009, for a review). One prospective study showed that trait hostility predicted increased levels of CRP over a 6-year span among older adults (Graham et al., 2006). Similarly, a recent study conducted in Finland (Elovainio et al., 2011) documented positive associations between hostility and increased risk of metabolic syndrome and higher levels of CRP 9 years later, although this effect was more pronounced for women than men. Another study conducted in Finland (Everson, Goldberg, Kaplan, Julkunen, & Salonen, 1998) similarly found that men self-reportedly expressing more anger were at a two-fold higher risk of developing hypertension after 4 years compared to those who expressed anger less. Moreover, expressed anger also predicted an increased risk of stroke approximately 8 years later (Everson et al., 1999).

Experimental studies provide additional support for the causal impact of anger expression on health. For example, acute stress over anger-inducing events preceded coronary events (Strike, Perkins-Porras, Whitehead, McEwan, & Steptoe, 2006). Moreover, individuals who showed angry reactions following an acute stress task (i.e., public speech task) showed increases in IL-6 at 30 minutes after the task (J. E. Carroll et al., 2011).

Despite the systematic evidence on the health-compromising effects of anger and hostility in the prior literature, currently missing is a consideration of the broader sociocultural contexts in which anger is experienced and expressed. Much of the prior literature is primarily based on Western populations, such as European Americans (e.g., Graham et al., 2006; Marsland et al., 2008) and Northern Europeans (e.g., Elovainio et al., 2011; Everson et al., 1998). Only a paucity of studies examined populations outside Western cultures and societies. Importantly, the results from these investigations challenge the generalizability of the earlier findings to non-Western populations. For example, one study examined intercellular adhesion molecule-1 (ICAM-1), a marker of cellular adhesion that stimulates pro-inflammatory signaling related to cardiovascular disease risk (Hajilooi, Sanati, Ahmadieh, Ghofraniha, & Massoud, 2003; Shai et al., 2006), and found no significant association between anger and this biomarker among Latino Americans (Shivpuri et al., 2011).

More surprisingly, some recent findings suggest that anger is associated with *salubrious* health effects for certain non-Western ethnic or cultural groups (Consedine et al., 2005, 2006; Kitayama et al., 2015). For example, Consedine and colleagues (2005) examined the relationships between trait anger and self-reported health among six ethnic groups (i.e., U.S-born African American, English Caribbean, Haitian, Dominican, Eastern European, and US-born European American) and found that greater anger was linked to better health in all minority groups. In contrast, for US-born European Americans, anger was associated with poor health, as in the previous work reviewed.

How can these apparently contradictory findings be reconciled? In what follows, we argue that the emotion of anger is not a monolithic entity, but it rather entails a complex, multifaceted experience that may have different functions across sociocultural environments (Averill, 1982; Fischer & Roseman, 2007; Kassam & Mendes, 2013; Kitayama et al., 2015; Park et al., 2013). We highlight two such ↳ functions of anger: serving to vent frustrations or display dominance. We then argue that depending on which function predominates in a given cultural context, anger expression could be a health risk or benefit.

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Two Forms of Anger Expression: Anger as Vented Frustration Versus Dominance Display

> *The burning buildings, smashed police cars and scuffles between police officers and angry protesters on Milwaukee's north side over the weekend might have seemed like a spontaneous eruption. But for many in the city's marginalized black community, it was an explosive release decades in the making.*
>
> *Eligon, 2016*

> *The "nut rage" drama has captivated South Korea with tales of outrageous behavior followed by public apologies from the executive and her father, the airline's Chairman. Cho Hyun-ah, who has since resigned as head of cabin service at Korean Air, was angered when a flight attendant in first class offered her macadamia nuts in a bag, not on a plate. She ordered him off the plane and forced the flight to return to the gate at John F. Kennedy airport in New York City.*
>
> *Lee, 2014*

As reviewed in the preceding section, the prior literature linking anger expression to compromised health is consistent with the negative conceptualization of anger as harmful, disruptive, and unhealthy. However, increasing evidence suggests that anger expression can often provide adaptive functions (Averill, 1982; Fischer & Roseman, 2007; Kassam & Mendes, 2013; van Doorn & Zeelenberg, 2014). Building on this evidence, we propose an alternative conceptualization of anger as a multifaceted experience that may serve different functions across cultures. The theory developed in this chapter focuses on two primary functions of anger: anger as vented frustration and anger as dominance display.

First, it is commonly understood that anger arises when certain values and goals are infringed on. This emotion may arise out of a frustration caused by perceived injustice and unwarranted interference with one's goals and welfare. Its function may be to address the impinging problem and to reduce the frustration. This form of anger—called anger as vented frustration—is well illustrated in the first of the two quotations at the start of this section. This quotation describes a racial riot in Milwaukee, Wisconsin, in 2016, which was sparked by the death of a 23-year-old African American man in a police shooting. In this example, the riot is seen as a collective expression of long-held frustrations over inequality and poverty among African Americans in Milwaukee, one of the most racially segregated cities in the United States (Tolan & Glauber, 2010). This example illustrates the form of anger as vented frustration, as the violence was motivated by perceived inequality, poverty, and racial discrimination, all of which posed a significant threat to African Americans in that area.

This model of anger is consistent with the frustration–aggression hypothesis (Dollard, Doob, Miller, Mowrer, & Sears, 1939), which holds that frustration plays an integral role in eliciting aggressive behaviors. According to this hypothesis, when goal-directed activities are blocked, feelings of frustration arise; these in turn culminate in anger expression or aggression (but see also Berkowitz, 1989; Dill & Anderson, 1995, for some modifications to the original hypothesis). In support of this hypothesis, one early study demonstrated that an experimental manipulation to induce feelings of frustration (e.g., failure on a task) increased subsequent expressions of anger among college students (Buss, 1963). It has also been suggested that feelings of frustration stemming from thwarted goal-directed action is an unlearned cause of anger because even 2- to 8-month-old infants exhibit angry facial expressions following an experience of frustration (Lewis, Alessandri, & Sullivan, 1990).

Although anger as vented frustration is common and is the mainstay of anger theories in psychology, it is not the only type of anger that is prevalent and consequential. Our theoretical formulation of anger points to another potent subtype of anger that we call here anger as dominance display. This model of anger primarily serves as a display of power and privilege, intended to threaten others and demonstrate who is above and who is below in the hierarchical relationship. This form of anger is well illustrated in the second of the two opening quotations. The quotation describes a "nut rage" incident that took place at John F. Kennedy Airport in New York in 2014, when the vice president of Korean Airline (the daughter of the chairman of the airline) ordered the aircraft to taxi back to the gate to offload a flight attendant who had served the nuts, not on a plate, but in a bag. The angry outburst like this, typically directed toward one's subordinate, represents
p. 383 the form of anger expression wherein the ↳ dominating behaviors are highlighted more as a display of high social ranking and status than its frustration component.

This model of anger is consistent with growing evidence from both etiology (Hurd & Enquist, 2001) and social psychology (Tiedens, 2001) that anger expression can serve as a means to intimidate others and display power and status. For example, when semantic associations of anger are examined, anger has a strong connotation of dominance, which is pitted against submissive emotions such as shyness, compassion, and sympathy (Conway, DiFazio, & Mayman, 1999). Moreover, facial expressions of anger are perceived as signaling dominance, status, and competence (Clark, Pataki, & Carver, 1996; Knutson, 1996; Labott, Martin, Eason, & Berkey, 1991), such that the same person is perceived both as more dominant and as being high in social status if he or she expresses anger compared to other negative emotions, such as

sadness (Hareli, Shomrat, & Hess, 2009; Tiedens, Ellsworth, & Mesquita, 2000). Similarly, appraisal theories of emotion suggest that power potential is a critical element of anger (e.g., Frijda, 1986; Scherer, 1999). As may be expected from its close link to dominance, power, and status, people often use anger expression as an intimidation strategy (Clark et al., 1996; Jones & Pittman, 1982). Taken together, this body of work suggests that anger is often used to signal dominance and status.

These two forms of anger may be common and quite prevalent across different cultures and societies and thus may have universal features. Indeed, if the emotion of anger evolved to motivate individuals to cope with frustrating circumstances and then convert them into one in which one can feel in charge, the two forms of anger may best be seen as two distinct aspects that are inherently intertwined (e.g., Darwin, 1872/1965; Ekman & Friesen, 1975; Plutchik, 1980; Young, 1943). Nevertheless, we propose that the experience of anger can vary dramatically depending on which of the two key components (frustration or dominance) is highlighted in a given situation. Specifically, the two forms of anger may be differentially available and made salient depending on a variety of environmental factors, including national culture. In particular, in cultures where the vented frustration function of anger is more elaborated than its dominance display function, anger expression may be linked to compromised health because those who express anger often are likely to be precisely the ones who are chronically exposed to frustration-inducing life difficulties, such as lower social rank, poverty, perceived inequality, and discrimination. In contrast, in cultures where the dominance display function of anger is elaborated while its frustration component is considered secondary, anger expression could be linked to better health. The reason is that those who express anger often in these contexts are likely to be the ones who are chronically exposed to more favorable social conditions that entail greater access to social and economic privileges.

This analysis then suggests that the frequency by which people routinely express anger may serve as an index of one of the two contrasting sets of life conditions characterizing these individuals: chronic exposure to frustration-inducing life difficulties (as in the racial riot example) or persistently greater access to economic and symbolic resources (as in the nut rage example). It would follow then that anger expression should be associated with different health outcomes, depending on which form of anger is prominent in a given sociocultural context. Next, we review two lines of research that provided initial support for this hypothesis by focusing on national culture as a key sociocultural moderator of anger expression, using culturally matched surveys of American and Japanese adults. First, we discuss the role that culture plays in modulating the relationship between anger expression and social status, depending on the relative significance of two functions of anger in a given cultural context. Second, we discuss health implications of the two models of anger by testing the relationship between anger expression and biological dysregulation between two cultural groups.

Anger Expression and Social Status: Cultural Context as a Moderator

The primary assumption of our theory is that the relative salience of two disparate functions of anger—serving to vent frustration or display dominance—varies widely across cultures. Culture is composed of socially shared meanings, such as ideas and beliefs, and associated behavioral patterns, such as practices and conventions (Kitayama, Markus, Matsumoto, & Norasakkunit, 1997; Markus & Kitayama, 2010; Morling & Lamoreaux, 2008). These meanings, practices, and conventions may highlight one model of anger in lieu of the other, such that whereas the model of anger as vented frustration is more salient in Western cultural contexts, the model of anger as dominance display is more salient in Eastern cultures.

p. 384 It has been proposed that Western and Eastern cultures vary in the degree to which independence or interdependence is normatively sanctioned (Kitayama & Uskul, 2011; Markus & Kitayama, 1991, 2010). In Western cultures, including US society, there is a strong belief of the self as independent. The self is defined

primarily by its internal attributes, such as desires and goals, and therefore, individuals in these cultures show a strong commitment to their personal goals. Thus, these goals are held to be highly self-defining. Indeed, the pursuit of personal goals is one of the key elements of culturally scripted tasks of independence (Kitayama, Park, Sevincer, Karasawa, & Uskul, 2009). As a consequence, when individuals are confronted with certain constraints that interfere with their goal pursuit, this may entail strong feelings of frustration. These feelings in turn may motivate the experience of anger as well as its expression.

In contrast, Eastern cultures, such as the Japanese society, tend to emphasize a contrasting view of the self as interdependent; therefore, individuals in these cultures show a strong commitment to the belongingness to their groups. Being part of an important group or relationship is primary and self-defining insofar as it is one of the key elements of culturally scripted tasks of interdependence (Kitayama et al., 2009). Moreover, because of the strong emphasis placed on social hierarchy in Eastern cultures (Hofstede, 1980), one's place or relative standing in the respective group is also highly self-defining.

We propose that in such hierarchical, interdependent societies, the dominance display function of anger may be more salient as only those who are sufficiently high in the hierarchy are allowed to display anger. Due to the relationship-disrupting effects of anger, there is a general cultural prescription against anger expression in Eastern cultures. However, individuals in positions of power may be given a cultural permit or authorization to express anger, called "anger privilege" (Taylor & Risman, 2006), as high power or status liberates people to freely express emotions or ideas without fear of negative future consequences (Anderson & Berdahl, 2002; Hall, Rosip, LeBeau, Horgan, & Carter, 2006). It would then follow that anger expression in these cultures may serve as an effective form of communication to signal dominance, a phenomenon largely restricted to only a limited number of people who are in positions of high status.

As one critical test of this prediction, we examined the extent to which individuals with high versus low social status would express anger in Western and Eastern cultures. In Western cultures where the frustration component of anger is prominent, anger should be expressed more by those with lower social status insofar as they find it harder to achieve their goals and desires because of the relative lack of resources (Markus, Ryff, Curhan, & Palmersheim, 2004). In contrast, in Eastern cultural contexts where the dominance aspect of anger is prominent, anger should be expressed more by those higher in social status as anger expression may only be allowed among those in positions of power.

Currently, evidence is available for the prediction for Western cultures. Individuals with lower socioeconomic positions are more likely to show aggressive and delinquent behaviors (Brownfield, 1986; Elliot & Ageton, 1980), express anger or hostility more often (Barefoot et al., 1991; Henry, 2009), and commit violent crimes such as homicide more (Blau & Blau, 1982; Crutchfield, 1989) compared to their higher status counterparts. The racial violence example illustrated in the opening quotation of the preceding section is also consistent with this literature as it was the marginalized groups of African Americans in Milwaukee who instigated the riots. However, all these studies were conducted in Western societies and cultures; therefore, it remains to be seen whether the link between social status and anger expression might be reversed in Eastern cultural contexts.

In our recent work, we compared 1,054 Americans and 1,027 Japanese from two culturally matched surveys, called Midlife in the United States (MIDUS) and Midlife in Japan (MIDJA) (Park et al., 2013). American respondents were a subset of the MIDUS survey who completed a second-wave survey in 2004 (MIDUS 2) and participated in an additional overnight session for biomarker assessments. The Japanese data were collected from a parallel survey conducted in Japan in 2008 based on randomly selected samples of Japanese from the Tokyo metropolitan area. For both cultural groups, anger expression was assessed with the eight-item anger-out subscale of the Anger Expression Inventory (Spielberger, 1996), one of the most widely used measures of anger expression (e.g., Eng, Fitzmaurice, Kubzansky, Rimm, & Kawachi, 2003; Engebretson, Matthews, & Scheier, 1989; Everson et al., 1998; Kerns, Rosenberg, & Jacob, 1994; Kitayama et al., 2015).

Respondents rated how often (1 = *almost never*, 4 = *almost always*) they expressed angry feelings through verbally or physically aggressive behaviors when they feel furious and angry (e.g., I slam doors; I strike out
p. 385 at what ↳ infuriates me). A confirmatory factor analysis established measurement equivalence of this construct between the two cultural groups (Park et al., 2013).

We assessed two forms of social status: objective and subjective. We first followed previous work (e.g., Ritsher, Warner, Johnson, & Dohrenwend, 2001) and used both educational attainment and occupational prestige to yield an indicator of objective social status. These social class markers are considered *objective* because they are consensual and socially verifiable. These objective social status markers are quite significant in predicting a variety of outcome variables, including health, mortality, and well-being. Moreover, there is reason to believe that they may be even more important in collectivistic societies where the self is defined more consensually by socially shared appraisals (D. Cohen, Hoshino-Brown, & Leung, 2007; see also Curhan et al., 2014).

Second, we also assessed social status *subjectively*. Recent work suggests that above and beyond one's objective social standing, a subjective assessment of the self's relative rank has additional effects (Adler, Epel, Castellazzo, & Ickovics, 2000; S. Cohen et al., 2008; Demakakos, Nazroo, Breeze, & Marmot, 2008). As in numerous prior studies, subjective social status was assessed by asking participants to indicate their standing in their own community by checking a location on a vertical ladder (Goodman et al., 2001). We anticipated that the subjective aspect of social status may be relatively more important in individualistic societies in which the self is defined primarily by subjective and personally idiosyncratic (as opposed to public and socially shared) appraisals (D. Cohen et al., 2007; Curhan et al., 2014).

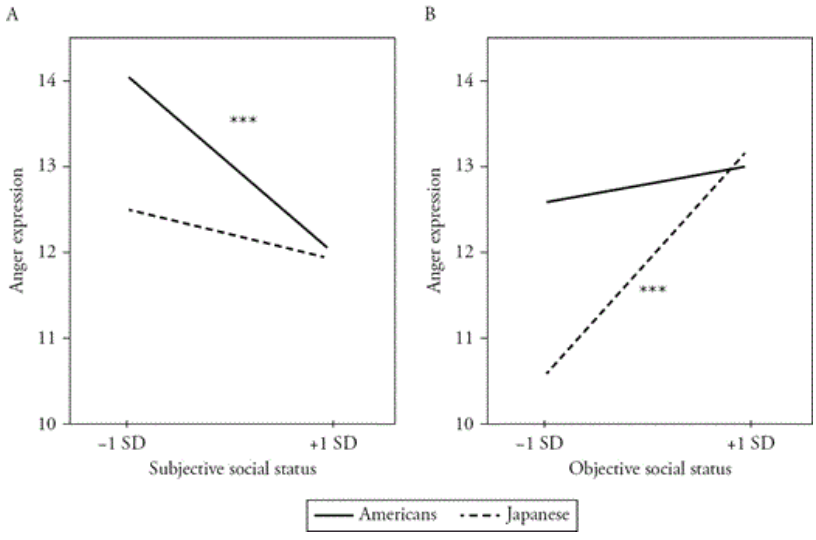

Figure 28.1 The relationships between anger expression and social status (A, subjective; B, objective) for Americans (solid line) and Japanese (dotted line). *SE* = standard error. ***$p < .001$.

Adapted from Park et al., 2013, *Emotion*.

Three findings stood out for Americans (Park et al., 2013). First, Americans with lower social status expressed more anger compared to their higher status counterparts (Figure 28.1A). This pattern is consistent with the hypothesis that American culture highlights the model of anger as vented frustration, and as a consequence, those expressive of anger tend to be the ones who are chronically exposed to frustrating life difficulties. Second, among the American sample, it was the subjective (ladder) measure of social status that was predictive of anger expression. There was no effect of objective social status. This result supports the notion that for Americans, subjective and more personal appraisals of the self are weighed more than their objective, socially shared counterparts. A third notable finding concerns the

mediating mechanism. Remember we predicted a negative relationship between subjective social status and anger expression among Americans because Americans with lower social standing are likely to experience more frustrations in life, which in turn motivate them to express anger more. This implies a mediational
p. 386 effect of frustration on the negative relationship between social status and ↳ anger expression (i.e., lower subjective social status ➔ greater feelings of frustration ➔ more frequent expression of anger). To test this mediation model, we assessed the experience of frustration based on a one-item self-report measure of how much frustration participants felt during the past 30 days. The subsequent mediation analysis showed, as predicted, that the negative link between anger expression and subjective social status was mediated by the feelings of frustration.

Corresponding results for Japanese were equally striking (Park et al., 2013). First, we found an opposite pattern of the relationship between social status and anger expression: Anger expression was higher for high- (vs. low-) status individuals, consistent with the hypothesis that high social status confers a cultural permit or authorization to express anger in Asian cultures (Figure 28.1B). Second, as predicted by the notion that objective status markers are much more important than subjective markers for Japanese, this effect was observed for the objective rather than the subjective measure of social status. Third, we reasoned that high-status Japanese express anger more because only those who are sufficiently high in hierarchy have a cultural privilege to express anger. This implies a mediational role of dominance in the positive relationship between social status and anger expression (i.e., higher objective social status ➔ greater experience of dominance ➔ more frequent expression of anger). We assessed the extent to which participants felt they had decision authority at work (Bosma & Marmot, 1997) as a proxy of anger privilege. As predicted, self-reported ratings of decision authority Japanese have at work significantly mediated the positive relationship between objective social status and anger expression.

Anger Expression, Culture, and Biological Dysregulation

So far, we have argued that the same emotion, anger, is construed differently between Western and Eastern cultures. One important corollary of this analysis is that anger expression may entail different health consequences across cultures, depending on which aspect of anger (vented frustration or dominance display) is culturally sanctioned. Our analysis builds on the hypothesis that in some cultures (e.g., Western cultures), anger is construed primarily as vented frustration. It would follow that, in these cultures, expression of anger is an index of chronic exposure to frustration-inducing life difficulties. As documented previously, the current literature is consistent with this prediction by showing that the expression of anger or hostility is associated with a variety of adverse health outcomes, including increased risks for coronary heart disease (Chida & Steptoe, 2009), pro-inflammatory processes (Elovainio et al., 2011; Graham et al., 2006; Marsland et al., 2008), and general chronic pain severity or dysfunction (Bruehl, Chung, & Burns, 2006). In contrast, in some other cultures (e.g., Eastern cultures), anger is construed primarily as dominance display. It would follow that in these cultures, expression of anger is an index of life privileges that accord dominance, power, and entitlement. Thus, anger expression could be associated with better health.

Our recent study tested this prediction by comparing 1,027 Americans and 382 Japanese from the biomarker samples of MIDUS and MIDJA (Kitayama et al., 2015). The American sample was a subset of MIDUS 2 participants who traveled to one of three general clinical research centers (Madison, WI; Washington, DC; Los Angeles, CA) for the assessments of biological variables. The Japanese data were obtained from a subset of MIDJA participants who traveled to a medical clinic near the University of Tokyo for the biomarker assessments. We used the same anger expression variable used in our previous analysis (Park et al., 2013) as a predictor of biological health risk for both cultural groups.

Building on prior evidence that greater expression of anger is associated with greater biological dysregulation indexed by pro-inflammatory responses (Elovainio et al., 2011; Graham et al., 2006; Marsland et al., 2008), we examined two indices of inflammation (IL-6 and CRP) as one type of biological dysregulation. Growing evidence also suggests that pro-inflammatory processes gradually compromise cardiovascular functions when sustained over a long time and thus eventually elevate risk for morbidity and mortality (Everson-Rose & Lewis, 2005; Medzhitov, 2008). We thus also assessed cardiovascular risk with two biomarkers: systolic blood pressure and the ratio of total to high-density lipoprotein (HDL) cholesterol. Consistent with the evidence that inflammation is a major risk for cardiovascular disease, the four biomarkers were positively correlated for both cultural groups. Moreover, a principal component analysis showed that all four biomarkers loaded on a single factor, suggesting that they coherently represent biological dysregulation for both cultural groups. We thus used the factor score from this analysis as an
p. 387 index of biological health risk. ↳

The analysis of this variable revealed a striking cultural difference in the association between anger expression and biological health risk. Consistent with numerous findings linking anger expression to ill health, anger expression was associated with *increased* biological health risk among Americans. Notably, this relationship remained significant after controlling for a variety of confounding variables that could influence anger expression or biological health risk, including demographic variables (age, gender, social status), health conditions (chronic health problems, waist-to-hip ratio), and health behaviors (smoking, alcohol consumption). In stark contrast, this relationship was completely reversed for Japanese with the same set of variables as covariates. For these individuals, anger expression was linked to *reduced* biological health risk (Figure 28.2).

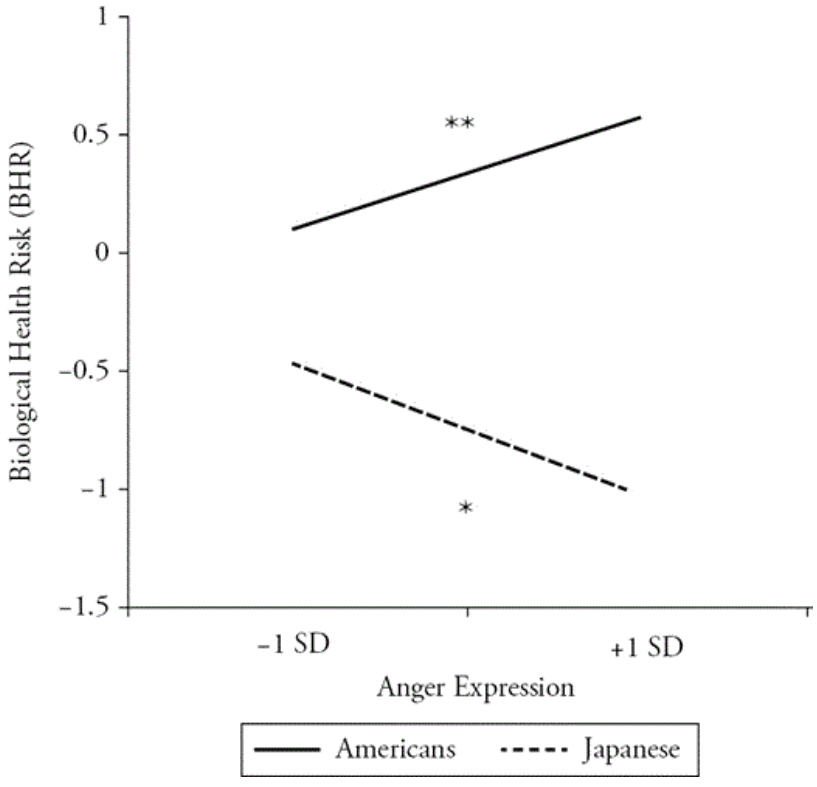

Figure 28.2 The relationships between anger expression and biological health risk (BHR) for Americans (solid line) and Japanese (dotted line). *SE* = standard error. *$p < .05$, **$p < .01$.

Adapted from Kitayama et al., 2015, *Psychological Science*.

To account for this cultural difference, we have hypothesized that anger expression will be linked to different health consequences depending on whether it serves as an index of an expresser's chronic exposure to frustration-inducing life vulnerabilities or greater accessibility to social and economic privileges that enable him or her to be dominant. As indicated by our previous analysis (Park et al., 2013), social status is likely one of the most powerful life conditions causing experiences of frustrations (as in the racial riot example) or dominance and power (as in the nut rage incident). Yet, it is noteworthy that the current evidence of the cultural moderation remained significant even after the effects of both objective and subjective social status were partialed out. This analysis then suggests that anger expression is a complex phenomenon that may reflect potentially many social conditions (other than social status per se) that can contribute to either experiences of frustration (as in the United States) or power and dominance (as in Japan).

Interestingly, using the same dataset of MIDUS and MIDJA, Miyamoto et al. (2013) examined IL-6, a single biomarker of inflammation that constitutes our index of biological health risk, and found that negative affect was linked to increased IL-6 among Americans, but not among Japanese (see Chapter 27, this volume). In light of this analysis, one might argue that the results from our analysis are confounded by the cultural difference documented on the link between negative affect and health. However, one notable difference between the two studies is that anger expression was associated with *reduced* biological health risk among Japanese in Kitayama et al. (2015), whereas negative affect did not provide such a salubrious health effect among the same individuals in Miyamoto et al. (2013). Moreover, the evidence of cultural modulation in the link between anger expression and biological health risk was obtained after additionally controlling for negative affect, thereby suggesting that negative affect does not account for the cultural difference observed in the anger expression–health link.

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Future Directions

In her book, *Anger: The Misunderstood Emotion*, Carol Tavris noted, "Anger is good or bad depending on its use, not its nature" (1989, p. 259). Consistent with this view supporting the multifaceted functions of anger, the findings we reviewed in this chapter suggest that the extent to which anger expression is associated with better or worse health depends on sociocultural conditions, such as national culture, as these conditions are likely to determine which function of anger predominates in a given environmental context.

In this chapter, we focused on two primary functions of anger (serving to vent frustration or display dominance) and discussed two lines of research based on the MIDUS/MIDJA surveys that provide initial evidence for our theoretical formulation. We first showed that two cultural groups show diametrically opposite relationships between social status and anger expression, depending on which of the two functions is culturally sanctioned (Park et al., 2013). We then discussed health implications of the two models of anger by showing that the relationship between anger expression and health also depended on culture such that anger is linked to poor health among Americans, whereas it is associated with improved health among Japanese (Kitayama et al., 2015).

We see many promising lines of inquiry for future research. First, our model and supporting empirical data are agnostic about the causal relationship between anger expression and health. One possibility might be that the two forms of anger, if used repeatedly over a long period of time, may gradually exacerbate or improve health conditions. For example, if anger is primarily used as a means to vent frustration, this form of anger may be perceived and experienced as a threat. The perceived threat may then activate epigenetic pathways that produce inflammation and also exacerbate cardiovascular conditions (Irwin & Cole, 2011). In contrast, if anger is primarily used as a means to display dominance, this form of anger may be experienced as empowering. The enhanced sense of empowerment could downregulate the pro-inflammatory processes

and lower cardiovascular risk. Importantly, in order for the long-term health effects of anger to occur, both the perceived threat and the sense of empowerment must be reinforced and sustained by the external conditions that initially gave rise to anger expression, namely, frustrating experiences (as in the United States) and social privileges (as in Japan), respectively. This possibility must be tested in future work with a longitudinal design. Subsequent work utilizing the longitudinal data (forthcoming for both MIDUS and MIDJA) may begin to illuminate how anger expression might bring about these divergent health effects.

Another way to address the causal relation between anger expression and health is to examine physiological stress responses as a potential mediating mechanism. It has been suggested that cardiovascular and neuroendocrine stress reactivity and recovery patterns may explain how affective responses are transduced into biochemical signals that impact physical health (DeSteno, Gross, & Kubzansky, 2013). Specifically, increasing evidence suggests that physiological reactivity to acute stressors, based on autonomic and neuroendocrine responses, may predict cardiovascular biomarkers and disease risks (e.g., Aschbacher et al., 2008, 2013; D. Carroll, Lovallo, & Phillips, 2009). Accordingly, examination of physiological stress responses may illuminate the process through which anger expression confers benefit or risk to physical health. Future research should test this idea by examining whether anger expression is linked to maladaptive physiologic stress responses (e.g., elevated stress reactivity and slower recovery) among Americans, whereas it is linked to more positive physiologic profiles among Japanese.

It is important to recognize that we focused exclusively on two components of anger (frustration and dominance). Future research should explore other functions of anger that do not fit in this prototype to understand their health implications. For example, it has been proposed that if one expresses anger constructively in a way to improve the situation, this may provide health-protective effects (Gidron, Davidson, & Bata, 1999; Stoney & Engebretson, 2000). In support of this hypothesis, one study found that the constructive verbal behavior of anger was negatively linked to resting blood pressure among Western samples (Davidson, MacGregor, Stuhr, Dixon, & MacLean, 2000). One future extension will be to examine whether this finding is generalizable in Asian cultures where discussion of anger is generally discouraged.

Finally, our work focused on national culture as a critical moderator of the functionality of anger. Yet, national culture is one of many social conditions that can influence the anger expression–health link. Recently, some studies tested social status as another moderating contextual variable and found that the
p. 389 health-damaging effects of anger expression tended to be more strongly pronounced for socially ↳ disadvantaged individuals, such as those with low educational attainment (Boylan & Ryff, 2013) and low childhood socioeconomic status (Beatty & Matthews, 2009). These findings are consistent with our formulation that anger will be a greater health risk especially for individuals who are chronically exposed to life adversities and challenges (e.g., low social status), which in turn lead them to use anger more as a means to vent frustrations. Future research should extend this analysis by examining how other forms of cultural environments influence the anger expression–health link either independently or in tandem with other social conditions. Taken together, this increasing body of work along with our analyses underscore the importance of examining cultural sanctioning of different aspects of anger expression in understanding its social, psychological, and health correlates.

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