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A stress and coping perspective on health behaviors: theoretical and methodological considerations

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Health behaviors such as eating and exercising have been linked to stress in many studies, and researchers suggest that these links are in large part due to the use of health behaviors to cope with stress. However, health behaviors in the context of coping have received relatively little research attention. In this paper, we briefly survey the literature linking stress, coping, and health behaviors, noting that very little research has explicitly examined health behaviors as coping with stress. We address critical theoretical and methodological issues that arise in applying a stress and coping perspective to health behaviors. We conclude with potential directions for interventions, including the need for conceptually solid and methodologically rigorous research and the development of new measures, and with suggestions for future research. The concepts of self-regulation and stress management and their implications in health behavior research and interventions are also discussed.

Keywords: stress; coping; health behaviors; diet; exercise

Health behaviors such as eating and exercising are a critical aspect of health and well-being; they are closely linked to mental and physical functioning and morbidity and mortality. Unfortunately, for many people, health behaviors are suboptimal (Gordon, Lavoie, Arsenault, Ditto, & Bacon, 2008; Hughes, Hannon, Harris, & Patrick, 2010). One prime but often overlooked reason that people may engage in poor health behaviors is that they use these health behaviors to help them cope with stress. Relatively little research has examined the links between stress, coping, and health behaviors, yet this perspective may be a critically important one for understanding the persistence of poor health behaviors in spite of their negative long-term effects and in spite of the many interventions targeted at changing them. Understanding health behaviors in the context of stress and coping may provide fruitful new avenues for targeted interventions.

In this paper, we briefly survey research linking stress, coping, and health behaviors, focusing first on studies relating stress and health behaviors (often with an underlying assumption that the health behaviors serve as coping, but without actually testing this assumption) and then those studies that explicitly examined health behaviors as efforts to cope with stress. We then highlight conceptual and methodological challenges that arise when applying a stress and coping perspective to health behaviors. We conclude with suggestions for future research and interventions.

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Health behavior

Health behavior has been variously defined as “action taken by an individual or group of individuals to change or maintain their health status or prevent illness or injury” (Centers for Disease Control and Prevention, 2011) or as any behavior that involves health as a consequence, not necessarily as a primary goal (Ingledeew, Hardy, Cooper, & Jemal, 1996). Researchers typically operationally define “health behaviors” as observable behaviors such as exercise, drinking (e.g., alcohol, caffeinated beverages, sugary drinks), eating (e.g., caloric intake, consumption of dense comfort foods, fat intake, fruit and vegetable consumption), and tobacco use (e.g., cigarette smoking, chew tobacco usage). Less commonly studied health behaviors include oral health (e.g., Ylöstalo, Ek, Laitinen, & Knuuttila, 2003), sleep hygiene (e.g., Brown, Buboltz, & Soper, 2002), and driving (e.g., seatbelt use, speeding) (e.g., L’heureux, 2012; Schlundt, Briggs, Miller, Arthur, & Goldzweig, 2007).

Research that improves our understanding of health behaviors could greatly benefit public health, given the high levels of poor health behaviors in the United States and around the world. A survey of nearly 80,000 American adults found that only 3 in 10 exercise regularly, 1 in 5 smoke, and 6 in 10 are overweight or obese (Schoenborn & Adams, 2010). The World Health Organization (WHO, 2005) estimates that by 2015, 1.5 billion people worldwide will be overweight, mostly due to unhealthy food consumption and overeating. If such trends continue, it is projected that there will be 2.6 billion overweight and 1.12 billion obese individuals worldwide by 2030 (Kelly, Yang, Chen, Reynolds, & He, 2008).

However, many efforts to improve health behaviors are being made on individual and collective levels. For example, in the United States, the federal government has many programs promoting healthier diet and exercise behaviors (e.g., Fuhrel-Forbis, Nadorff, & Snyder, 2009; Snyder, 2007). In addition, hundreds of interventions have been developed and implemented aiming to improve diet and exercise for the general population or for specific groups such as those with chronic illness or at high risk of particular disease (e.g., McCarthy, Yancey, Harrison, Leslie, & Siegel, 2007; Miller, Edwards, Kissling, & Sanville, 2002; Sørensen, Anderssen, Hjermerman, Holme, & Ursin, 1997; see Johnson, Scott-Sheldon, & Carey, 2010, for a review).

Studies linking stress and health behaviors

Researchers have long examined links between stress and diet, exercise, and other health behaviors (e.g., Berger & Owen, 1988; Salmon, 2001; Wardle, Steptoe, Oliver, & Lipsey, 2000). This research is typically based on the premise that people’s health behaviors are, in large part, affected by their stress levels because they use the health behaviors to cope with or manage the distress they experience arising from the stress. However, the bulk of this work has examined the stress–health behavior links without explicitly assessing coping; we provide an overview of this work in this section. In the following section, we review the much smaller body of work that has explicitly examined health behaviors as coping with stress. In reviewing this literature, it is important to keep in mind that these studies only demonstrate correlations between stress and behaviors; while findings are generally consistent with the notion that stress causes enactment of certain health behaviors, it is plausible that the direction runs the other way (e.g., exercise creates resources that reduce stressful encounters [see MacFarlane & Montgomery, 2010]). It

may also be that unmeasured third variables account for both health behaviors and stress. Because of the correlational nature of the findings, causal inferences cannot be drawn.

Research has demonstrated that chronic stress is linked with a variety of health behaviors. One study of a nationally representative sample of US residents that examined links between daily stress levels and health behaviors found that the more socioeconomic stress (SES) participants reported, the more likely they were to engage in negative health behaviors (Krueger & Chang, 2008). This study did *not* specifically ask whether smoking, drinking, or sedentary behaviors were used *as* coping, but the results indicated a positive correlation between high stress levels and more alcohol consumption and cigarette smoking, while physical activity was inversely related to stress. Similarly, a cross-sectional study of 12,110 individuals in 26 worksites found that work stress was associated with poorer health behaviors, including higher levels of smoking, less exercise, and poorer diet (Ng & Jeffrey, 2003). A review of 46 studies examining health behaviors and work stress found consistent relationships only with increased alcohol consumption (particularly among men) and increased likelihood of being overweight (but did not assess the cause of the obesity, such as inactivity or overeating) (Siegrist & Rödel, 2006).

Some studies have focused specifically on relations between stress and *types* of food consumed, demonstrating that higher stress is related to consumption of more fast food (Steptoe, Lipsey, & Wardle, 1998), more calorically dense food (O'Connor, Jones, Conner, McMillan, & Ferguson, 2008), and overconsumption of foods normally avoided or eaten in moderation (Zellner et al., 2006). It should be noted, however, that these studies did not specifically look for evidence of participants turning to a certain food as a dependent variable; the links between food choices and stress are correlational in nature. In a sample of European college students, women's perceived stress was associated with higher consumption of sweets and fast foods and lower consumption of fruits and vegetables, whereas depressive symptoms were linked with lower consumption of fruits, vegetables, and meat; stress was not related to food choices for men (Mikolajczyk, El Ansari, & Maxwell, 2009). Similar findings were reported in a study of adolescents in the United States: greater stress was associated with more fatty food intake, less fruit and vegetable intake, and more snacking, results that were similar for boys and girls (Cartwright et al., 2003). In a daily diary study, community residents who experienced more daily stress consumed more between-meal snacks, high-fat snacks, and high-sugar snacks (O'Connor et al., 2008). Links between stress and increased intake of unhealthy food have also been demonstrated in laboratory studies (e.g., Zellner et al., 2006).

Stress–health behavior links are not always straightforward, and some studies have shown that these links depend on both type of stressor and gender. For example, data from a large community survey showed that for women, smoking and alcohol consumption were positively associated with marital conflict, whereas for men, smoking was positively associated with job demands, especially when combined with low decision latitude. However, for men, exercise levels were *positively* correlated with marital conflict and job stress (Cohen, Schwartz, Bromet, & Parkinson, 1991).

Studies explicitly assessing health behaviors as coping responses to stress

As noted above, researchers seldom ask people directly about their use of health behaviors as coping, although this perception of health behaviors as coping is common. For example, in a recent poll of 1420 adults taken by the American Psychological

Association, among the top answers to the question of how they cope with stress were exercising, eating, drinking alcohol, and smoking (American Psychological Association, 2013). A focus group study of low-SES individuals living in New York City also demonstrated the common perceptions of stress, coping, and health (Kaplan, Madden, Mijanovich, & Purcaro, 2013). All study participants endorsed the notion that “the stressors experienced in their community lead to poor health outcomes” (p. 2). Some also resorted to unhealthy behaviors such as smoking and poor diet as a response to stress in an effort to “self-[medicate]” and “self-[soothe].” All participants recognized that overeating, under-eating, smoking, and drinking were unhealthy ways to cope with their stress, but said that their “willpower to resist [bad health behaviors] was depleted after a long and stressful day.” The notion of health behaviors as coping is common at the other end of the socioeconomic spectrum as well: A survey of working physicians found that roughly 30% used physical exercise as a direct means to reduce work-related stress and anxiety (Lemaire & Wallace, 2010).

A few researchers, acknowledging this common use of health behaviors as coping, developed measures assessing this motive. In particular, researchers have developed measures that include a stress-reduction or emotion management motive for drinking (e.g., Cooper, Russell, Skinner, & Windle, 1992), eating (e.g., Van Strien, Frijters, Bergers, & Defares, 1986), smoking (Thomas, Randall, Book, & Randall, 2008), and exercise (Markland & Ingledew, 1997).

Research examining these health-behaviors-as-coping motives has demonstrated that they are related to actual increased engagement in the index behavior in stressful situations. Much of this research concerns motives to use alcohol to reduce tension or expectancies regarding its effectiveness in that regard; both have been associated with a positive stress–alcohol use link in many studies (e.g., Carney, Armeli, Tennen, Affleck, & O’Neil, 2000; Carrigan, Ham, Thomas, & Randall, 2008; Young & Knight, 1989). For example, a daily diary study found that college students higher in the motive of drinking to cope were more likely to drink more on those days they appraised as relatively more stressful (Park, Armeli, & Tennen, 2004).

A fair amount of research has been conducted on the construct of emotional eating, the general feeling or urges to eat in response to negative emotions (Arnow, Kenardy, & Agras, 1995). A great deal of research has shown that high levels of emotional eating are often associated with other unhealthy behaviors, such as decreased intake of fruits and vegetables, increased consumption of fatty foods and foods high in carbohydrates, and increased consumption of alcohol or tobacco products (Eisenberg, Olson, Neumark-Sztainer, Story, & Bearinger, 2004; van Kooten, de Ridder, Vollebergh, & van Dorsselaer, 2007). Importantly, however, the negative emotions for which people eat may arise from many sources besides stressful events and therefore technically would not be considered “coping” from the traditional coping perspective (Lazarus & Folkman, 1984).

However, even studies that assess general health-behavior-as-coping motives typically do not explicitly ascertain whether the health behavior was performed as an effort to deal with stress in particular situations. For example, a study of university students found that expectancies that eating could reduce negative affect were related to more binge eating and higher body mass index (BMI), but no measure of stress was deployed (DeBoer et al., 2012). Linking these motives to actual performance of health behaviors in response to stressful situations is essential to understand coping: As Lazarus and Folkman (1984) noted, many factors determine the coping employed in particular stressful encounters.

Without directly assessing the coping efforts in which people engage, including their increase or decrease in particular health behaviors, the extent to which people are actually employing health behaviors as coping remains a mystery.

A small number of studies have explicitly asked participants whether they used a health behavior to cope with a particular stressor or with general stress. For example, Thome and Espelage (2004) created an exercise as coping scale, asking a sample of college students how often they exercised “when faced with a difficult or stressful situation.” Higher scores on this coping style were related to higher levels of exercise as well as higher levels of positive affect and life satisfaction and less anxiety. However, this study did not directly assess stress or stressful events.

A sample of nearly 6000 people from a study cohort in Northern Finland (Laitinen, Ek, & Sovio, 2002) were classified as stress-driven eaters or drinkers or not based on their answer to a single item from the Ways of Coping Questionnaire (“I tried to make myself feel better by eating, drinking, using medication, etc.”); the article does not specify the question for which this item was a response (e.g., How they deal with stress generally?, How they have dealt with a recent stressor?). Those classified as stress-driven eaters or drinkers reported eating more foods high in fat, carbohydrates, and calories, such as pizza, sausages, burgers, and chocolate. Stress-driven eating and drinking was also associated with higher levels of alcohol consumption. Women classified as stress-driven eaters or drinkers had a higher BMI than those classified as non-stress-driven. Again, this study did not actually assess stress.

One important study, a 10-year longitudinal study of 424 adults diagnosed with depression at baseline (Harris, Cronkite, & Moos, 2006), directly assessed exercise coping with a single item: how often participants “exercised more to cope with an important problem or stressful event they had faced in the previous year” (p. 81). Participants also completed a measure of physical exercise. The measure of exercise to cope and the amount of exercise reported were modestly correlated ($r = .22$) and both predicted decreased depression over time. Once again, this study did not directly assess stress. In fact, we could find no study that explicitly assessed stress and diet or exercise behaviors as coping.

Considering health behaviors as coping behavior

Findings from various areas of research converge on the notion that health behaviors are affected by stress and often constitute efforts to cope with it, yet relatively little research has explicitly examined health behaviors *as* coping per se within a standard stress and coping paradigm (Lazarus & Folkman, 1984) and much remains to be discovered. For example, researchers have studied at length the types of resources and appraisals that lead to many coping strategies (Aldwin, 2007), yet little is known about the person and process variables that lead to using health behaviors as coping. Further, few studies have examined health behaviors as coping vis-à-vis other types of coping to examine their interrelations. It may be that people are more or less likely to employ or change their health behaviors as a strategy for coping with stress depending on their use of other coping strategies. Further, because few researchers have explicitly framed health behaviors as coping, virtually no research exists examining their effectiveness relative to other coping strategies on standardly assessed outcomes of coping processes such as

mood, quality of life, or psychological adjustment (Aldwin, 2007). That is, how well do health behaviors work as coping efforts?

Examining health behaviors as coping presents opportunities for many integrative and creative avenues for new research that will lead to a fuller and deeper understanding of a central function of these health behaviors. For example, one fascinating line of research suggesting that viewing of health behaviors as coping can yield important information is that of Jackson and colleagues (e.g., Jackson, Knight, & Rafferty, 2010), who found, in epidemiological studies, that poorer diet and increased smoking were related to better mental health (but poorer physical health) in African-Americans, but not Caucasians. They suggested that (but did not directly assess whether) health behaviors are used to cope with stress and may have opposite effects on mental and physical health that are further influenced by different personal and contextual factors.

Challenges in advancing knowledge of health behaviors as coping behaviors

The obvious way forward is to study health behaviors *as coping behaviors*: Researchers must begin to examine the conditions under which health behaviors are, in fact, coping efforts and to understand how health behaviors function as coping. Potentially groundbreaking information may be discovered using the well-developed research conceptualizations and methods of stress and coping researchers (Aldwin, 2007; Folkman, 2011). While we believe that taking a transactional stress and coping approach is essential in advancing our understanding of health behaviors and informing future intervention development, we recognize that this approach is not without many conceptual and methodological challenges, some of which we outline below.

Conceptual considerations

Health behaviors are not always coping

Health behaviors are the products of many different motives. As discussed above, researchers have designed motivation questionnaires for many health behaviors and have demonstrated that people engage in each behavior for myriad reasons, only one of which is coping. For example, people exercise to stay fit, to socialize, to have fun, and to look more attractive as well as to cope with stress (Thøgersen-Ntoumani, Fox, & Ntoumanis, 2005). Similarly, people drink alcohol to socialize and to celebrate as well as to cope with stress and distress (Cooper et al., 1992; Halim, Hasking, & Allen, 2012). Further, any given instance of a health behavior may have multiple motives (e.g., one might drink alcohol on a weekend outing to socialize with friends but also use that alcohol consumption to reduce tension) (Cooper et al., 1992).

Health behaviors may serve to regulate emotions without awareness

Coping is typically defined as engagement in effortful and deliberate strategies to manage a specific stressor and to regulate distress related to that stressor (Aldwin, 2007). Although many people report implementing health behaviors such as eating more than usual to manage stress and distressing emotions (e.g., Kaplan et al., 2013), it is also the case that many people are not aware of their motives for engaging in health behaviors (Sheeran, Gollwitzer, & Bargh, 2013) and, in fact, may not even be aware of the links

between the discomfort they feel (e.g., tension, fear, anger) and the stressors they have experienced. In such instances, health behaviors may serve as implicit emotion-regulation strategies but, given people's lack of awareness of these links, engaging in such behaviors does not meet the commonly used definition of coping as deliberate (DeSteno, Gross, & Kubzansky, 2013). People's awareness of the motives underlying their behavior and the extent to which conscious and nonconscious processes spur behavior are issues extending far beyond the present focus on health behaviors, but as this area develops (e.g., Kruglanski & Gigerenzer, 2011), it should be brought to bear on issues of stress and health behaviors.

Health behaviors can be ancillary outcomes of stress or coping rather than coping efforts

Health behaviors may be affected by stressful situations or coping efforts without themselves constituting coping behavior. For example, people may cope with bereavement by increasing their social involvement in a religious community, which might entail eating higher-fat, more calorically dense food (Kim & Sobal, 2004), but the change in diet is a side effect of that coping rather than an essential part of it. One study showed that mothers of children being treated for cancer gained weight during their child's treatment; as they helped their child deal with treatment and managed their own distress, these women had less time or opportunity to eat healthily or exercise, but these changes were likely a secondary outcome of their coping rather than an effort to cope per se (Smith, Baum, & Wing, 2005).

Use of health behaviors as coping may be associated with other types of coping

As some research has demonstrated, some types of commonly assessed coping strategies are related to health behaviors as coping. For example, emotional eating (reporting a general urge to eat in response to negative emotions and distress) is related to both emotion-focused and avoidant coping styles (Raspopow, Abizaid, Matheson, & Anisman, 2010). Some studies that examined stress, coping, and health behaviors did not consider the health behaviors as coping, but rather as an outcome of the coping (e.g., Martyn-Nemeth, Penckofer, Gulanic, Velsor-Friedrich, & Bryant, 2009). Future research that examines health behaviors as coping efforts as well as outcomes must carefully conceptualize these study variables.

Stress and health behaviors have physiological dimensions

Clearly, both stress and health behaviors have physiological aspects; these are being increasingly explicated in research. For example, cortisol, a biomarker of stress, has been associated with consumption of highly palatable food that, in turn, decreases stress (Adam & Epel, 2007; Epel, Lapidus, McEwen, & Brownell, 2001). Exercise also has many physiological, stress-reducing effects, demonstrated in both humans and non-human animals (e.g., Dishman, Renner, White-Welkley, Burke, & Bunnell, 2000), although exercise itself also comprises short-term stress. Future research linking stress and health behaviors must attend to these complex, underlying physiological dimensions.

Methodological considerations

Lack of assessment tools

Most widely used measures of coping contain few or no items assessing health behaviors, and of those that do include them, these items are typically considered along with other items tapping an avoidance dimension (see Ingledew et al., 1996, for a review). Ingledew and his colleagues created a supplementary coping measure consisting of items assessing exercising, eating, consumption of caffeinated beverages, and general self-care. Interestingly, they included items that were in the direction of increased healthfulness (e.g., “I make an effort to eat regular meals”) and decreased healthfulness (e.g., “I eat foods I know are not really good for me”). Their health-behavior-coping items formed three scales, one for eating, one for exercise, and one for self-care. In a subsequent study, Ingledew and McDonagh (1998) found that health-behavior-related coping served problem-solving and preventive functions. Unfortunately, few research studies have used this measure, so its characteristics are not well established. Clearly more measurement development is needed to examine health behavior as coping.

Directionality/valence of change in health behaviors as coping

Ingledew and colleagues’ (1996) efforts at measurement development highlight an important issue regarding the use of health behaviors as coping: People sometimes increase in the healthfulness of a given behavior as an effort to cope (e.g., trying to eat more healthfully) and sometimes decrease in the healthfulness of that same behavior (e.g., eating more junk food). Ingledew and colleagues (1998) noted the different functions that such differential changes might serve (e.g., avoidance versus problem-solving).

Non-equivalence of health behaviors

Although health behaviors share underlying commonalities, each also has unique properties (Pampel, Krueger, & Denney, 2010). The use of each specific health behavior as coping may have distinct correlates and outcomes and, as noted above, some people might increase the healthfulness of a particular behavior as a coping effort while others decrease the healthfulness. This uniqueness means that studies examining health behaviors in the context of coping must attend to each specific health behavior to understand its role in stress and coping.

Individual differences

The role of health behaviors for any particular individual likely depends on many characteristics of that individual, including demographics, culture, personality, and social environment. For example, copious research has shown that people’s scores on restrained eating are important in predicting their responses to subsequent food consumption following laboratory stressors (e.g., Stice, 2002) and in naturalistic settings (e.g., O’Connor & O’Connor, 2004). The abovementioned daily diary study of O’Connor and colleagues (O’Connor, Conner, Jones, McMillan, & Ferguson, 2009) found that conscientiousness moderated the links between daily hassles and daily vegetable consumption, smoking, and likelihood of exercising. Gender also appears to be an

important factor in the use of health behavior as coping. For example, the above-mentioned study of college students found that men were more likely than women to report exercising as a way to reduce stress (Thome & Espelage, 2004).

Health behavior coping may be differentially related to and effective for different types of stressors

Transactional stress and coping theory posits that different types of coping may elicit and be relatively more or less effective for different types of stressors (Lazarus & Folkman, 1984), which is likely true for health behaviors as coping as well (Greeno & Wing, 1994). For example, in the daily diary study of O'Connor and colleagues (2008), ego-threatening, interpersonal, and work-related hassles were associated with increased snacking, but physical stressors were associated with decreased snacking, suggesting that (but not directly testing whether) participants were using snacking more for coping with some kinds of stressors. Further, the specific meanings (appraisals) people assign to their stressors (e.g., challenge, controllability) may influence the use of health behaviors as coping, but there is as yet little research available on this notion.

Accuracy of self-report measures

A perennial problem in psychological research is the use of self-report measures, which are commonly employed to capture many central constructs in spite of their known limitations. Particularly when reporting sensitive issues like one's health behaviors, these measures are potentially distorted by biases such as social desirability, self-deception, and motivated forgetfulness (e.g., Paulhus & John, 1998). Further, the validity of many of the widely used measures in the field of health behavior remains controversial. For example, some research suggests that measures of emotional eating may be poor predictors of eating behavior. Using a laboratory paradigm, Adriaanse, de Ridder, and Evers (2011) found that, for normal-weight women, a measure of emotional eating did not capture the tendency to eat under emotional conditions, but rather reflected beliefs about the relation between emotions and eating. Accurate assessment of participants' use of unhealthy behaviors to cope with their stressors poses problems that may be addressable with future measurement development.

Coping through health behaviors as deviations from one's baseline

One difficult issue when examining health behaviors in the context of stress and coping is knowing how much a health behavior deviates from one's "usual" (and then determining how much of this deviation is due to coping). For many, health behaviors are habitual and routine (Pampel et al., 2010). Determining the extent to which a particular health behavior involves following one's usual routine versus changing one's routine (e.g., going for a run when one would habitually do so versus going for a run when one would not normally do so) may be one way to discern when health behaviors are being used as coping. Some studies have, in fact, asked participants if they have done more or less than usual of a health behavior on a given day and then linked change with stress, assuming that coping was the motive underlying that change (e.g., O'Connor et al., 2008). Strengths of this approach include taking baseline into account and allowing participants

to report both more and less healthful change. Examining both directions is important, because for some health behaviors, the important aspect of measurement may not be the performance of a behavior but rather its absence (e.g., not exercising when one normally would). However, this approach lacks assessment of the actual levels of a given behavior as well as motives or intention to cope.

Suggestions for future research

Clearly, much work is needed to better understand the phenomenon of health behaviors as coping. Because the voluminous research on health behaviors has typically failed to take a stress and coping perspective, the need for conceptually solid, methodologically rigorous research is great. Some of this necessary work involves basic measurement development, as detailed above. Once good measurement approaches are developed, the questions to be explored are tantalizingly open and potentially of both great theoretical and practical significance.

One important research area with which the perspective of health behaviors as coping must interface is that of self-regulation. Theory and research on self-regulation have proliferated in recent years (Heller & Lapierre, 2012; McKay, Wood, & Brantley, 2007; Vohs & Baumeister, 2013) and in some ways has supplanted a focus on coping. This is unfortunate, because although theories of self-regulation often focus on goal pursuit (Carver & Scheier, 2001), much research from this perspective focuses on inner processes such as reappraisal or suppression (DeSteno et al., 2013). Importantly, coping captures the processes of active problem solving as well as emotional regulation (Aldwin, 2007); engaging in health behaviors in an effort to cope with stressors may comprise problem-focused as well as emotion-focused coping (e.g., eating more healthfully in response to news of heightened health risk). An advantage of the self-regulation perspective is that it encompasses both deliberate coping efforts and implicit (nonconscious) efforts to regulate oneself (DeSteno et al., 2013). An advantage of the coping perspective is that it takes into account the personal meaning of the health behavior (Harris et al., 2006).

An additional step in this line of research is contextualizing the use of health behaviors as coping or self-regulation within the broader nexus of other influences on health behaviors. This is a very complex set of phenomena, and complex models of these influences and their interactions must be developed and tested. It is important that researchers consider these issues in the general population; to date, much of the research on emotional eating or drinking to cope motives have been conducted with samples identified as having particular pathology, such as those with eating disorders or alcohol dependence, limiting their generalizability.

Researchers should employ a variety of methods to better understand interrelations among stress, coping, and health behaviors. Methods using daily diaries, ecological momentary assessment, or event-contingent sampling can better characterize these relationships sequentially over time and allow the examination of individual differences in these relationships as well. Laboratory-based research is also needed, particularly to better understand the causal nature of these relationships and their physiological underpinnings.

This line of research on health behaviors and coping raises the important question: could helping people more effectively manage their stress without explicitly focusing on health behaviors have substantial effects on improving health behaviors? If so, many new

avenues are opened for creating interventions that may appeal to and be appropriate for a broad span of people. Surprisingly little research (we could locate almost none) has examined health behavior change resulting from stress management interventions. Further, people often report having high levels of distress and struggles in managing life stressors; they may be open to stress management interventions that secondarily lead to improvements in their health behaviors even if they are not intentionally working to improve them (Belar & Deardorff, 2009).

Health behaviors can be effective in reducing stress and tension. For example, some research has shown that smokers with social anxiety smoke more in social situations, which makes them feel more comfortable (Watson, VanderVeen, Cohen, DeMarree, & Morrell, 2012). When under stress, people may engage in health behaviors such as eating calorie-, fat-, and sugar-dense foods, smoking, or drinking alcohol as coping efforts for short-term relief in spite of the fact that they may have longer-term negative effects or create additional stressors (e.g., people's worries about their weight, smoking, alcohol consumption, or the health crises deriving from them). Interventions aimed at helping individuals reduce negative health behaviors that function as coping must take into account that these short-term rewarding, stress-reducing effects, and help individuals identify the shortcomings of these health behaviors as coping and to find other equally effective and less harmful ways to handle their stress (Shadel & Mermelstein, 1993). Development and evaluation of such innovation in interventions awaits further conceptual and methodological development. It is our hope that this presentation of issues and suggestions for future research will help to spur such development.

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