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Introduction

Denollet, J.; Nyklicek, I.; Vingerhoets, A.J.J.M.

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Chapter 1

Introduction: Emotions, Emotion Regulation, and Health

Johan Denollet, Ivan Nyklíček, and Ad J.J.M. Vingerhoets

Emotions may be considered as the spices of our lives. They enable us to enjoy life to the fullest, but they also have other important functions. There is the interpersonal, communicative function aimed to signal to others information about our internal state and behavioral intentions (Frijda, 1986). In addition, specific intrapersonal functions of emotional expression have been demonstrated. For example, emotions make us aware of what really is important in our lives. As such, they are important for adequate decision making (Bechara, Damasio, & Damasio, 2000). In addition, they help and prepare us to better deal with environmental demands.

Emotions manifest themselves in specific cognitive, behavioral, and physiologic reactions and they are crucial for adaptation to new situations. Emotions result from the outcome of the evaluation of environmental stimuli. When attended to and appraised in certain ways, a coordinated set of responses involving behavioral and physiologic systems is triggered (John & Gross, 2004). As such, emotions provide the necessary physiologic support for emotion-specific action tendencies, thereby facilitating overt action. A clear example of this process is the fight-flight reaction, which implies increased heart rate and blood pressure, dilation of the bronchi, and increased blood flow to the muscles, preparing the body for action. Depressed affect and grief, as another example, are characterized by a quite different physiologic reaction pattern, aimed at the conservation of energy. There is apathy and often a reduced muscle tone with the head directed downward—there is no intention for action. Passivity prevails, and sexual and maternal drives are strongly reduced (Henry & Stephens, 1977; Vingerhoets & Perski, 2000). The idea is that this passive condition may reduce aggression and instead may act as a manifest signal to indicate that the person is in dire need of emotional or instrumental support from others (Nesse, 2000; Thornhill & Thornhill, 1989).

In light of their adaptive function, it is plausible that emotions have played an essential role for survival in the course of human evolution. It is important to note, however, that this does not mean that emotions should be regarded as outdated adaptation systems that were only advantageous for the human species in the very past. In fact, they still are crucial for proper psychologic functioning in the current modern society. For example, emotions are essential for adequate decision making. The notion that emotions should be considered as the opposite of the ratio and not important for cognition has to be qualified as obsolete and incorrect

(Bechara, Damasio, & Damasio, 2000). But perhaps most important for this volume, the health-promoting effect of emotions in the social world depends on our ability to regulate these emotions in an adaptive way.

Adaptive Regulation of Emotions

As pointed out by John and Gross (2004), emotions are often helpful, but sometimes destructive. With reference to this issue, two important aspects of emotions need to be disentangled: (i) the subjective experience of emotions per se and (ii) the regulation of these emotions. Among other things, a major challenge is to find ways of regulating one's emotions so that one retains their helpful features while limiting their potentially destructive aspects. The things we do before an emotion response has become fully activated determine our physiologic and behavioral reactions. Cognitive reappraisal, or changing the way we perceive a potentially emotion-eliciting event, is one way of modifying the emotional impact of a situation (John & Gross, 2004). If one thinks that another person plans to do harm, this may induce anger; if an unpleasant situation is considered as being caused by one's own behavior, this will probably result in remorse, shame, or guilt. If a situation is appraised as involving danger, fear is a likely emotional outcome, whereas loss experiences generally evoke sadness.

Emotion regulation not only depends on our appraisal of the emotion-eliciting event. The things we do once the emotion process is already under way and response tendencies have already been generated, are of equal importance (John & Gross, 2004). For instance, in addition to cognitive reappraisal, emotion suppression is another emotion regulation strategy that is used commonly in everyday life. Emotion suppression is a form of emotion regulation that involves consciously inhibiting ongoing expression of emotion-related behavior. As such, nonexpression changes the way we respond behaviorally once we are already in an emotional state (Gross & Levenson, 1993).

When focusing on the effects of emotions on well-being and health, it should be kept in mind that this possible influence may not be the mere direct physiologic consequence of the expression of emotions. The many interpersonal aspects, including the nature of the relationship with the individual to whom one expresses and his or her reaction, are also important. For example, crying has been shown to very likely elicit emotional support. It may be this social support or the fact that an opponent becomes less aggressive that makes one feel better rather than the shedding of tears per se (see Hendriks et al., this volume).

In addition, the causal direction may also be the other way around: Using emotion suppression makes individuals feel inauthentic and bad about themselves and thus more prone to experience negative emotions and depressive symptoms (John & Gross, 2004). Suppression decreases the behavioral expression of negative emotions but not their subjective experience. In social contexts, suppressors may fail to respond appropriately to others and may avoid interpersonal interaction (John & Gross, 2004). Importantly, there is increasing evidence that emotion regulation

styles aimed at not expressing emotion, either consciously or unconsciously—in the latter case often called repression—may have adverse effects on physical health (Myers et al., this volume; Nyklíček, Vingerhoets, & Denollet, 2002).

Nonexpression of Emotions and Health

Given the fact that suppression modifies the behavioral aspect of the emotion response tendencies without reducing the experience of negative emotion, these negative emotions may continue to linger and accumulate unresolved (John & Gross, 2004). There is little doubt that emotions may have an immediate impact on our physiologic functioning. Among the most dramatic examples is emotional fainting. Individuals suffering from blood phobia may lose their consciousness at the mere sight of blood or when undergoing rather innocent procedures such as taking blood samples (Vingerhoets & Schomaker, 1989). This is caused by a strong decrease in heart rate and a widening of the blood vessels. However, there is also evidence to suggest that chronic unresolved negative emotions can trigger acute, life-threatening cardiac events. Emotionally stressful events may trigger the onset of acute myocardial infarction. An outburst of anger, for example, may trigger the incidence of an acute myocardial infarction during the first 2 hours after the anger-evoking incident (Mittleman et al., 1995; Moller et al., 1999). But the risk of a myocardial infarction may also be increased during vacation travel; for example, adverse driving conditions or changes in climate may increase the risk for acute myocardial infarction during the first 2 days of vacation (Kop, Vingerhoets, Kruithof, & Gottdiener, 2003).

Sudden and profound emotional stress (e.g., death of relatives, domestic abuse, severe arguments, medical diagnoses, devastating financial loss) can also trigger acute heart failure in individuals who are free from cardiac disease (Engel, 1971). Reports of acute heart failure triggered by psychological stress thus are not confined to Japan, where this syndrome was labeled *Tako-tsubo cardiomyopathy*. Recent studies have also identified emotional stress as a trigger of acute heart failure in individuals from Western societies (Sharkey et al., 2005; Wedekind, Moller, & Scholz, 2006; Wittstein et al., 2005). This condition is characterized by a distinctive form of acute left ventricular dysfunction and is reversible with appropriate medical therapy. Exaggerated sympathetic stimulation is probably central to the cause of this syndrome of acute heart failure due to emotional stress (Wittstein et al., 2005).

In conclusion, there is ample evidence that experiencing intense negative emotions may have an acute effect on bodily functioning. However, chronic emotional distress is also a powerful determinant of adverse cardiovascular outcomes. Various psychological factors have been associated with the incidence and progression of heart disease, like chronic life stress (Rozanski, Blumenthal, & Kaplan, 1999), depression (Barth, Schumacher, & Herrmann-Lingen, 2004), anxiety (Moser et al., 2007), low social support (Orth-Gomer et al., 1998), and personality (Denollet et al., 1996; Denollet, Vaes, & Brutsaert, 2000). These factors

often cluster together, and this clustering elevates the risk for cardiac events even more (Albus, Jordan, & Herrmann-Lingen, 2004).

However, it is important to consider the notion that—apart from the mere experience of negative emotions—the failure to use adaptive emotion regulation strategies might be detrimental to health as well. The popular literature is replete with warnings that it may be damaging for one's health to inhibit one's emotions and the expression of them. Anger must be released and tears must flow, because otherwise these emotions may seriously affect one's physical functioning (Cornelius, 2001; Bushman, 2002). In particular, when these behaviors are the consequence of specific stable personality traits, the person is said to be at increased risk of several somatic problems.

In contrast with this popular belief that nonexpression of emotions may be detrimental to health, the medical community has frequently qualified this notion as folklore and scientifically ungrounded. Despite this skepticism, there is empirical evidence to suggest that nonexpression of emotions increases the risk of somatic disease. Experimental research has shown that emotional inhibition is associated with increased cardiovascular reactivity (Gross & Levenson, 1997) and decreased cardiovascular recovery and heart rate variability (Brosschot & Thayer, 1998). Epidemiologic research has shown that anger inhibition is associated with high blood pressure (Steffen, McNeilly, Anderson, & Sherwood, 2003) and cardiovascular death (Graves, Mead, Wang, Liang, & Klag, 1994; Harburg, Julius, Kaciroti, Gleiberman, & Schork, 2003). Emotional inhibition has also been linked to immune dysregulation in patients with human immunodeficiency virus (Cole, Kemeny, Fahey, Zack, & Naliboff, 2003).

Undoubtedly, many issues concerning the health impact of emotion regulation strategies remain to be answered. Among other things, it is unclear to what extent and why some forms of emotion regulation may be healthier than others. It has been suggested that using cognitive reappraisal to regulate emotions is associated with healthier patterns of psychological functioning than applying suppression (John & Gross, 2004), but more experimental and epidemiologic research is needed to examine the validity of this notion. Another important issue relates to the determinants of individual differences in emotion regulation styles.

Individual Differences

The expectation that significant others will not be available appears to fuel the suppression of emotions (Dozier & Kobak, 1992). In addition, more temperamental precursors for suppression have been identified, including introversion (John & Gross, 2004) and shyness (Melchior & Cheek, 1990). The past decades have witnessed the description of several psychological constructs and personality features to describe more or less stable individual differences in emotion regulation strategies. Well-known examples include alexithymia (Lumley, Gustavson, Partridge, & Labouvie-Vief, 2005), the repressive coping style (Myers, Brewin,

& Power, 1998), Type C coping style (Temoshok, 1987), and lack of emotional intelligence (Salovey & Mayer, 1990).

Unfortunately, the clinical implications of this research are still far from clear and certain. The cross-sectional nature of many studies prevents drawing definitive conclusions about the nature of the relationship between nonexpression and health outcomes, and there is also a lack of insight into the underlying mechanisms that may explain this relationship. Some recent studies have tried to address these issues in research on the health implications of social inhibition in patients with human immunodeficiency virus infection (Cole, Kemeny, Fahey, Zack, & Naliboff, 2003) and coronary heart disease (Denollet et al., 2006).

With reference to this issue, research on the health effect of Type D personality in cardiac patients indicates that social inhibition may modulate the impact of negative emotions on long-term prognosis (Denollet et al., 2006). Type D personality refers to individuals who have an elevated score on negative affectivity (or the tendency to experience negative emotions across time and situations) and social inhibition (or the tendency to inhibit the expression of emotion and behavior during social interaction). This personality type has been shown to reliably predict mortality, morbidity, and poor quality of life in several groups of patients suffering from cardiovascular disease (e.g., Al-Ruzzeh et al., 2005; Aquarius, Denollet, Hamming, & De Vries, 2005; Denollet et al., 1996; Denollet, Vaes, & Brutsaert, 2000). Importantly, only those individuals who score high on *both* negative affectivity *and* social inhibition are at increased risk for poor health outcomes (Denollet et al., 1996). Recently, we have specifically examined the interaction between social inhibition and negative affectivity as a determinant of prognosis after balloon angioplasty treatment (Denollet et al., 2006). This study showed that the combined effect of social inhibition and negative affectivity, rather than negative emotions alone, was an independent predictor of poor prognosis. Interestingly, individuals with high negative affectivity but low social inhibition were not at increased risk for a major adverse cardiac event. Hence, more research is needed to test the hypothesis that inhibition or other emotion regulation strategies may modify the effect of negative emotions on physical health.

About This Book

In the past decade, we have organized three conferences focused on these issues at Tilburg University. During these conferences, international experts present their latest findings and discuss them with fellow researchers.

This book contains a selection of the updated body of knowledge based on the key contributions of the 2003 meeting. The contributions provide the latest insights into a wide array of topics such as the writing paradigm, alexithymia, crying, repression, and so forth. We included both fundamental and basic research on emotion regulation as well as more clinically oriented contributions in order to cover a wide range of relevant research. The contributions can be classified into two broad

categories. In the first category, the focus is on conceptual and developmental issues. In the second category, clinical perspectives and interventions are the main issues.

The first part of this volume, on the fundamental, conceptual, and neurobiologic bases of emotion regulation, starts with a chapter by Koolhaas and de Boer. In their contribution, some intriguing findings from animal studies are summarized. The distinction between proactive (being also more expressive) and reactive (less expressive) coping styles among rodents has proved to be differently associated with overt behavior as well as with neuroendocrine responses to laboratory challenges. Interestingly, these differential reactions putatively make the two types of animals also differently susceptible to diseases and are additionally associated with different effects of pharmacologic agents.

In Chapter 3, the focus is on the personality aspects of different alexithymia types. Moormann and colleagues have developed a model containing five alexithymia types. Their different personality features, coping approaches, and vulnerability to stress-related mental and physical problems are discussed. Lumley and colleagues present in Chapter 4 their critical considerations concerning the relationship between alexithymia and the development of health problems. They show that various pathways may be responsible for research findings, ranging from direct physiologic effects of alexithymia to third-variable explanations. In addition, they put forth important challenges for future research on this topic. In Chapter 5, Myers and colleagues review the studies of the past three decades on repressive coping. They summarize the available evidence for a link between this style and various health problems and discuss the critique as well as the possible cognitive and psychophysiologic mechanisms explaining the link. The latter issue is just starting to be investigated systematically.

Chapter 6 is devoted to adult crying. Hendriks and colleagues put forth some challenging ideas about the potential mechanism of the effect of crying on well-being. From an attachment-theory perspective, they provide preliminary evidence for the view that the positive effects of crying may be brought about by positive responses from the social environment as a result of this potent signal of a need for caring, help, and support. Emotional intelligence is the topic of Chapter 7, written by Van Heck and Den Oudsten. In this comprehensive contribution, the authors critically discuss the concept of emotional intelligence and examine its relation with the standard intelligence concept. In addition, they address the important issue of its assessment and summarize the scarce research results regarding its impact on health.

The second part of this volume, on clinical perspectives and interventions, begins with Chapter 8, a contribution by Rottenberg and Vaughan on emotion expression in depression. Both naturalistic and experimental studies are reviewed, concluding that depression may be accompanied by emotion context insensitivity, which is characterized by rather stereotypical emotional response patterns without much variation across situations. Rodebaugh and Heimberg (Chapter 9) argue that many affective problems involve dysfunctional emotion regulation. In their view, treatment should more explicitly aim at enhancing self-regulation and emotion regulation. Van Dijke (Chapter 10) provides the readers with an example of how disturbances with emotion regulation are treated with a comprehensive, multidisciplinary

approach in a psychiatric hospital setting. Emotional inhibition as a factor in eating disorders is discussed by Bekker and Spoor in Chapter 11. They argue that especially anger inhibition may be an important maladaptive response style highly prevalent among eating-disordered women displaying oversensitivity to others. In Chapter 12, Rieffe and colleagues present empirical findings relating to the relevance of emotional competence for somatic complaints in children. They present data supporting their view that maladaptive coping strategies, such as an attentional overemphasis on internal bodily symptoms, may be key factors promoting somatic complaints. In Chapter 13, Nelson describes various types of crying behavior, especially in the clinical context, which can be used to identify attachment styles of the patient.

The last two chapters of this volume are devoted to Pennebaker's renowned writing disclosure intervention. First, Smyth and colleagues provide an in-depth discussion of the writing paradigm in the clinical context. They consider issues such as the effects on physiologic systems, the mechanisms that may be responsible for the effects found, and the role of feedback that may be provided to the writer. In the final contribution (Chapter 15), Solano and colleagues present a critique on the emphasis on simple direct (main) effects when evaluating the writing paradigm. They argue and provide examples of studies showing that the effectiveness of this paradigm in the clinical context strongly depends on some specific characteristics of the patients and their situation, such as their personality, their primary disorder, and the recency of an adverse event they may have experienced.

Taken together, this volume provides the reader with a comprehensive and up-to-date overview of the state of the art with respect to emotion regulation in relation to mental and somatic health. The emphasis on clinically oriented papers makes it interesting reading for both researchers and clinicians. Those working in the fields of psychiatry, psychosomatics, behavioral medicine, health psychology, clinical psychology, and medical psychology all can benefit from this unique collection of papers written by internationally leading researchers. We hope that readers will enjoy this volume and that it will stimulate and inspire them.

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