Somatoform disorders as disorders of affect regulation

Article *in* Journal of Psychosomatic Research · September 2004

DOI: 10.1016/S0022-3999(03)00613-5

2 authors, including:

Elisabeth Maria Waller
University of Freiburg
22 PUBLICATIONS **598** CITATIONS

SEE PROFILE

International Review of Psychiatry, February 2006; 18(1): 13–24

Routledge
Taylor & Francis Group

Somatoform disorders as disorders of affect regulation: A development perspective

ELISABETH WALLER & CARL EDUARD SCHEIDT

Department of Psychosomatic and Psychotherapeutic Medicine, University Hospital of Freiburg, Freiburg, Germany

Summary
This paper considers the role of disturbances in affect regulation in the development and course of somatoform disorders. We first give an overview of contemporary theories in the field of psychosomatic medicine that links deficits in emotion regulation to the process of somatization, and then review recent empirical research that focuses on the association between affect regulation and somatoform disorders, with an emphasis on studies investigating the alexithymia construct. Overall, the findings suggest that somatoform disorders are linked to a diminished capacity to consciously experience and differentiate affects and express them in an adequate or healthy way. It must be noted, however, that this result has not been obtained exclusively for somatoform disorders. A promising approach to further our understanding of the developmental roots of impaired affect regulation in somatoform disorders is attachment research. The attachment research reviewed in this paper indicates that a dismissing status of attachment is linked to defensive forms of processing and expressing emotions. We present some new data that not only provide empirical support of a high proportion of dismissing attachment in somatoform disorders but also suggest that the degree to which somatoform disorder patients employ dismissing attachment strategies is strongly related to affect dysregulation. Finally, some implications for psychotherapeutic interventions in patients with somatoform disorders are considered.

Introduction

The primary diagnostic feature of somatoform disorder is the existence of physical symptoms for which there is no adequate medical explanation. Somatoform disorder patients extensively complain about these symptoms and attribute them to medical disease while denying that psychosocial factors may play a role in their suffering. The result is a pattern of help-seeking behaviour that commonly leads to difficult doctor–patient interactions. These characteristic features of somatoform disorders are in most cases enduring and stable in nature and rather difficult to treat.

In terms of aetiology, there is strong presumption that multiple factors make a contribution, including both biological and psychosocial risk factors (Kellner, 1990). Regarding psychological factors there is increasing evidence that somatoform disorders are linked to dysfunction in personality (Bass & Murphy, 1995; Noyes et al., 2001). Among the various personality traits emotion-regulation focused as well as interpersonal personality traits have been placed in a central position in influencing symptom reporting and help-seeking behaviour. In the present review we highlight the potential role of disturbances in affect regulation as an essential risk factor in causing or sustaining somatoform disorder. To further our understanding of difficulties with the regulation of affect in somatoform disorders the developmental perspective of attachment theory is applied.

Somatoform disorders and affect regulation: Theoretical considerations

Researchers from diverse perspectives are giving deficits in affect regulation a central place in their definitions and theories of somatoform disorders. Absence of emotional experience, for example, is a central descriptive feature in Lipowski's (1987) revised definition of somatization: somatizing patients primarily experience and communicate somatic, not psychological distress and seek help for these symptoms. This definition is applicable to patients with diagnosable anxiety and depression disorders who complain to their doctors of bodily rather than of affective symptoms (Bridges & Goldberg, 1985). Lipowski's (1987) description also applies to patients with a primary diagnosis of somatoform disorders who rarely acknowledge

Correspondence: Dr. phil Dipl. Psych. Elisabeth Waller, Abteilung für Psychosomatik und Psychotherapeutische Medizin, Universitätsklinik Freiburg, Hauptstr. 8, D-79104 Freiburg, Germany. Tel: +49 761/270 6547. Fax: +49 761/270 6885. E-mail: elisabeth.waller@uniklinik-freiburg.de

ISSN 0954–0261 print/ISSN 1369–1627 online/06/010013–12 © Institute of Psychiatry
DOI: 10.1080/09540260500466774

emotional problems even though psychological conflicts are obvious. Whereas in current descriptive definitions of somatization a relation between somatization and poor affect regulation is merely affirmed, psychodynamic theories of somatization refer to poor affect regulation as a mechanism or cause of medically unexplained symptoms (see Taylor, Bagby, & Parker, 1997, for a recent review). In some of these theories the defensive function of somatization is highlighted (e.g., keeping distressing affects related to inner conflicts unconscious). In other theories somatoform symptoms are viewed as a result of disturbances in the conscious experience of affects (i.e., alexithymia) emerging secondarily as a consequence of traumatic experiences or early attachment failures (Krystal, 1997).

Efforts to link emotion regulation to psychosomatic symptoms can be traced back to the earliest days of psychosomatic medicine. Alexander (1950), for example, postulated an inverse relationship between emotional expression and physiological arousal in response to stress. He argued that physiological processes accompanying fight-or-flight reactions, if not realized into action, changed into dysfunctional permanent physiological activation. The significance of his psychosomatic model is that it explicitly relates emotional non-expression to physiological activity. Other findings supporting the adverse health effect of deficits in affect regulation followed later. In the mid-1970s observations were made that persons with psychosomatic illness often have difficulties in describing and expressing their feelings. This led early psychosomatics to the clinically derived concept of alexithymia (Nemiah & Sifneos, 1970). It was assumed that as a result of the patients' deficits in their capacity to symbolically represent emotions their emotional distress remained unmodulated, thus contributing to adverse physical health outcomes.

For many years Alexander's theoretical formulations and the construct of alexithymia have not gained broadened interest in mainstream psychology, due to the lack of empirical support and methodological assessment problems. However, in the last 20 years, interest in these models was renewed, mainly as result of interdisciplinary efforts and the development of new methods for assessing the constructs discussed above. Furthermore, findings from biological and social sciences refined the concept of alexithymia (see Taylor & Bagby, 2004). Advances in neuroscience and psychophysiology have expanded knowledge about the neural and physiological concomitants of emotional processing and how these might affect health and disease (Damasio, 1999; Le Doux, 1996). In addition, a number of new emotion-related concepts were described and were linked to psychosomatic processes, including, for example, the concept of 'negative affectivity' (Watson & Pennebaker, 1989), the concept of 'inhibition' (Pennebaker, 1989) and the concept of the 'repressive coping style' (Weinberger, Schwartz, & Davidson, 1979).

A broader defined concept that has become popular in the clinical literature is the concept of affect (or emotion) regulation (Gross & Muñoz, 1995; Thompson, 1994). The above mentioned constructs that relate to emotion regulation processes may be subsumed under this concept. Although the precise definition of the concept is unclear, there is consensus that affect regulation encompasses various intrinsic and extrinsic regulatory mechanisms by which individuals may influence their emotional experience and expression. With respect to the mechanisms involved in the process of affect regulation, some authors have highlighted the regulatory interactions between the different components of the emotion response system (e.g., neurophysiological, motor-expressive and cognitive-experiential) as well as the regulatory influence of social relationships (Dodge & Garber, 1991; Krause 2004). In this view, the concept explicitly relates cognitive, neurobiological, physiological, motoric and social mechanism in the process of affect experience and expression. Impairments in the integration of the different components constituting the emotion system have been linked to mental and physical illness (Bucci, 1997b; Taylor et al., 1997). The special significance of the concept of affect regulation is that it facilitates communication between researchers from different disciplines, including psychotherapists, developmental psychologists and researchers in the field of emotion as well as cognitive psychology, thus advancing interdisciplinary efforts.

In their efforts to refine the concept of alexithymia some authors in the field of alexithymia research referred to the concept of affect regulation (Taylor et al., 1997). According to Taylor, Bagby and Parker (1997) alexithymia may be best conceptualized as a disorder of affect regulation reflecting deficits in the cognitive and interpersonal regulation of emotions. The authors suggest that the alexithymic individual's limited capacities to use cognitive mechanisms to understand and regulate emotions lead them to focus on, amplify and misinterpret the bodily sensations accompanying emotional arousal. Martin and Pihl (1985) have suggested that failure to regulate and modulate stress-related emotions at the cognitive level may result in exaggerated physiological and behavioural responses to stressful situations and increased vulnerability to disease.

Other theoretical models that link cognitive deficits in the processing of emotions to somatization have recently been proposed by Richard D. Lane (Lane & Pollermann, 2002; Lane & Schwartz,

1987) and by Willma Bucci (1997a). According to the cognitive-developmental model of emotional awareness advanced by Lane and Schwartz (1987) the capacity to consciously experience feelings is a cognitive skill that undergoes a developmental process. The authors described five 'levels of emotional awareness' that develop during affect development following an epigenetic sequence. They propose that the degree to which an individual is aware of his or her emotions is paralleled by the complexity of cognitive schemata for processing emotional information. Less complex cognitive schemata constrain the experience of emotional reactions to the experience of somatic sensations or action tendencies only, whereas more complex cognitive schemata are associated with the ability to elaborate emotional arousal in feelings that are consciously felt and to experience blends of emotions. In light of Lane's cognitive-developmental model somatization may be conceived as a developmental deficit that is associated with lower levels of emotional awareness involving undifferentiated emotional arousal with a focus on bodily sensations. Whereas in Lane's model somatization is linked to a deficit in elevating procedural representations of emotions onto a conceptual level, Bucci (1997b) has proposed, that somatization results from a dissociation among the sub-symbolic and symbolic components of the emotion schemas. According to Bucci's 'multiple code theory' emotions are represented in the multiple channels of the non-verbal system and in verbal form. Non-verbal processing of emotions includes sub-symbolic processing forms (involving sensory, somatic, visceral, and motoric modalities) and symbolic processing forms (imagery). Bucci suggests that disconnections between sub-symbolic and symbolic schemata of varying degrees of severity may result in isolated somatic and motor arousal patterns that are activated without cognitive activation during emotional arousal. This deficit in cognitive regulation is likely to result in prolonged physical activation and might be associated with the development of psychosomatic illness.

Although theory and research relating to affect regulation and psychosomatic illness have considerably advanced over the past 25 years, the pathways by which disturbances of emotion regulation contribute to somatic complaints is not yet fully understood. An essential assumption underlying alexithymia theory is that the failure to experience complex emotional states is associated with exaggerated or dysregulated autonomic activation. However, empirical findings of experimental studies exploring this hypothesis have been contradictory (Taylor & Bagby, 2004). Whereas the association between alexithymia and dysregulated autonomic activation remains unclear, several studies have yielded evidence that alexithymia may contribute to somatic symptoms by affecting illness behaviour through cognitive and social mechanisms (Lumley, Stettner, & Wehmer, 1996).

Another possible explanation for why affect dysregulation is expected to influence somatic illness is that emotional expression is inversely related to physiological arousal (Buck, 1980; Pennebaker, Hughes, & O'Heeron, 1987). Pennebaker, for example, has proposed in his inhibition (or disclosure) model (Pennebeker, 1989), that the non-expression of traumatic memories or upsetting experiences produces physiological strain and, over time, is likely to increase the risk of stress-related illness. Emotional disclosure, on the other hand, is thought to have beneficial health effects. The validity of Pennebaker's inhibition model has been demonstrated in various studies. Avoidant coping such as repression has been associated with increased cardiovascular reactivity (King, Taylor, & Albright, 1990), increased plasma lipids (Niaura, Herbert, & McMahon, 1992) and reduced cellular immune competence (Esterling, Antoni, & Kumar, 1990). Conversely, emotional expression by means of talking or writing has been shown to have clear health and behavioural effects (Smyth, 1998). Numerous writing-disclosure studies found that the expression of emotions is linked to improvements in physiological functioning, better psychological well-being, fewer physician (clinic) visits and lower medication use (see Pennebaker & Seagal, 1999, for a recent review). As Pennebaker has recently suggested, the most deleterious effects of inhibition is that it interferes with the cognitive processing of upsetting emotional experiences, thus impeding the transduction of implicit (sensory-affective) memories into an organized, verbal format (Pennebaker & Seagal, 1999). In this view, the beneficial effect of emotional expression by means of writing and talking is that it serves to form a narrative, thereby organizing complex emotional experiences. Although contemporary theories and conceptualizations of inhibition (or disclosure) are becoming increasingly sophisticated, several authors have pointed to the need to take into consideration moderator variables of the inhibition-health relationship (Consedine, Maggai, & Bonanno, 2002; Lumley, 2004).

Empirical studies of affect regulation and somatoform disorders

In this section, we will review data linking affect regulation with somatoform disorders. We will specifically focus on two important affect regulation strategies. The first is an individual's ability to be aware of his or her emotions, to identify them and

differentiate them from physiological states; the second is whether an individual habitually expresses or inhibits emotions. Both affect regulation strategies are part of the multidimensional construct of alexithymia that is currently conceptualized as a personality trait marked by difficulties in the identification and communication of affects and an externally oriented cognitive style (Taylor et al., 1997). A large literature within alexithymia theory deals with the role of alexithymia in a variety of clinical conditions, including somatoform disorders. There is also a body of research not rooted in the alexithymia theory that has focused on the above-mentioned affect regulation processes and has linked them to somatic complaining. We must emphasize, however, that we will not examine all possible affect regulation strategies or emotion-related concepts that have been proposed to play a role in the experience of somatoform symptoms. A complete review of the literature goes beyond the scope of the present paper.

Most evidence supporting associations between affect regulation and somatoform disorders or somatization comes from alexithymia research (De Gucht & Heiser, 2003). Some of these studies assessed alexithymia in patients with somatoform disorders, whereas other studies explored the relationship between alexithymia and self-reported somatic symptoms. In nearly all of these studies alexithymia was assessed with a self-report instrument, the Toronto Alexithymia Scale (TAS) (Bagby, Parker, & Taylor, 1994a; 1994b). The TAS-20 assesses three components of the alexithymia construct: (1) difficulty identifying feelings; (2) difficulty describing feelings; and (3) externally oriented thinking. To date, the TAS-20 is regarded as the best validated instrument to measure alexithymia.

A recent meta-analysis by De Gucht and Heiser (2003) has revealed a small to moderate association between alexithymia and different self-report measures of somatization (e.g., health complaint scales; reflect = 0.23). The existing studies examining alexithymia in patients with somatoform disorders have yielded generally consistent evidence of increased levels of alexithymia in somatoform disorders. In two earlier studies using alexithymia as a dichotomous construct, a high prevalence of alexithymia was found in patients with chronic pain (Cox, Kuch, Parker, Shulman, & Evans, 1994; Millard & Kinsler, 1992). Millard and Kinsley (1992) reported a prevalence of about one-third and Cox et al., (1994) a prevalence of 53% of alexithymia in chronic pain patients. Other studies reported increased levels of alexithymia in somatoform disorders as compared to healthy controls (Fernandez, Siram, Rajkumar, & Chadrasekar, 1989; Porcelli, Zaka, Leoci, Centone, & Taylor, 1995; Sriram, Chatuverdi, Gopinath, & Shanmugam, 1987; Waller & Scheidt, 2004). Patients with somatoform disorders were also found to show elevated alexithymia scores, when compared to medically ill patients (Bach & Bach, 1996; Kooiman, Bolk, Brand, Trijsburg, & Rooijmaans, 2000; Lumley, Asselin, & Norman, 1997). However, most of the studies examining TAS-20 scores in somatoform disorder patients as compared to psychiatric patients have shown no statistically significant differences in TAS-20 alexithymia scores (Cohen, Auld, & Brooker, 1994; Kosturek, Gregory, Sousou, & Trief, 1998; Šubić-Wrana et al., 2002).

The latter result gives rise to the critical question of how specific the findings regarding alexithymia in patients with somatoform disorders are. Of particular interest in this regard is a finding that has been recently reported by Šubić-Wrana and colleagues (2002; 2005). The authors used the TAS-20 in combination with a performance-based measure (LEAS: Levels of Emotional Awareness Scale; Lane, Quinlan, Schwartz, Walker, & Zeitlin, 1990) to assess alexithymia in different groups of psychopathological disorders. The study found that scores on the LEAS, but not on the TAS-20, differentiated between patients with somatoform disorders and patients with various psychiatric disorders. In addition, it was found that specifically those somatoform disorder patients with low emotional awareness scores on the LEAS (e.g., alexithymics) rated themselves as having low impairments on all of the self-report-measures applied in this study, including the TAS-20. Several authors have questioned in this regard as to whether self-report ratings on the TAS-20 might be accurate in subjects with severe impairments in emotional self-awareness (Lane, Sechrest, & Riedel, 1998). It is conceivable, that some people may simply lack insight into their true ability of processing and expressing emotions. The author as well as the creators of the TAS therefore recommended that studies be conducted using multiple alexithymia measures. To date, studies comparing the TAS-20 with non-self-report measures of alexithymia are few in number.

Additional findings of interest have been obtained in those studies that considered the three factors of the TAS-20 separately. According to our own data, only TAS-20 factor 'difficulty identifying feelings' and not the other two TAS-20 factors ('difficulty describing feelings'; 'externally oriented thinking') was associated with somatoform disorders (Waller & Scheidt, 2004). The same factor was significantly different in patients with somatoform disorders when compared with medically ill patients (Bach & Bach, 1996; Kooiman et al., 2000). In a recent study by Bankier et al., (2001), TAS-20

factor 'difficulty identifying feelings' was significantly associated with somatoform disorders and depression, whereas other psychiatric disorders showed elevations in one of the other factors of the TAS-20. As such, it seems that patients with somatoform disorders judge themselves as having a particularly limited capacity to identify their emotions and differentiate them from bodily sensations. It must be noted, however, that the interpretation of data concerning the link between TAS-20 factor 'difficulties in identifying feelings' and somatization is complicated by the insufficient attention that has been given to the overlap of the TAS-20 with negative emotional distress. Several studies found that the TAS-20 factors 'difficulties in identifying feelings' and 'difficulties in describing feelings' correlated with depression and anxiety (Hendryx, Haviland, & Shaw, 1991; Wise, Mann, Mitchell, Hryvniak, & Hill, 1990). However, recent studies have demonstrated that the significant relation between 'difficulty describing feeling' and somatoform disorders remained after negative affectivity was partialled out (De Gucht, Fischler, & Heiser, 2004; Waller & Scheidt, 2004). Further support for a specific proneness to the experience of undifferentiated affects in somatoform disorders was provided in our own research. We (Waller & Scheidt, 2004) found a low level of affect awareness on a non-self report measure (ACI: Affect Consciousness Interview; Monsen, Eilersten, Melgård, & Ødegård, 1996) in patients with somatoform disorders. The same result was found in a study with chronic pain patients (Monsen, K. & Monsen, J. T., 2000). Low AC levels on awareness indicate that patients, when questioned as to how they experience emotions, describe states of tension and unease rather than distinct and separate emotions. Furthermore, instead of localizing their emotions in the psychic domain or in their body, they focus on external events or actions.

Taken together, the work on alexithymia in somatoform disorders support the proposal that patients with somatoform disorders have substantial difficulties in elaborating on their emotions; they are poorly able to link their feelings with accompanying bodily sensations, motor activity or fantasies. The somatic sensations associated with emotional arousal may then be amplified and misinterpreted as symptoms of disease. In contrast, the association between somatoform disorders and avoidance or disability of expressing feelings is less clear, at least according to findings obtained with the TAS-20.

The question whether patients with somatoform disorders habitually express or inhibit emotions has also been addressed in the context of other research fields, including inhibition-health research. Most of these studies investigated emotional expression in patients with chronic pain. Overall, the findings from this research indicate that avoidance or inhibition of expressing conflicting emotions is a characteristic feature of patients suffering from chronic pain conditions (Pilowsky & Spence, 1976; Raphael, Marbach, & Gallagher, 2000; Spence, Pilowsky, & Minniti, 1985/86). In addition, inhibited anger in patients with chronic pain has been found to be negatively related to adjustment (Pilowsky & Spence, 1976). Suppression of anger has also been shown prominent in patients with psychogenic excoriation (Çalikusu, Yücel, Polat, & Baykal, 2002). We (Waller & Scheidt, 2004) found that patients with somatoform disorder have more difficulties in non-verbally expressing their emotions than healthy controls. It is important to note here that most of the studies examining emotion expression in somatoform disorder patients relied on self-report measures. To date, Steimer-Krause, Krause and Wagner (1990) have reported the most comprehensive study of the link between psychosomatic conditions and emotion expression. In this explorative study, facial expressions of patients with psychosomatic disorder were observed during dyadic interactions with healthy controls. Specifically, affect expression was investigated in relation to its regulatory influence on social interactions. The study found a general reduction of mimic production and mimic variability in the psychosomatic patient group, which was paralleled by a reduction of mimic production in their healthy partners. Moreover, a reduction of social smiling was found in the patient group. The most prominent facial expression in patients with colitis ulcerosa was 'disgust'. It must be noted, however, that the reduced pattern of mimic affect expression was also observed in a sample of schizophrenic patients. A recent study has found an increase in negative facial expressions, especially contempt, in patents with somatoform pain disorder (Merten & Brunnhuber, 2004). These studies are important, because they clarify the extent to which inhibited facial expression or increase in facial display of distinct emotions is related to communication difficulties in interpersonal relationships.

Aetiology of dysregulated affects in somatoform disorders: An attachment perspective

Attachment researchers have assigned increasing importance to the effects of early attachment relationships on the development of affect regulation strategies. This developmental perspective on affect regulation is based on findings from infant research demonstrating the important regulatory function of the primary caregiver in modulating the infant's

emotional states (Beebe & Lachmann, 1988; Stern, 1985).

Attachment theorists have proposed several theoretical explanations for why early attachment may be linked to emotion regulation. Cassidy, for example, has suggested that the child's way of regulating his or her affects serves to maintain the attachment relationship (Cassidy, 1994). In general, emotional expression—especially the expression of negative affects—is an important signal in order to receive support and care from parents. Children with secure attachment have usually experienced a sensitive, protective and emotionally accessible attachment figure. They have learned to rely on the caregivers' responsiveness in times of distress. Based on these experiences they are thought to develop open, flexible emotion expression. By contrast, children with an insecure attachment history have learned that their needs will not be met. Thus they have developed secondary attachment strategies according to this expectation. Current attachment theory postulates two basic insecure attachment strategies involving the efforts to play down (insecure dismissing) or amplify (insecure preoccupied) the expression of distress and attachment needs (Kobak, Cole, Ferenz-Gilles, Fleming, & Gamble, 1993). A preoccupied state of mind is associated with an over-amplification of the attachment and wariness system (Cassidy, 1994). Thus, the expression of attachment needs and negative emotions is heightened even in low-threat situations in an effort to keep significant others close or entangled. The opposite of the preoccupied dimension, the dismissing attachment strategy, is associated with deactivation of the attachment system. Avoidant children develop a style of affect behaviour that is based on minimizing affect expression and masking of negative emotions. Consistent with these theoretical formulations, empirical research has shown that insecurely attached infants, specifically those with an avoidant attachment status, fail to express negative emotion in situations, in which they are emotional distressed (Ainsworth, Blehar, Waters, & Wall, 1978; Lütckenhaus et al., 1985). Observations during the Strange Situation (Ainsworth et al., 1978) showed that the non-expression of emotional arousal of infants with avoidant attachment in response to separation is accompanied by high levels of salivary cortisol. Several studies of the Regensburger research group reported similar findings for adolescents (Becker-Stoll, Delius, & Scheitenberger, 2001; Spangler & Zimmermann, 1999; Zimmermann, Maier, Winter, & Grossmann, 2001). It was found that attachment security was related to open non-verbal expression of emotions, whereas a dismissing attachment status was associated with inhibition of emotional expression. In addition, the study of Spangler and Zimmermann (1999) has shown that the mimic responses of dismissing adolescents to negative emotional stimuli did not correspond to their self-reported emotional experience. According to the authors, this finding seems to indicate a decoupling of the explicit and implicit procedural appraisal systems for negative stimuli.

A largely unconscious form of affect regulation that occurs within attachment relationships is described in the work of Hofer with rodent pups (Hofer, 1995; Polan & Hofer, 1999). In an impressive series of experiments Hofer demonstrated that the infant's physiological and behavioural systems are regulated by interactions with caregivers. In the light of Hofer's work on the biobehavioural mechanisms underlying attachment, disturbances in early attachment relationships may be expected to have long-term effects on the regulation of physiological processes.

Other attachment theorists like Fonagy and colleagues (Fonagy, Gergely, Jurist, & Target, 2002) proposed that variation in the capacity of the caregiver to adequately mirror the child's affective states brings about variation in the child's capacity to represent, tolerate and regulate affects. Maladaptive affective-regulative interactions within an insensitive attachment context may result in an impaired capacity of the child to form accurate secondary representations of undifferentiated affect states, which in turn promotes deficits in the processing, tolerance and verbalization of emotions. After the first year of life the quality of the caregiver's verbal dialogue about mental states (and particularly about emotions) has an effect on children's ability verbally to represent and talk about emotions (Harris, 1999; Nelson, 1999). Numerous studies within the field of attachment research provided evidence for these assumptions. In a recent prospective study Lemche, Klann-Delius, Koch, and Joraschky (2004) has shown that insecure-avoidant attached and disorganized infants either completely fail or have a time lag in the acquisition of vocabulary referring to emotional states or to cognitive processes. In contrast, children with secure attachment easily acquired internal state language. In other recent attachment research relationships between attachment status and understanding of emotions emerged; attachment security was found to be related to the understanding of negative emotions in other persons (De Rosnay & Harris, 2002; Laible & Thompson, 1998), to the capacity to coherently discuss emotional themes (Leibowitz, Ramos-Marcuse, & Arsenio (2002) and to the reference to emotions while discussing conflictual attachment themes (Laible & Thompson, 2000). In addition, attachment security at 12 months of age was found to predict the capacity to understand mixed emotions

at age 6 (Steele, H., Steele, M., Croft, & Fonagy, 1999). Associations between attachment status and the capacity to represent affects have also been reported for adults; there is evidence from several studies that insecure attachment is related to alexithymia (Blumberg, 1997; Montebarocci, Codispoti, Baldaro, & Rossi, 2004; Scheidt et al., 1999; Troisi, D'Argenio, Peracchio, & Petti, 2001; Waller, E., Scheidt, & Waller, N., in prep.). The theoretical assumption of a specific link between dismissing attachment and alexithymia was supported only in those studies relying on the scoring system of Main (Main & Goldwyn, 1985–1996) for attachment classification (Blumberg, 1997; Buchheim & Mergenthaler, 2000; Scheidt et al., 1999; Waller et al., in prep.). There is also evidence from several other studies that dismissing attachment is clearly linked to defensive forms of affect regulation (Dozier & Kobak, 1992; Fraley, Garner, & Shaver, 2000; Mikulinker & Orbach, 1995; Zeijlmans van Emmichoven, van IJzendoorn, De Ruiter, & Brosschot, 2003).

Taken together, the empirical findings from attachment research indicate that variation in attachment patterns are linked to variation in affect regulation styles. The empirical research discussed below indicate that a dismissing status of attachment is linked to the disability or to defensive forms of processing and expressing emotions, whereas attachment security is associated with open, flexible affect expression and the ability to explore and process emotional experiences without employing defensive strategies. It must be noted, however, that most evidence supporting associations between attachment and affect regulation comes from cross-sectional research.

It is only recently that researchers are beginning to investigate attachment and affect regulations in clinical populations, including somatoform disorders. A developmental view of somatoform disorders is in agreement with recent findings of a high incidence of personality disorders (Noyes et al., 2001) and of childhood adversity in this clinical condition (Craig, Boardman, Mills, Daly-Jones, & Drake, 1993). In our own research a high proportion of insecure dismissing attachment in somatoform disorders was found (Waller, Scheidt, & Hartmann, 2004). About 50% of somatoform disorder patients were classified as insecure dismissing, about 25% percent as insecure preoccupied and only 25% were classified as secure. Moreover, the degree to which somatoform disorder patients employ dismissing attachment strategies has been shown to be strongly predictive of deficits in affect awareness and of an external oriented style of thinking (Waller et al., in prep.). A similar finding was already reported in the study of Scheidt et al. (1999) that has investigated attachment and alexithymia in a sample of patients with idiopathic spasmodic torticollis. These findings seem to indicate that deficits in affect regulation are not a general feature of somatoform disorders, but rather characterize a special subgroup of these patients, namely those who rely on dismissing attachment strategies. Longitudinal studies are needed to clarify the relationship between developmental roots of attachment representation and the clinically described disturbances of affect regulation in later life.

Treatment considerations

It is generally held that patients with somatoform disorders are difficult to treat. Problems in the treatment relationship largely result from their pattern of help-seeking behaviour that involves rejecting of help while in the same time keeping health professional entangled through persistent complaints about bodily symptoms. Clinical observations indicate that patients with somatoform disorder respond poorly to traditional insight-oriented forms of psychotherapy, due to their lack of introspectiveness and emotional awareness. Given that somatoform disorders are linked to restricted emotional awareness, we suggest that interventions should be aimed at enhancing emotional awareness.

In the literature some alternative psychotherapeutic approaches for persons who lack emotional awareness (e.g., alexithymics) have been described. Lane and Pollermann (2002), for example, have proposed that these patients need assistance in transforming less complex emotional schemata which are dominated by sub-symbolic components into more complex mental representations of emotional states. According to the authors, this requires patients to 'develop an appreciation of what different emotions feel like, how they differ from one another, what kinds of situations bring them on in general, the external indicators of those states, the factors that amplify or attenuate them, the behavioural and mental actions that can be taken to modify the intensity of such states, and the proper handling of such states' (Lane and Pollermann, 2002). Bucci (1997b) has suggested that focus on somatic symptoms may be the first step in linking sub-symbolic to symbolic components of the emotion schemata. In addition, the literature suggests that non-verbal psychotherapeutic techniques are helpful in enhancing emotional awareness and emotion differentiation. Other authors have suggested interventions that focus on educating patients about their emotions along with fostering emotional experience and helping the patient to develop better emotional skills (Krystal, 1979;

Levant, 1998). These approaches differ substantially from traditional psychodynamic psychotherapy. However, the issue of modified psychotherapeutic interventions for patients with deficits in emotion regulation remains poorly explored. Most evidence with regard to the effectiveness of these interventions is casuistic in nature. Likewise, only a small number of treatment outcome studies explored the effects of interventions designed to enhance emotional awareness in somatoform disorder.

Monsen, K. and Monsen, J. T. (2000) investigated whether psychodynamic body therapy can improve emotional awareness and pain in chronic pain patients. Forty patients were randomly assigned to either individual psychodynamic body therapy (33 sessions on average) or a control treatment (treatment as usual or no treatment). The treatment in the therapy group consisted of psychological interventions and bodily techniques that focus on the exploration of affect experiences and affect expression. The study found that the therapy group improved significantly more than the control group on measures of affect awareness, subjective experience of pain, psychological symptoms and interpersonal problems. At the one-year follow-up, the effect has been shown to remain stable. Another controlled treatment outcome study examined the benefits of expressive therapies on pain and psychological symptoms in chronic pain patients (Beutler, Daldrup, Engle, & Oro'-Beutler, 1987). Although symptoms of depression decreased during treatment, there was no improvement in pain levels.

Several controlled intervention studies have examined the effects of emotional disclosure or expression in patients with somatoform disorders or with somatizing symptoms. Talking about emotionally important events was found to have no effect on use of medical services, subjective health, or sick leave in somatizing patients in general practice (Schilte et al., 2001). Lumley (2004) recently reviewed a number of controlled intervention studies that investigated the health effects of expressive writing in several samples of somatizing patients or patients with medical illness. Overall, the disclosure studies of Lumley's research group found only limited main effects. In view of that, the data of the disclosure studies were reanalyzed with the aim of identifying individual difference moderators of the effects of expressive writing. According to the data reported by Lumley (2004), there was strong evidence that alexithymia predicted less benefit of disclosure in samples of individuals with chronic health problems (e.g., patients with rheumatoid arthritis, women with chronic pelvic pain, students with migraine, students with high levels of physical symptoms). These findings indicate that instructions to only talk or write about negative emotional experiences are not sufficient for people with impairments in emotional self-awareness. This is not surprising, because there can be little doubt that alexithymic people will not succeed in translating their distress into language and form a coherent narrative about their negative emotional experiences. Furthermore, we would expect that activation of trauma-related emotional experience that occurs out of a supportive interpersonal context, may rather lead to repetition than to the reorganization of negative emotional experiences. Bucci (1997a) has pointed out that reorganization of negative emotional schema in lasting ways must proceed in an interactive way and ideally in the context of a secure treatment relationship. However, researchers have proposed that writing about emotional experiences could be a useful accompaniment to psychotherapy for patients with deficits in emotional awareness such as patients with somatoform disorders (Nickel & Egle, 1999).

Further empirical studies are needed to investigate for whom and to what extent emotion-focused interventions may reduce the vulnerability to high levels of emotional and somatic distress.

Conclusion

The study of affect regulation and its relation to health and illness has made significant advances over the past three decades. This paper has considered the role of disturbances in affect regulation in the development and course of somatoform disorders. Our review of the current literature has revealed that somatoform disorders involve deficits in the regulation of emotions in which the cognitive processing of emotions is impaired and the expression of emotion is either inhibited or increased in some specified ways. It must be noted, however, that most of the reviewed research has focused on the over-regulation of affects in somatoform disorders, leaving questions with respect to the under-regulation of emotions in these conditions unanswered. Given that a large percentage of patients with somatoform disorders are characterized by high levels of negative emotional distress, it seems likely that the absence of structure for regulation of affects may be a central feature of at least a subgroup of these patients. In addition, it is important to note that evidence of deficits in affect regulation have not been reported exclusively for somatoform disorders (see Taylor et al. 1997, for a recent review). One of the critical questions needing further study then is in which specific ways could deficits in affect regulation contribute to the experience of somatic complaints and to illness behaviour. To date, multiple pathways have been investigated

at different levels—neurobiological, psychophysiological, cognitive and behavioural. Even though there is a large amount of research in this area, the mechanisms are not yet fully understood. However, the question whether further research may fully uncover these mechanisms or not is dependent on the accuracy of the measures used to assess emotion regulation. As mentioned earlier, most of the studies on affect regulation in somatoform disorders relied on self-report measures, thus putting up with the inaccuracy of self-report ratings in subjects with impairments in emotional self-awareness. We therefore appreciate that new and promising non-self-report measures of emotion-related constructs have recently been introduced.

Our review has also addressed the central issue of the aetiology of affect dysregulation in somatoform disorders. As we have outlined, attachment theory seems to be especially useful in addressing this issue. Studies within the framework of attachment theory have provided clear evidence that insecure attachment patterns, and in particular an insecure-dismissing attachment pattern, are associated with an avoidant style of affect regulation. However, the application of attachment theory concepts and methods in psychosomatic medicine are still at an early stage. To recapitulate, there is now preliminary evidence of a high proportion of dismissing attachment in somatoform disorders. There is also recent evidence that restricted emotional awareness is not a general feature of somatoform disorders, but rather characterizes a special subgroup of these patients, namely those who rely on dismissing attachment strategies. The lack of longitudinal work in this area, however, leaves many questions unanswered.

We have outlined some implications of the reviewed research for psychotherapeutic interventions in patients with somatoform disorders. There is general agreement that somatoform disorders are difficult to treat. These patients often seem quite resistant to treatment mainly due to their lack of emotional awareness and interpersonal difficulties. However, there has been little research to evaluate treatments designed to restore disturbed affect regulation in somatoform disorders. Given the high proportion of dismissing attachment in somatoform disorders, we assume that forming a good working alliance and finding ways into affective experience may pose an explicit challenge to psychotherapy in these patients. Confronted with dismissingly attached patients, the clinicians' task is to understand the function of these attachment strategies as they help to defend the patient from intolerable feelings. This may help clinicians to respond to these patients in a way not consistent with their patients' lifelong expectations and experiences in relational contexts.

References

Ainsworth, M. D. S., Blehar, M., Waters, E., & Wall, S. (1978). *Patterns of attachment*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Alexander, F. (1950). *Psychosomatic medicine. Basics and fields of application*. London: Allen & Urwin.

Bach, M., & Bach, D. (1996). Alexithymia in somatic disease: A comparative study. *Psychotherapy and Psychosomatics*, *65*, 150–152.

Bagby, R. M., Parker, J. D. A., & Taylor, G. J. (1994a). The Twenty-Item Toronto Alexithymia Scale I. Item selection and cross validation of the factor structure. *Journal of Psychosomatic Research*, *38*, 23–32.

Bagby, R. M., Taylor, G. J., & Parker, J. D. A. (1994b). The Twenty-Item Toronto Alexithymia Scale II. Convergent discriminant, and concurrent validity. *Journal of Psychosomatic Research*, *38*, 33–40.

Bankier, B., Aigner, M., & Bach, M. (2001). Alexithymia in DSM-IV disorders. *Psychosomatics*, *43*, 235–240.

Bass, C., & Murphy, M. (1995). Somatoform and personality disorders: Syndromal comorbidity and overlapping developmental pathways. *Journal of Psychosomatic Research*, *39*, 403–427.

Becker-Stoll, F., Delius, A., & Scheitenberger, S. (2001). Adolescents' non-verbal emotional expression during negotiation of a disagreement with their mothers: An attachment approach. *International Journal of Behavioral Development*, *25*, 344–353.

Beebe, B., & Lachmann, F. M. (1988). The contribution of mother-infant mutual influence to the self and object representations. *Psychoanalytic Psychology*, *5*, 305–337.

Beutler, L. E., Daldrup, R. J., Engle, D., & Oro'-Beutler, M. E. (1987). Effects of therapeutically induced affect arousal on depressive symptoms, pain and beta-endorphins among rheumatoid arthritis patients. *Pain*, *20*, 325–334.

Blumberg, P. (1997). *Attachment and the organization of affective experience*. Dissertation, University of Michigan.

Bridges, K. W., & Goldberg, D. P. (1985). Somatic presentation of DSM III psychiatric disorders in primary care. *Journal of Psychosomatic Research*, *29*, 563–569.

Bucci, W. (1997a). *Psychoanalysis and Cognitive Science*. New York: The Guilford Press.

Bucci, W. (1997b). Symptoms and symbols: A multiple code theory of somatization. *Psychoanalytic Inquiry*, *17*, 151–172.

Buchheim, A., & Mergenthaler, E. (2000). The relationship among attachment representation, emotion-abstraction patterns, and narrative style: A computer-based text analysis of the adult attachment interview. *Psychotherapy Research*, *10*, 390–407.

Buck, R. (1980). Nonverbal behavior and the theory of emotion: The facial feedback hypothesis. *Journal of Personality & Social Psychology*, *38*, 811–824.

Çalikusu, C., Yücel, B., Polat, A., & Baykal, C. (2002). Expression of anger and alexithymia in patients with psychogenic excoriation. *A preliminary report. International Journal of Psychiatry in Medicine*, *32*, 345–352.

Cassidy, J. (1994). Emotion regulation: Influences of attachment relationships. *Monographs of the Society for Research in Child Development*, *59*, 228–249.

Cohen, K., Auld, F., & Brooker, H. (1994). Is alexithymia related to psychosomatic disorder and somatizing. *Journal of Psychosomatic Research*, *38*, 119–127.

Consedine, N. S., Maggai, C., & Bonanno, G. A. (2002). Moderators of the emotion inhibition-health relationship: A review and research agenda. *Journal of General Psychology*, *6*, 204–238.

Cox, B. R., Kuch, K., Parker, J. D. A., Shulman, I. D., & Evans, R. J. (1994). Alexithymia in somatoform disorder patients with chronic pain. *Journal of Psychosomatic Research*, *38*, 523–527.

Craig, T. K. J., Boardman, A. P., Mills, K., Daly-Jones, O., & Drake, H. (1993). The South London somatisation study I: Longitudinal course and the influence of early life experiences. *British Journal of Psychiatry*, *163*, 579–588.

Damasio, A. R. (1999). *The feeling of what happens: Body and emotion in the making of consciousness*. San Diego: Harcourt.

De Gucht, V., Fischler, B., & Heiser, W. (2004). Neuroticism, alexityhmia, negative affect, and positive affect as determinants of medically unexplained symptoms. *Personality and Individual Differences*, *36*, 1655–1667.

De Gucht, V., & Heiser, W. (2003). Alexithymia and somatisation. A quantitative review of the literature. *Journal of Psychosomatic Research*, *54*, 425–434.

De Rosnay, M., & Harris, P. L. (2002). Individual differences in children's understanding of emotion: The role of attachment and language. *Attachment & Human Development*, *4*, 39–54.

Dodge, K. A., & Garber, J. (1991). Domains of emotion regulation. In J. Garber & K. A. Dodge (Eds), *The development of emotion regulation and dysregulation* (pp. 3–11). New York: Cambridge University Press.

Dozier, M., & Kobak, R. (1992). Psychophysiology in adolescent attachment interviews: Convergent evidence for deactivating strategies. *Child Development*, *63*, 1473–1480.

Esterling, B. A., Antoni, M. H., & Kumar, M. (1990). Emotional repression, stress disclosure responses, and Epstein-Barr viral capsid antigen titers. *Psychosomatic Medicine*, *52*, 397–410.

Fernandez, A., Siram, T. G., Rajkumar, S., & Chadrasekar, A. N. (1989). Alexithymic characteristics in rheumatoid arthritis: A controlled study. *Psychotherapy and Psychosomatics*, *51*, 45–50.

Fonagy, P., Gergely, G., Jurist, E. L., & Target, M. (2002). *Affect regulation, mentalization, and the development of the self*. New York: Other Press.

Fraley, R. C., Garner, J. P., & Shaver, P. R. (2000). Adult attachment and the defensive regulation of attention and memory: Examining the role of pre-emptive and post-emptive defensive processes. *Journal of Personality & Social Psychology*, *79*, 816–826.

Gross, J. J., & Muñoz, R. F. (1995). Emotion regulation and mental health. *Clinical Psychology: Science & Practice*, *2*, 151–164.

Harris, P. L. (1999). Individual differences in understanding of emotions: The role of attachment status and psychological discourse. *Attachment & Human Development*, *1*, 307–324.

Hendryx, M. S., Haviland, M. G., & Shaw, D. G. (1991). Dimensions of alexithymia and their relationships to anxiety and depression. *Journal of Personality Assessment*, *56*, 227–237.

Hofer, M. A. (1995). Hidden regulators: Implications for a new understanding of attachment, separation, and loss. In S. Goldberg, R. Muir & J. Kerr (Eds.), *Attachment theory: Social, developmental, and clinical perspectives* (pp. 203–230). Hillsdale, NJ: Analytic Press.

Kellner, R. (1990). Somatization Theories and research. *Journal of Nervous and Mental Diseases*, *178*, 150–160.

King, A. C., Taylor, C. B., & Albright, C. A. (1990). The relationship between repressive and defensive coping styles and blood pressure responses in healthy, middle-aged men and women. *Journal of Psychosomatic Research*, *34*, 461–471.

Kobak, R. R., Cole, H. E., Ferenz-Gilles, R., Fleming, W. S., & Gamble, W. (1993). Attachment and emotion regulation during mother-teen problem solving: A control theory analysis. *Child Development*, *64*, 221–245.

Kooiman, C. G., Bolk, J. H., Brand, R., Trijsburg, R. W., & Rooijmaans, H. G. M. (2000). Is alexithymia a risk factor for unexplained physical symptoms in general medical outpatients?. *Psychosomatic Medicine 62*, 768–778.

Kosturek, A., Gregory, R. J., Sousou, A. J., & Trief, P. (1998). Alexithymia and somatic amplification in chronic pain. *Psychosomatics*, *39*, 399–404.

Krause, R. (2004). Affekt, Schmerz, Konversion. In R. Sandweg (Ed.), *Chronischer Schmerz und Zivilisation. Organstörungen, psychische Prozesse und gesellschaftliche Bedingtheiten* (pp. 71–84). Göttingen: Vanderhoeck & Ruprecht.

Krystal, H. (1997). Desomatization and the consequences of infantile psychic trauma. *Psychoanalytic Inquiry*, *17*, 126–150.

Krystal, H. (1979). Alexithymia and psychotherapy. *American Journal of Psychotherapy*, *33*, 17–31.

Laible, D. J., & Thompson, R. A. (2000). Mother-child discourse, attachment security, shared positive affect, and early consciousness development. *Child Development*, *71*, 1424–1440.

Laible, D. J., & Thompson, R. A. (1998). Attachment and emotional understanding in preschool children. *Developmental Psychology*, *34*, 1038–1045.

Lane, R. D., & Pollermann, B. Z. (2002). Complexity of emotion representations. In L. F. Barrett & P. Salovey (Eds), *The wisdom in feeling: Psychological processes in emotional intelligence* (pp. 271–293). New York: The Guildford Press.

Lane, R. D., Quinlan, D. M., Schwartz, G. E., Walker, P. A., & Zeitlin, S. B. (1990). The Levels of Emotional Awareness Scale: A cognitive-developmental measure of emotion. *Journal of Personality Assessment*, *55*, 124–134.

Lane, R. D., & Schwarz, G. E. (1987). Levels of emotional awareness: A cognitive-developmental theory and its application to psychopathology. *American Journal of Psychiatry*, *144*, 133–143.

Lane, R. D., Sechrest, L., & Riedel, R. (1998). Socio-demographic correlates of alexithymia. *Comprehensive Psychiatry*, *39*, 377–385.

Le Doux, J. (1996). *The emotional brain*. New York: Simon and Schuster.

Leibowitz, J., Ramos-Marcuse, F., & Arsenio, W. F. (2002). Parent-child emotion communication, attachment and affective narratives. *Attachment & Human Development*, *4*, 55–67.

Lemche, E., Klann-Delius, G., Koch, R., & Joraschky, P. (2004). Mentalizing language development in a longitudinal attachment sample: Implications for alexithymia. *Psychotherapy and Psychosomatics*, *73*, 366–374.

Levant, R. F. (1998). Desperately seeking language: Understanding, assessing, and treating normative male alexithymia. In W. S. Pollack & R. F. Levant (Eds), *New Psychotherapy for men* (pp.35–56). New York: John Wiley & Sons.

Lipowski, Z. J. (1987). Somatization: The experience and communication of psychological distress as somatic symptoms. *Psychotherapy & Psychosomatics*, *47*, 160–167.

Lütkenhaus, P., Grossmann, K. E., & Grossmann, K. (1985). Infant-mother attachment at twelve month and style of attachment with a stranger at the age of three years. *Child Development*, *56*, 1538–1542.

Lumley, M. A. (2004). Alexithymia, emotional disclosure, and health: A program of research. *Journal of Personality*, *72*, 1271–1300.

Lumeley, M. A., Asselin, L. A., & Norman, S. (1997). Alexithymia in chronic pain patients. *Comprehensive Psychiatry*, *38*, 160–165.

Lumley, M. A., Stettner, L., & Wehmer, F. (1996). How are alexithymia and physical illness linked? A review and critique of pathways. *Journal of Psychosomatic Research*, *41*, 505–518.

Main, M., & Goldwyn, R. (1985–1996). *Adult attachment scoring and classification system. Unpublished scoring manual*. University of California at Berkeley, Department of Psychology.

Martin, J. B., & Pihl, R. O. (1985). The stress-alexithymia hypothesis: Theoretical and empirical considerations. *Psychotherapy & Psychosomatics*, *43*, 169–176.

Merten, J., & Brunnhuber, S. (2004). Facial expression and experience in emotion in psychodynamic interviews with patients suffering from a pain disorder. *Psychopathology*, *7*, 266–271.

Mikuliner, M., & Orbach, I. (1995). Attachment styles and repressive defensiveness: The accessibility and architecture of affective memories. *Journal of Personality and Social Psychology*, *68*, 917–925.

Millard, R. W., & Kinsler, B. L. (1992). Evaluation of constricted affect in chronic pain: An attempt using the Toronto Alexithymia Scale. *Pain*, *50*, 287–297.

Monsen, J. T., Eilersten, D. E., Melgård, T., & Ødegård, P. (1996). Affects and affect consciousness: Initial experience with the assessment of affect integration. *Journal of Psychotherapy Practice and Research*, *5*, 238–249.

Monsen, K., & Monsen, J. T. (2000). Chronic pain and psychodynamic body therapy: A controlled outcome study. *Psychotherapy: Theory, Research, Practice, Training*, *37*, 257–269.

Montebarocci, O., Codispoti, M., Baldaro, B., & Rossi, N. (2004). Adult attachment style and alexithymia. *Personality & Individual Differences*, *36*, 499–507.

Nelson, K. (1999). Event representation, narrative development, and internal working models. *Attachment & Human Development*, *1*, 239–251.

Nemiah, J. C., & Sifneos, P. E. (1970). Affect and fantasy in patients with psychosomatic disorders. In O. W. Hill (Ed.), *Modern trends in psychosomatic medicine, Vol. 2* (pp. 26–34). London: Butterworth Press.

Niaura, R., Herbert, P. N., & McMahon, N. (1992). Repressive coping and blood lipids in men and women. *Psychosomatic Medicine*, *54*, 698–706.

Nickel, R., & Egle, U. T. (1999). *Therapie somatoformer Schmerzstörungen. Manual zur psychodynamischen–interaktionellen Gruppentherapie*. Stuttgart: Schattauer.

Noyes, R. J., Langbehn, D. R., Happel, R. L., Stout, L. R., Muller, B. A., & Longley, S. L. (2001). Personality dysfunction among somatizing patients. *Psychosomatics*, *42*, 320–329.

Pennebaker, J. W. (1989). Confession, inhibition, and disease. In L. Berkowitz (Ed.), *Advances in experimental social psychology, Vol. 22* (pp. 211–244). Orlando, FL: Academic Press.

Pennebaker, J. W., Hughes, C. F., & O'Heeron, R. C. (1987). The psychophysiology of confession: Linking inhibitory and psychosomatic processes. *Journal of Personality & Social Psychology*, *52*, 781–793.

Pennebaker, J. W., & Seagal, J. D. (1999). Forming a story: The health benefits of narrative. *Journal of Clinical Psychology*, *55*, 1243–1254.

Pilowsky, L., & Spence, N. D. (1976). Pain, anger, and illness behavior. *Journal of Psychosomatic Research*, *20*, 411–416.

Polan, H. J., & Hofer, M. A. (1999). Psychobiological origins of infant attachment and separation responses. In J. Cassidy & P. R. Shaver (Eds), *Handbook of attachment: Theory, research, and clinical applications* (pp. 162–180). New York: Guilford Press.

Porcelli, P., Zaka, S., Leoci, C., Centone, S., & Taylor, G. J. (1995). Alexithymia in inflammatory bowel disease. *Psychotherapy & Psychosomatics*, *64*, 49–53.

Raphael, K. G., Marbach, R. M., & Gallagher, R. M. (2000). Somatosensory amplification and affective inhibition are elevated in myofascial face pain. *Pain Medicine*, *1*, 247–253.

Scheidt, C. E., Waller, E., Schnock, C., Becker-Stoll, F., Zimmermann, P., & Wirsching, M. (1999). Alexithymia and attachment representation in Torticollis Spasmodicus. *Journal of Nervous and Mental Disease*, *187*, 47–52.

Schilte, A. F., Portegijs, P. J. M., Blankenstein, A. H., van der Horst, H. E., Latour, M. F. F., van Eijk, J. Th. M., & Knottnerus, A. (2001). Randomised controlled trial of disclosure of emotionally important events in somatization in primary care. *British Medical Journal*, *323*, 86–89.

Smyth, J. M. (1998). Written emotional expression: Effect size, outcome types, and moderating variables. *Journal of Consulting and Clinical Psychology*, *66*, 174–184.

Spangler, G., & Zimmermann, P. (1999). Attachment representation and emotion regulation in adolescence: A psychobiological perspective on internal working models. *Attachment & Human Development*, *1*, 270–290.

Spence, N. D., Pilowsky, I., & Minniti, R. (1985/86). The attribution of affect in pain clinic patients: A psychophysioligical study of the conversion process. *International Journal of Psychiatry in Medicine*, *15*, 1–11.

Sriram, T. G., Chatuverdi, S. K., Gopinath, P. S., & Shanmugam, V. (1987). Controlled study of alexithymic characteristics in patients with psychogenic pain disorder. *Psychotherapy and Psychosomatics*, *47*, 11–17.

Steele, H., Steele, M., Croft, C., & Fonagy, P. (1999). Infant-mother attachment at one year predicts children's understanding of mixed emotions at six years. *Social Development*, *8*, 161–178.

Steimer-Krause, E., Krause, R., & Wagner, G. (1990). Prozesse der Interaktionsregulierung bei schizophren und psychosomatisch erkrankten Patienten. *Studien zum mimischen Verhalten in dyadischen Interaktionen. Zeitschrift für Klinische Psychology*, *19*, 32–49.

Stern, D. N. (1985). *The interpersonal world of the infant*. New York: Basic Books.

Šubić-Wrana, C., Bruder, S., Thomas, W., Lane, R. D., & Köhle, K. (2005). Emotional awareness deficits in inpatients of a psychosomatic ward: A comparison of two different measures of alexithymia. *Psychosomatic Medicine*, *67*, 483–489.

Šubić-Wrana, C., Bruder, S., Thomas, W., Gaus, E., Merkle, W., & Köhle, K. (2002). Verteilung des Persönlichkeitsmerkmals Alexithymie bei Patienten in stationärer Psychosomatischen Behandlung – gemessen mit TAS-20 und LEAS. *Psychotherapie Psychosomatik Medizinische Psychologie*, *52*, 454–460.

Taylor, G. J., & Bagby, R. M. (2004). New trends in alexithymia research. *Psychotherapy & Psychosomatics*, *73*, 68–77.

Taylor, G. J., Bagby, R. M., & Parker, J. D. A. (1997). *Disorders of affect regulation: Alexithymia in medical and psychiatric illness*. Cambridge: University Press.

Thompson, R. A. (1994). Emotion regulation: A theme in search of definition. *Monographs of the Society for Research in Child Development*, *59*, 25–52.

Troisi, A., D'Argenio, A., Peracchio, F., & Petti, P. (2001). Insecure Attachment an alexithymia in young men with mood symptoms. *Journal of Nervous & Mental Disease*, *189*, 311–316.

Waller, E., & Scheidt, C. E. (2004). Somatoform disorders as disorders of affect regulation A study comparing the TAS-20 with non-self-report measures of alexithymia. *Journal of Psychosomatic Research*, *57*, 239–247.

Waller, E., Scheidt, C. E., & Hartmann, A. (2004). Attachment representation and illness behavior in somatoform disorders. *Journal of Nervous & Mental Disease*, *192*, 200–209.

Waller, E., Scheidt, C. E., & Waller, N. (in prep). Deficits in affect regulation and somatoform disorders: The role of dismissing attachment representations.

Watson, D., & Pennebaker, J. W. (1989). Health complaints, stress, and distress: Exploring the central role of negative affectivity. *Psychological Review*, *96*, 234–254.

Weinberger, D. A., Schwartz, G. E., & Davidson, R. J. (1979). Low-anxious, high-anxious, and repressive coping styles: Psychometric patterns and behavioral and physiological responses to stress. *Journal of Abnormal Psychology*, *88*, 369–380.

Wise, T. N., Mann, L. S., Mitchell, J. D., Hryvniak, M., & Hill, B. (1990). Secondary alexithymia: An empirical validation. *Comprehensive Psychiatry*, *31*, 284–288.

Zeijlmans van Emmichoven, I. A., van IJzendoorn, M. H., De Ruiter, C., & Brosschot, J. F. (2003). Selective processing of threatening information: Effects of attachment representation and anxiety disorder on attention and memory. *Development & Psychopathology*, *15*, 219–237.

Zimmermann, P., Maier, M. A., Winter, M., & Grossmann, K. E. (2001). Attachment and adolescents' emotion regulation during a joint problem-solving task with a friend. *International Journal of Behavioral Development*, *25*, 331–343.