Calm down
Till Pelle, Freja och Vidar.

Det absolut finaste jag har.
Calm down
Strategies for emotion regulation in clinical practice
Abstract


Problems with emotion regulation are common in people who seek help from health care professionals working with problems featuring psychological factors. Two such patient groups, chronic pain patients and patients with severe anxiety, are of interest in this dissertation. Effectively regulating and increasing functional emotion regulation in these patients is often challenging for clinicians, and effective strategies are needed. One treatment that greatly emphasizes the importance of functional emotion regulation is dialectical behavior therapy (DBT). DBT has a strong empirical basis in other patients with severe problems with emotion regulation, raising the question of whether the treatment and its more specific components (e.g., validation, which means communicating understanding and acceptance) could be effective in the groups of patients of interest here.

Accordingly, the overall aim of this dissertation was to expand our knowledge of how to use functional emotion-regulation strategies from DBT to regulate emotions in patients with chronic pain or treatment-resistant anxiety disorders. Study I examined whether brief training was enough to increase validation in partners of people with chronic pain, and whether this was associated with better-regulated emotion in the people with chronic pain. Study II explored patient perceptions of validation and invalidation by the physician in a clinical chronic pain context. Lastly, study III investigated whether a more extensive treatment intervention inspired by DBT was feasible and effective in patients suffering from treatment-resistant anxiety disorders.

The findings indicate that emotion-regulation strategies from DBT can be effective in regulating emotions in these patients. The dissertation also illustrates some of the difficulties in doing this, providing important information for future work, such as suggestions for modifications that might further increase positive outcomes.

Keywords: Emotion regulation; validation; invalidation; chronic pain; treatment-resistant anxiety disorders; dialectical behavior therapy, communication

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List of studies

This dissertation is based on the following studies, which hereafter will be referred to in the text by their Roman numerals.


Studies I and II were reprinted with kind permission from the Editor-in-Chief of Scandinavian Journal of Pain.
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<td>ASI</td>
<td>Anxiety sensitivity index</td>
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<tr>
<td>CBT</td>
<td>Cognitive and behavioral therapy</td>
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<tr>
<td>DBT</td>
<td>Dialectical behavior therapy</td>
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<tr>
<td>DERS</td>
<td>Difficulties in Emotion Regulation Scale</td>
</tr>
<tr>
<td>DSM-IV-I</td>
<td><em>Diagnostic and Statistical Manual of Mental Disorders</em>, 4th ed., <em>Axis I Disorders</em></td>
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<tr>
<td>EM</td>
<td>Expectation maximization</td>
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<tr>
<td>FFMQ</td>
<td>Five Facet Mindfulness Questionnaire</td>
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<tr>
<td>GAD</td>
<td>Generalized anxiety disorder</td>
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<td>HAD</td>
<td>Hospital Anxiety and Depression scale</td>
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<tr>
<td>IASP</td>
<td>International Association for the Study of Pain</td>
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<td>IBS</td>
<td>Irritable bowel syndrome</td>
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<td>MPI</td>
<td>Multidimensional Pain Inventory</td>
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<tr>
<td>NA</td>
<td>Negative affect</td>
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<tr>
<td>OASIS</td>
<td>Overall Anxiety Severity and Impairment Scale</td>
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<td>OCD</td>
<td>Obsessive compulsive disorder</td>
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<td>ODSIS</td>
<td>Overall Depression Severity and Impairment Scale</td>
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<td>PA</td>
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<td>PANAS</td>
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<td>PCS</td>
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<tr>
<td>PEM</td>
<td>Percentage of data points exceeding the median</td>
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<tr>
<td>PTSD</td>
<td>Posttraumatic stress disorder</td>
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<td>QDR36</td>
<td>Quality of Dyadic Relationship (36 items)</td>
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<td>SBU</td>
<td>Statens beredning för medicinsk och social utvärdering</td>
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<td>SCID-IV-I</td>
<td>Structured Clinical Interview for DSM-IV, <em>Axis I Disorders</em></td>
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Introduction

“I hate my emotions! They control me and my life, and I wish I didn’t have to feel them!”

~ Patient in psychiatric care, 2012

Influencing emotions is not easy. Many people would give their right arm if it meant deciding what to feel, how much to feel, and when to feel it. However, this is not part of being human. Instead, being human means feeling emotions, both positive and negative. Moreover, being human means not having one-hundred-percent control over what one is feeling. Some of us handle and regulate our emotions in effective ways, often with the result that our emotions (both positive and negative) are more helpful than problematic. However, for some people, a limited ability to influence emotions causes dysfunction and suffering.

This limited ability to regulate emotions is common in people who seek help from health care professionals working with problems in which psychological factors are important. Two of these patient groups, chronic pain patients and patients with severe anxiety, are of interest in this dissertation. Problems with emotion regulation have been emphasized as important in understanding both these conditions (Campbell-Sills & Barlow, 2007; Linton, 2013; Linton & Bergbom, 2011), but they are also highlighted as important in other problems commonly encountered in the health care setting (more specific examples will be described below). Because of this, it is unsurprising that interventions and treatments now available for these patients both explicitly and implicitly focus on functional emotion regulation (e.g. Barlow et al., 2011; Greenberg, 2015; Hayes & Strosahl, 2004; Linehan, 1993; Ljótsson et al., 2010; Welch, Osborne, & Pryzgoda, 2010; Wicksell, 2014).

One treatment that greatly stresses functional emotion regulation is dialectical behavior therapy (DBT; Linehan, 1993). DBT was originally developed through working with patients suffering from borderline personality disorder, patients known for intense emotions that spin out of control, repeated self-injury, and chronic suicidal tendencies (Lieb, Zanarini, Schmahl, Linehan, & Bohus, 2004). This group of patients was long considered extremely difficult to treat, but in the past twenty years progress has been made and DBT now has a strong empirical basis (e.g. Koerner & Dimeff, 2000; Lynch, Trost, Salsman, & Linehan, 2007; Neacsiu & Linehan, 2014). Three core strategies are generally emphasized
in DBT: dialectical, problem-solving, and validation strategies (Neacsiu & Linehan, 2014). Validation will be described in more detail below but, briefly stated, it refers to the communication of understanding and acceptance (Fruzzetti & Iverson, 2004). In the literature, validation is known for regulating emotions (Shenk & Fruzzetti, 2011), and it plays a central role in studies I and II in this dissertation. All core strategies are of importance in study III.

The effectiveness of DBT for borderline personality disorder has raised the question of whether the treatment and its more specific components could be helpful for other patients with emotion-regulation problems. Research into this question is generally sparse, however. Based on this, the overall aim of this dissertation was to expand our knowledge of how to use strategies for functional emotion regulation from DBT to regulate emotions in other patient groups. Specifically, this was investigated in chronic pain patients and patients with treatment-resistant anxiety disorders. Study I examined whether brief training was enough to increase validation in partners of people with chronic pain, and whether this was associated with regulated emotion in people with chronic pain. Study II explored patient perceptions of validation and invalidation from the physician in a clinical chronic pain context. Lastly, study III investigated whether a more extensive treatment intervention inspired by DBT was feasible and effective in patients suffering from severe anxiety, namely, patients with treatment-resistant anxiety disorders.

**Difficulties with emotion regulation in clinical populations**

The literature defines emotion regulation as the processes involved when individuals influence the emotions they experience, when they experience them, and how they experience and express them (Gross, Richards, & John, 2006). Unsurprisingly, many patients in psychiatric care, for example, patients with depression and anxiety, display problems with emotion regulation (Campbell-Sills, Ellard, & Barlow, 2014; Joormann & Siemer, 2014). Also, models of alcohol abuse (Sher & Grekin, 2007) and eating disorders (Polivy & Herman, 2002) suggest that individuals who lack functional skills in regulating emotions often turn to food or alcohol in an attempt to down-regulate negative emotions, which increases the risk of developing diagnosable problems related to alcohol or food. In addition, borderline personality disorder is now widely viewed as a disorder of the emotion-regulation system (Linehan, 1993). It has also been proposed that attempts to avoid inner experiences and emotions underlie many mental
disorders (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996), an assumption now empirically supported (Stewart, Zvolensky, & Eifert, 2002). Overall, these results indicate that difficulties with emotion regulation are common across many different psychopathologies.

Emotion-regulation problems are also present in patients suffering from somatic clinical problems. For example, it has been observed that people with irritable bowel syndrome (IBS) experience negative emotions and engage in problematic behaviors that serve to regulate those emotions (Ljótsson, 2011). Dysfunctional emotion regulation is also closely linked to poor sleep and insomnia (Gruber & Cassoff, 2014) and maintains problematic behaviors in chronic pain (Linton, 2010). Appropriate regulation of emotions has also been highlighted as important in stress (Sapolsky, 2007). Moreover, poor emotion regulation may increase the risk of cardiovascular ill-health, whereas effective emotion regulation may reduce risk and improve cardiovascular health (Appleton & Kubzansky, 2014). Overall, this supports the possibility that emotion-regulation difficulties are not only present in patients typically found in psychiatric care, but that other patients more often found in medical settings may also engage in dysfunctional emotion regulation.

This dissertation investigates functional strategies for emotion regulation in people with chronic pain and in people suffering from severe anxiety. We know that maladaptive emotion regulation is involved in the establishment and maintenance of these problems; unfortunately, it is not always directly targeted in treatment, and we need more knowledge of useful strategies.

**Chronic pain and difficulties with emotion regulation**

Pain is often defined as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage” (IASP, 1994). Pain can be both acute and chronic, which is usually determined by the temporal aspect. The pain patients examined in this dissertation suffer from chronic pain, which means that they have had pain for more than three months. Three months is considered an appropriate cut-off, because pain lasting beyond this point may signal a poorer prognosis in terms of recovery (Tunks, Crook, & Weir, 2008). In Western cultures today, chronic pain is considered a major health care problem that seriously affects quality of life at the individual level (Breivik, Collett, Ventafridda, Cohen, & Gallacher, 2006) and incurs large financial costs for society (SBU, 2006).
As the definition of pain states, pain and emotions are closely related. We respond to pain with emotions, and how we feel affects the pain we experience. Examples include the fear experienced when it feels as though something is breaking in one’s back when one is leaning down, and the headache that intensifies after an argument with one’s partner or disappears when one’s child falls and needs help and comfort. Although research has not yet been able to fully explain the relationship between pain and emotion, it is clear that the two are connected. For example, many studies have demonstrated that emotional distress is commonly observed in people with persistent pain (e.g. Dersh, Gatchel, Mayer, Polatin, & Temple, 2006; Fernandez & Turk, 1995; McWilliams, Cox, & Enns, 2003; Rode, Salkovskis, Dowd, & Hanna, 2006; Trost, Vangronsveld, Linton, Quartana, & Sullivan, 2012).

Because of this, it is unsurprising that emotion regulation has been highlighted as important in both the development and maintenance of chronic pain (Linton, 2013). Pain patients engage in various strategies that serve to down-regulate negative emotions, such as avoiding potentially painful movements due to fear of pain (Landström-Flink, Boersma, & Linton, 2013; Vlaeyen & Linton, 2000), taking prescription medicines (Breivik et al., 2006), and seeking distraction (Leventhal, 1992). This makes it important to develop and test the effectiveness of treatments and more specific interventions that aim to reduce dysfunctional emotion-regulation strategies and increase more functional ones.

**Anxiety and difficulties with emotion regulation**

Historically, anxiety has served (and still serves) a protective purpose for us as a species. The sometimes overwhelming emotion of anxiety and the associated behavioral responses represent the individual’s reaction to potentially life-threatening situations, a response that has been selectively favored from an evolutionary perspective (Barlow, 2002). Unfortunately, anxiety does not occur only in situations in which a threat is actually present, and sadly it not uncommonly generalizes to many different areas of a person’s life. In fact, anxiety is one of the most common mental disorders (Kessler et al., 2005), often starting in the early years and following a chronic path (Antony & Stein, 2009). Like pain, it is associated with functional impairment in the individual (McKnight, Monfort, Kashdan, Blalock, & Calton, 2016) and the costs to society are enormous (Greenberg et al., 1999). Here too, finding effective interventions is crucial.
Anxiety disorders have been conceptualized as dysfunctional emotion regulation (Kring & Bachorowski, 1999). It has also been suggested that many clinical features of anxiety disorders represent maladaptive attempts to regulate unwanted emotion (Campbell-Sills & Barlow, 2007), and that individual differences in the use of dysfunctional emotion-regulation strategies can be important for the occurrence and maintenance of anxiety disorders (Campbell-Sills et al., 2014). Specifically, patients with anxiety disorders use more dysfunctional emotion-regulation strategies, such as avoidance, rumination, and suppression, to influence their emotions and use fewer functional strategies, such as acceptance, reappraisal, and problem solving, than does the normative population (Aldao, Nolen-Hoeksema, & Schweizer, 2010). In addition, people with anxiety disorders have an impaired ability to understand their emotions, react more strongly to emotional stimuli, and have greater difficulty repairing negative emotions than do controls (Mennin, Heimberg, Turk, & Fresco, 2005; Turk, Heimberg, Luterek, Mennin, & Fresco, 2005). Emotion regulation is thus central to anxiety as well.

Treatment-resistant anxiety disorders
This dissertation focuses on a subgroup of anxiety patients, namely, patients who have received cognitive behavior therapy (CBT) without manifesting sustained improvements. CBT, with exposure as a main element, is considered an evidence-based treatment for anxiety disorders (Barlow, 2002; Butler, Chapman, Forman, & Beck, 2006; Olatunji, Cisler, & Deacon, 2010). However, not all patients benefit from it. It has been difficult to establish exactly how common it is to benefit or not benefit from CBT, because the outcome depends on the particular anxiety disorder involved and on how one defines effective and ineffective treatment outcomes. However, (Bystritsky, 2006) estimated that approximately 30% of anxiety patients recovered and an additional 30–40% improved with standard treatment. Still, about 30% of patients should be considered non-responders. As a clinician, it is indeed a challenge to know what treatment to offer these patients.

Why some anxiety patients do not respond to standard CBT is an understudied question. Research has attempted to identify predictors of non-response to CBT treatment. These predictors can be sub-divided into several categories: pathology related, environment related, patient related, and clinician related (Bystritsky, 2006). Pathology-related predictors include unknown biological factors, such as genetic or birth defects.
Environmental explanations include severe stressors, while patient-related predictors include severity of the anxiety disorder, cultural factors, and psychiatric comorbidity. Finally, treatment resistance might be affected by a lack of CBT training in clinicians or a lack of knowledge of anxiety disorders in general. In addition, two other possible explanations for non-response to treatment are the inability or reluctance of patients to engage or stay in treatment and the relapse of symptoms after effective treatment (Welch et al., 2010). Understanding non-response to treatment is complex and likely involves multiple factors.

Another possible explanation includes deficits in emotion-regulation skills in non-responding patients. Targeting emotion-regulation difficulties when treating specific anxiety disorders has been evaluated with promising results, for example, in posttraumatic stress disorder (Becker & Zayfert, 2001) and generalized anxiety disorder (Roemer & Orsillo, 2005). It has been suggested to be a potentially valuable approach for treatment-resistant anxiety disorders as well (Welch et al., 2010), but clinical studies are lacking.

**Learning theory and emotions**

Given that pain patients and anxiety patients have emotion-regulation difficulties that treatments should target, more information about how emotions are generated and regulated is needed. In general, emotion generation and regulation can be explained from a learning theory perspective. According to learning theory, human responses/behaviors are influenced by various forms of conditioning. In the current dissertation, a behavior or a response is anything that we do, think, or feel, meaning that learning theory can also be applied to emotions. Although some research indicates that factors related to our emotions are biologically determined and inherent (Banks, Eddy, Angstadt, Nathan, & Phan, 2007; Donegan et al., 2003; Lonsdorf et al., 2010), our emotional reactions and how we do or do not regulate them are also greatly affected by our experiences. The processes involved are described below.

**Classical conditioning**

Classical conditioning involves the learning of automatic/involuntary responses and focuses on antecedents, i.e., factors occurring before the response. Through classical conditioning, an individual learns a new association between two stimuli, specifically, between a neutral stimulus and one that already evokes a reflexive response.
Humans are born with a set of emotions that can be triggered automatically under certain circumstances (Ekman, 1992; Tomkins, 1982). This means that many emotional reactions exist because they are unconditioned responses triggered by unconditioned stimuli. For example, twisting one’s foot and feeling pain (unconditioned stimulus) likely elicits an automatic fear response (unconditioned response). Also, meeting a large truck that is rapidly moving towards one’s car on a narrow road (unconditioned stimulus) likely elicits a fear response (unconditioned response).

Through classical conditioning, a previously neutral stimulus can (if paired with an unconditioned stimulus) start to evoke a similar emotional response as the unconditioned stimulus, a phenomenon known as stimulus generalization (Dymond, Dunsmoor, Vervliet, Roche, & Hermans, 2015). In other words, stimulus generalization means that a previously neutral stimulus (e.g., a specific foot movement or aspect of one’s car or driving) can acquire functions similar to those of the original event or stimulus (Öhman & Mineka, 2001).

**Operant conditioning**

Operant conditioning involves voluntary responses and focuses on the role of reinforcing and punishing consequences following behavior. Positive reinforcement occurs when a stimulus presented after a response (e.g., increased feelings of happiness or positive feedback from a co-worker) increases the likelihood of that response occurring again in a similar situation. Negative reinforcement generally refers to the removal of an aversive stimulus (e.g., reduced anxiety or one’s boss no longer being angry) that increases the likelihood of the response occurring again in a similar situation. In contrast, punishing consequences tend to decrease the likelihood that the response will be repeated in similar situations in the future.

Operant conditioning also affects our emotional reactions. One example is the role of negative reinforcement in learning to avoid distressing or painful situations or emotional responses, for example, avoiding certain movements because of fear that they will be painful. Classical conditioning is often involved when a fear response is first conditioned, but operant conditioning due to avoidance behaviors is more than often part of maintaining and worsening the problem, in what is called two-factor learning (Mowrer, 1951).
Learning theory and emotion regulation

Learning shapes a person’s repertoire of both adaptive and maladaptive emotion-regulation strategies. Learning is a dynamic process, which means that reactions that have been conditioned can also be weakened or replaced by new relationships. Because of this, many psychological treatments, including DBT, use principles based on learning theory to directly or indirectly target emotion regulation in treatment. For example, many strategies are used in order to increase the likelihood that patients will come into contact with positive consequences that will reinforce positive emotions and functioning.

Many emotion-regulation strategies can be understood from a learning-theory perspective. Due to space limitations, it is impossible to describe them all here, but since validation is central to this dissertation it needs to be discussed in more detail. Some of the effects of validation can be understood from an operant perspective. From this standpoint, validation is a form of social reinforcement likely to increase the response it follows, for example, the response to disclose inner experiences or display pain behaviors (Edmond & Keefe, 2015). Based on this operant view, a legitimate worry is that providing validation may increase pain behaviors. This issue has been addressed by Linton (2015), who says that this fear may be based on a naïve view of validation. Instead, it has been suggested by Fruzzetti (2006) that validation reinforces disclosure of inner experiences in what is known as trust building. Linton (2015) also describes how validation can address emotional distress without reinforcing dysfunction, mainly because validation fosters listening, encourages the description of inner feelings and experiences, and is not simply a matter of agreeing with the other person. Instead, invalidation may increase pain behaviors because it reinforces further attempts to convince the other person that the pain and suffering are actually real. Unfortunately, studies investigating exactly what it is that is being reinforced by validation are lacking.

Exposure is perhaps the easiest emotion-regulation strategy to describe from a learning perspective. It is used to modify behaviors related to anxiety by stopping avoidance and allowing the relationship between the conditioned stimulus and the conditioned response to be broken. Specifically, this happens if the conditioned stimulus (e.g., the specific foot movement or driving one’s car) is repeatedly presented without the unconditioned stimulus (e.g., pain or big trucks on a narrow road) until it does not elicit the conditioned response (Sundel & Sundel, 2005). Exposure is of specific importance in the third study in this dissertation.
Then, there are strategies known to regulate emotions for which the change mechanisms are unclear. For example, exactly why validation regulates emotions is unclear, but one possible explanation is that it communicates safety (Fruzzetti, 2006). Another example is mindfulness, which has been defined as “paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally” (Kabat-Zinn, 1994). The positive impact of mindfulness on emotion regulation is known (Arch & Craske, 2006; Chiesa & Serretti, 2009; Keng, Smoski, & Robins, 2011), but the exact mechanisms underlying it have not been established empirically. However, it has been suggested that mindfulness enhances emotion regulation because it limits reactivity (Linehan, Bohus, & Lynch, 2007). It has also been considered helpful because it increases awareness (Erisman & Roemer, 2010), which is known to be important in functional emotion regulation (Gratz & Roemer, 2004). Flexible self-regulation, value clarification, and exposure may also be involved (Nykliček, 2011).

**Emotion**

To understand the concept of emotion regulation, what emotions are and how they are generated need to be discussed. Defining what an emotion is has been extremely challenging. Throughout history, definitions have emphasized different aspects of the concept, for example, emotions as feelings of arousal (James, 1884), emotions as internal physical mechanisms (Watson, 1924), and emotions as expressive behavior (Darwin, 1965), while other definitions have emphasized the relationship between emotions and evaluation/appraisal (Arnold, 1960). Overall, philosophers, psychologists, researchers, and other knowledgeable people have worked on their own descriptions, resulting in a large number of definitions in the literature. For example, in 1981 researchers compiled a list of these descriptions and found no fewer than 92 of them (Kleinginna & Kleinginna, 1981). This illustrates that trying to define emotion has been a struggle marked by great disagreement.

The good news is that there is now much greater agreement, although concerning only the more general features of emotion (Izard, 2010). The definitions available today treat emotions as consisting of multiple components (which was not the case when Kleinginna & Kleinginna conducted their study in 1981). This can be seen as a sign that our understanding of the concept is now broader (Izard, 2010). One commonly used definition is that an emotion consists of a number of psychological states, including subjective experience, physiological responses, and...
expressive behavior (Gross & Feldman-Barrett, 2011). For example, the experience of anger can be seen as combining negative thoughts about the source of the anger, feelings of distress, elevated heart rate and shaking, and an attack on the object connected to the anger. Another example is happiness, which consists of a combination of positive thoughts connected to the source, feelings of pleasure, a calm, relaxed bodily state, and approaching the object connected to the happiness.

**The modal model of emotion**

Overall, this view of an emotion as consisting of multiple components illustrates that an emotion is best viewed as more than just a fixed state at a particular time. Consequently, it is helpful to look at emotion as a process with several core features. One attempt to summarize the core features of emotion, and thus the process of emotion generation, is the modal model of emotion (Gross, 1998b). This model (see Figure 1) suggests that the emotion-generation process occurs in a specific sequence over time, summarized as follows:

1) **Situation** - considered emotionally relevant to the individual, often with a particular goal in mind (can be both external and internal);
2) **Attention** - the situation is attended to by the individual;
3) **Appraisal** - the situation is evaluated and interpreted, both consciously and unconsciously; and
4) **Response** - as a result of appraisal, changes in experiential, behavioral, and neurobiological response systems occur.

It is important to note that the responses included in the fourth step of this process often directly influence and sometimes change the first step (i.e., the situation that started the process in the first place), making this an ongoing and dynamic process.
To further describe this model, the following example may be helpful. Lisa is at home alone one night, and it is getting dark outside. She is preparing dinner for herself when she hears a loud banging sound (i.e., situation) and her attention is of course drawn to it. The sound seems to be coming from the basement, and several thoughts start passing through Lisa’s mind: “Someone must be down there!” and “What if that person wants to hurt me?” After these appraisals, the response occurs, including physiological changes, the experience of an emotion, and the behaviors associated with the emotion. Lisa’s hands get sweaty and her heart starts beating faster. She experiences intense fear and runs out of the house. She runs across the street to her neighbor, who lets her in. Due to the response that this process created, Lisa now finds herself in a new situation in which a new sequence can start.

**Emotion regulation**

For Lisa, the emotion of fear experienced in this situation can be seen as very helpful if it turned out that someone who wanted to hurt her was actually hiding in the basement. However, what if she often interpreted sounds in her house as threats even though they were not? What if she often felt insecure and afraid in her own home? And what if these feelings escalated, making it impossible for Lisa to be at home alone due to fear? Then, instead of helping her, the emotions would have started to be problematic, seriously affecting her quality of life. For this not to happen, Lisa would need to engage in various types of emotion-regulation strategies.

In short, emotion regulation has been defined as the processes by which people change their emotions in both automatic and controlled ways in order to respond to the environment appropriately (Bargh & Williams, 2007; Eisenberg, Fabes, Guthrie, & Reiser, 2000). Another well-used definition is that emotion regulation refers to what individuals do to
influence the emotions they experience, when they experience them, and how they experience and express them (Gross et al., 2006). However, although a clear and well-defined description of emotion regulation might be important, it is difficult to capture the complexity of the concept in just one sentence. After all, many things can be considered emotion regulation. Like emotion, emotion regulation is therefore best described using a model.

**The process model of emotion regulation**

Several available frameworks conceptualize emotion regulation (e.g. Koole, 2009; Larsen, 2000; Parkinson & Totterdell, 1999). However, the one that has been most influential over the past decade is the process model of emotion regulation (Gross, 1998a, 1998b). This model captures the complexity of emotion regulation and highlights that an individual has several options when regulating emotions. A central assumption is that people have a repertoire of emotion-regulation strategies that they can use to modify or alter their emotions, and this assumption is also supported in the literature (Aldao & Nolen-Hoeksema, 2012). While the modal model of emotion illustrates emotion generation, the process model of emotion regulation (see Figure 2) illustrates when and how emotions can be regulated. To make this clear, the model is organized in a sequential manner, illustrating when in the emotion-generation process different types of emotion regulation might occur (Gross, 2014).

![Figure 2. The process model of emotion regulation (Gross, 1998b). The model builds on the modal model of emotion and identifies each point in time when emotions can be altered.](image-url)
The model presents five groups of emotion-regulation processes: situation selection, situation modification, attentional deployment, cognitive change, and response modulation (Gross, 2014). *Situation selection* refers to approaching or avoiding certain people, places, or stimuli in order to regulate emotions. In Lisa’s case, an emotion-regulation strategy at this stage of the process might be to plan other activities away from home when her family is away at night. *Situation modification* refers to changing the situation so that its emotional impact will be different. For Lisa, an example would be inviting a friend to spend the evening with her so that she will not be alone in the house at night. Because changing a situation sometimes creates a new situation, it is sometimes difficult to differentiate between situation selection and situation modification (Gross, 2014). *Attentional deployment* refers to directing attention towards different aspects of a situation in order to alter the emotion. For Lisa, examples of this would be distracting herself in various ways, perhaps by watching a movie, engaging in a cognitively challenging task, or putting on music on which she can focus her attention. *Cognitive change* refers to changing one’s thoughts and interpretations about the situation in order to alter its impact on one’s emotions. In Lisa’s case, an example of this would be thinking differently about the source of the sounds if she hears any, for example: “it was the wind making the sounds” or “it was just my neighbor slamming her front door—nothing to worry about.” *Response modulation* refers to trying to directly influence the experiential, behavioral, or physiological components of the emotion. These are actions that occur after the emotional response has already started. For Lisa, an example would be drinking a glass of wine to calm herself if she becomes afraid, or calming herself by breathing slowly. Note that what she did in the original example, i.e., running out of the house across the street to the neighbor’s house, was a response-modulation strategy.

The model also distinguishes between antecedent-focused and response-focused emotion-regulation strategies (Gross, 1998a; Gross et al., 2006). Antecedent-focused strategies are things that the individual does before the emotional response has been fully activated, and their purpose is to modify future emotional responses (Gross, 1998a). Strategies that fall within this category are situation selection, situation modification, attentional deployment, and cognitive change. In contrast, response-focused strategies occur when the individual has already started to experience the emotion (Gross, 2014). Strategies that fall within the response-modulation category
are found here. With these strategies, the main goal is to manage existing emotions (Gross, 1998a).

Though established and well known, the process model of emotion regulation has been criticized. One criticism is related to the empirical evidence for the model. For example, although some studies demonstrate that people use situation-selection and situation-modification strategies to regulate their emotions (Belzer, D’Zurilla, & Maydeu-Olivares, 2002; D’zurilla, Chang, & Sanna, 2003; Jaffee & D’Zurilla, 2003), experimental studies demonstrating exactly how people use these two groups of emotion-regulation strategies are lacking. On the other hand, an extensive literature demonstrates that people use attentional deployment and cognitive change as means to alter the emotions they are experiencing (Gross, 1998a; Kalisch, Wiech, Herrmann, & Dolan, 2006). Another criticism concerns the organization of emotion-regulation strategies along a timeline, which indicates that responses occur in a fixed cycle (Koole, 2009). Koole points out that the order in which emotional responses occur is variable, and it is problematic to assume that, for example, attention always precedes cognitive appraisal, which in turn always precedes behavior. Supporting this are studies indicating that emotional responses sometimes do not occur in the fixed order stated in the modal and process models (Niedenthal, Barsalou, Winkielman, Krauth-Gruber, & Ric, 2005; Strack, Martin, & Stepper, 1988).

**Emotion regulation versus emotional control**

Some conceptualizations of emotion regulation stress the importance of controlling emotions and their expression (Garner & Spears, 2000). Clearly, strategies with this primary aim are an important part of emotion regulation, but emotion regulation should not be seen as the same thing as emotional control and does not necessarily entail immediately eliminating negative affect.

Instead, the functionality of the whole range of emotions should be highlighted (Thompson, 1994). This view stresses that accepting and experiencing emotions without trying to change them is also an important part of emotion regulation. Acceptance has been defined as “the active nonjudgmental embracing of the experience in the here and now” (Hayes, 2004), an approach that encourages individuals to experience their emotions, thoughts, and bodily sensations without trying to change, avoid, or control them. Acceptance can be seen as the opposite of emotional control, because it involves welcoming and experiencing all types of internal
sensations instead of pushing them away. The positive effect of emotional acceptance versus control on emotion regulation is known (Campbell-Sills, Barlow, Brown, & Hofmann, 2006; Eifert & Heffner, 2003).

**Emotion regulation of positive emotions**

Although most attention in the literature has been directed toward the down-regulation of negative emotions, the up-regulation of positive emotions has also been examined (Parrott, 1993). For example, such up-regulation has been investigated when studying emotion regulation in the everyday life of young adults (Gross et al., 2006). Although it is not used as frequently as the down-regulation of negative emotions, results indicate that people also engage in positive emotion regulation. Up-regulating positive emotions can reduce the negative impact of negative emotions, at least in the short term (Tugade & Fredrickson, 2004).

Although the main focus in this dissertation is on the regulation of negative emotions, it is important to note that positive emotions are also targets of emotion regulation. It is also important to note that the line between the two is not always clear. For example, do I go to the gym to feel good about myself or to eliminate guilty feelings about not exercising enough? To determine, one must look separately at each situation.

**Interpersonal emotion regulation**

Considering the content of this dissertation, it is also important to clarify that emotion regulation can be both intrapersonal and interpersonal (Campos, Walle, Dahl, & Main, 2011; Zaki & Williams, 2013). This means that emotion regulation not only takes place within the individual, but also in social contexts (Marroquín, 2011; Morris, Silk, Steinberg, Myers, & Robinson, 2007; Rimé, 2007). It has even been observed that up to 98% of all emotion-regulation episodes may take place in the presence of other people (Gross et al., 2006). This has been taken into account in this dissertation, most prominently in studies I and II, which investigate validation in a chronic pain context. As has already been mentioned and will be described in more detail below, validating communication is known for its regulating effect on emotions. In the area of chronic pain, little is known about whether and how other people can be used to aid functional emotion regulation in patients.

Being in a couple when emotions need to be regulated can definitely make things easier (Coan, Schaefer, & Davidson, 2006; Mikulincer, Shaver, & Pereg, 2003). However, managing emotions with more than one person
involved can also make things more complicated (Campos et al., 2011). For example, when two people are present, both individuals need to attend to their own emotional states and attempt to regulate their as well as the other person’s emotions. Moreover, not all attempts to regulate emotions are logical, well thought through, and functional, with much depending on the individual’s learning history. Also, all individuals have their own emotional motivations, goals, strengths, vulnerabilities, and “buttons” to be pushed. Overall, this can easily create a complicated situation with emotions changing continuously as the two people express and regulate their own emotions, respond to each other’s emotions, and attempt to regulate their own and the other person’s emotions (Levenson, Haase, Bloch, Holley, & Seider, 2014).

It is safe to say that emotion regulation in the presence of other people puts high demands on the people involved. Just as a social context can be helpful in emotion regulation (e.g., by providing supportive and allowing certain emotions), it can also contribute to emotions intensifying and escalating out of control.

Maladaptive and adaptive emotion regulation

Engaging in emotion regulation is not necessarily positive, and knowing whether a strategy is adaptive or maladaptive is not always easy. It has been stated that emotion regulation is dysfunctional when it does not change the emotion in the desired way or when its long-term consequences are more negative than the short-term benefits (Werner & Gross, 2010). It has also been suggested that difficulties experiencing and differentiating between the full range of emotions might be just as maladaptive as having difficulties reducing and controlling strong negative emotions (Cole, Michel, & Teti, 1994). This could be because a lack of awareness of emotions prevents the individual from engaging in emotion regulation early on, before intense emotional responses occur.

In addition, flexibility in the use of emotion-regulation strategies has also been stressed (Cole et al., 1994), and it has been suggested that adaptive emotion regulation involves changing the intensity or duration of a specific emotion instead of eliminating that emotion completely (Thompson, 1994). This is thought to be important because reducing the intensity or duration of an emotion makes it more likely that the individual will be able to control impulses associated with the emotion. That acceptance is an adaptive emotion-regulation strategy has already been mentioned, and many stress
the importance of evaluating and accepting emotional experiences for adaptive emotion regulation (Cole et al., 1994; Linehan, 1993).

Determining what strategies are considered purely functional/adaptive or purely dysfunctional/maladaptive is not as straightforward as one might think. Instead, the literature indicates that many known adaptive strategies can also be maladaptive, and vice versa (Aldao et al., 2010). For example, using situation-selection and situation-modification strategies can definitely help reduce negative affect; however, when used too often and inflexibly, they become problematic (Barlow, 2000; Campbell-Sills & Barlow, 2007). The same is true for attentional-deployment strategies, such as rumination (Vassilopoulos, 2008), worry (Borkovec, 1994), and distraction (Campbell-Sills & Barlow, 2007). Reappraisal, which falls into the cognitive change category, appears to be both adaptive (Gross & John, 2003) and maladaptive (Aldao et al., 2010). Finally, suppression, an emotion-regulation strategy, included in the response-modulation category, refers to efforts to inhibit the behavior/impulses associated with the emotion (Gross, 1998b). In the literature, suppression has been described as both adaptive (Gross, 2002) and maladaptive (Amstadter, 2008; Gross & John, 2003). All these findings indicate that it is the context that determines whether a strategy is a good or bad choice.

Based on this conceptual and empirical work, adaptive emotion regulation can be seen as involving the following processes: a) awareness and understanding of emotions, b) acceptance of emotions, c) the ability to control behavior and behave in line with personal goals even when experiencing negative emotions, and d) the ability to use emotion-regulation strategies appropriate in a given situation to modify emotional responses in order to achieve goals and meet situational demands (Gratz & Roemer, 2004). Difficulties in any, more than one, or perhaps even all of these processes indicate maladaptive emotion regulation.

**Emotion dysregulation**

Early definitions of emotion dysregulation tended to be rather one-dimensional and unspecific: for example, emotion dysregulation was defined as failure to meet the demands of emotional development (Garber & Dodge, 1991) or as poor control over emotional experience and expression (Izard, 1977). Today, the view is more multifaceted and nuanced, and one definition originating in clinical work is that emotion dysregulation occurs when the individual cannot change emotional cues, experiences, actions, and verbal and nonverbal responses in a desired way,
even when the individual makes a concerted effort (Neacsiu, Bohus, & Linehan, 2014). In other words, emotion dysregulation occurs when attempts to down-regulate emotions fail, causing the emotion to spin out of control and making it impossible to control the impulses associated with it.

Emotionally dysregulated individuals also experience other consequences of high negative arousal, such as problems turning attention away from stimuli, cognitive distortions, and difficulties with correct information processing (Fruzzetti, Crook, Erikson, Lee, & Worrall, 2009). In addition, they have difficulties controlling their behaviors and impulses (Linehan et al., 2007), and their main goal becomes to reduce the painful emotional arousal.

It should also be noted that being dysregulated is not the same as being upset (Cole et al., 1994; Fruzzetti et al., 2009), and emotion dysregulation should not be equated with emotional intensity (Gratz & Roemer, 2004). It is possible to be upset or experience intense negative emotion and still be aware of and act in accordance with one’s personal goals. Emotion dysregulation should also not be equated with maladaptive emotion regulation, although emotion dysregulation can of course be a consequence of maladaptive attempts to regulate emotion. Emotion dysregulation can also present itself as suppression and over-control of emotions (Linehan, 2015). In this case, an overregulated expression of emotion hides high levels of internal distress (Cole et al., 1994).

Dialectical behavior therapy

One treatment approach specifically designed to target emotion regulation is dialectical behavior therapy (DBT), a cognitive behavioral treatment originally developed through working with chronically suicidal and emotionally dysregulated patients (for a complete treatment manual, see Linehan (2015). Although there are many components to the treatment, its application of behavioral science/learning theory and eastern mindfulness in combination with a dialectical worldview are its defining features (Dimeff & Linehan, 2001; Linehan & Schmidt, 1995). The dialectics in DBT emphasize that opposites can be equally true at the same time, and one goal of treatment is to replace rigid, fixed thoughts with more flexible thinking (Dimeff & Koerner, 2007). The most fundamental dialectic in DBT is the one between acceptance and change (Dimeff & Linehan, 2001), and the treatment focuses on replacing maladaptive behaviors with more skillful behaviors that aim to help patients regulate their emotions in more effective ways (Linehan, 2015; Neacsiu, Rizvi, & Linehan, 2010).
The pronounced focus on increasing functional emotion regulation in combination with a strong empirical basis for treating borderline personality disorder raises the question of whether DBT and its more specific components might also be helpful for other patients in whom emotion regulation is a problem. As already pointed out, emotion-regulation difficulties are present in both chronic pain patients and patients suffering from anxiety disorders. Validation has been proposed as a way to enhance emotion regulation in chronic pain patients (Cano & Williams, 2010), and DBT as a whole treatment package has been suggested as a potentially valuable treatment for these treatment-resistant patients (Welch et al., 2010). At this point, however, more empirical study of the matter is needed.

**DBT and emotions**

In DBT, emotions are considered “complex, brief, involuntary, patterned, full-system responses to both internal and external stimuli” (Linehan et al., 2007). Like other therapeutic approaches (Tooby & Cosmides, 1990), DBT also emphasizes the adaptive value of emotions and views them as systemic (Linehan, 2015). DBT views emotions as consisting of the following interactive subsystems: 1) emotional vulnerability to cues, 2) internal and/or external events that, when attention is paid to them, serve as emotional cues, 3) appraisal and interpretation of cues, 4) response tendencies, including physiological responses and action urges, 5) expressive responses and actions (both verbal and non-verbal), and 6) after effects of the initial emotion. In DBT, the behaviors associated with an emotion should be seen as part of the emotion, not just as consequences of it (Linehan, 2015).

Clearly, the DBT way of looking at emotions is similar to the modal model of emotion (Gross, 1998b) previously presented. Both the modal and DBT models consider the importance of attention and appraisal in the emotion-generation process. Both models also highlight how the emotions generated can directly affect the situation that gave rise to the emotion, which in turn can affect future emotions. Moreover, both models say that to influence emotions, any part of the process can be targeted. Despite their similarities, there are differences between the models mainly attributable to their different origins (i.e., clinical vs. basic science). For example, DBT includes more distal factors that can influence the emotion-generation process, such as emotional vulnerability, which refers to the effects that factors not directly part of the situation can have on the emotion-generation process (Neacsiu et al., 2014). Examples of emotional vulnerability factors
are PTSD (Harned, Rizvi, & Linehan, 2010) and poor sleep (Gujar, Yoo, Hu, & Walker, 2011). Another difference is that the DBT model focuses more on difficulties of emotion regulation that occur after the emotional response has already started (Neacsiu et al., 2014). Research has demonstrated that processes occurring late in the emotion-generation process are important for psychopathology (Aldao et al., 2010), which supports this focus when working with clinical populations.

DBT also distinguishes between primary and secondary emotions (Linehan, 1993), a distinction presented many years ago (Greenberg & Safran, 1989) and not unique to DBT. In short, primary emotions are universal and healthy emotional responses to situations and stimuli, and secondary emotions are learned emotional responses (Linehan, 1993). Sometimes secondary emotions are the result of learned responses to the primary emotion itself and sometimes they are the result of judgments (Gratz, 2007). Although secondary emotions can be adaptive, the general rule is that they block the experience and expression of primary emotions (Greenberg & Safran, 1989). In DBT, clients are encouraged to listen to the information provided by their primary emotions and to act in adaptive ways based on this information (Gratz, 2007). It has been suggested that experiencing negative emotions in response to primary emotional reactions is maladaptive and associated with greater difficulties in emotion regulation (Greenberg & Paivio, 1998).

**DBT and emotion regulation**

Emotion regulation from a DBT perspective is described in the DBT extended model of emotion regulation (Neacsiu et al., 2014; see Figure 3). At first, it is no different from the process model presented above. Emotion starts in a situation in which a stimulus is attended to by the individual. The stimulus is judged/appraised by the individual, triggering the emotional response. Here the first difference between the models appears. In the DBT model, the emotional response is divided into two parts: experiential/biological and expression/action. As mentioned, research has demonstrated that processes occurring after the emotion onset are important for psychopathology (Aldao et al., 2010), which supports highlighting later rather than earlier processes when working with a clinical population. This is why DBT particularly emphasizes emotion regulation after rather than before the emotional response.
Figure 3. The DBT extended model of emotion regulation (Neacsiu et al., 2014). Grey boxes represent different families of emotion-regulation strategies possible at different points in the emotion-generation process.

Unlike Gross’s model, the DBT model then includes vulnerability factors that affect all components of the model (Neacsiu et al., 2014). Finally, the emotional response is followed by the after effects of the emotion, such as secondary emotions. Although the DBT and modal models of emotion have different origins, they have many similarities. For example, they both emphasize the adaptive and evolutionary value of emotions (Gross & Thompson, 2007; Neacsiu et al., 2014). Also, they both highlight the importance of attention and appraisal in the process of emotion generation as well as how the effects of the emotion can feed back and in turn affect the context in which the emotion arose in the first place.

**Emotion-regulation strategies in DBT**

In addition to the five sets of emotion-regulation processes specified in the process model of emotion regulation, the DBT model targets five additional processes: managing emotional vulnerability, biological change, expression, action change, and emotion processing targeting the after effects of the initial emotion (Neacsiu et al., 2014). In DBT, skills are available for each of these emotion-regulation processes, although these skills can often be applied to more than one process. The rationale for practicing emotion-regulation skills in DBT is that mastery of skills will improve functional
emotion regulation, leading to decreased problems with emotion regulation and dysregulation (Linehan, 1993). This rationale is supported by research into treating borderline personality disorder (Neacsiu et al., 2010; Stepp, Epler, Jahng, & Trull, 2008), but research into, for example, chronic pain and severe anxiety is lacking.

**DBT and chain analysis**

Analyzing responses in the context in which they occur is considered an important strategy in DBT, and this is done through behavioral chain analysis. The purpose of chain analysis is to identify the problem, its cause, the function of the response, what is interfering with the resolution of the problem, and the help available to resolve the problem (Linehan, 1993). To do this, chain analysis puts the response in the context of a series of components (see Figure 4) linked together because they follow one another. When any links of the chain can be broken, the problematic response can be stopped (Linehan, 2015).

When conducting a chain analysis, a meticulous, step-by-step description of the events that led up to and followed the response is compiled. To do this, the therapist and patient seek answers to the following questions: 1) What exactly was the problem behavior? 2) What event in the environment (i.e., the prompting event) started the chain of events? 3) What were the specific vulnerability factors on that day? 4) What was the chain of events (one link at a time) that led from the prompting event to the problem behavior? 5) What were the consequences of the behavior? After the different links are identified, the work of trying to find alternative behaviors and skills at different time points in the chain begins.

![Figure 4. Schematic of a chain analysis.](image-url)
**DBT and validation**

Validation is considered one of three fundamental acceptance-based strategies in DBT and, together with dialectical strategies and problem-solving strategies, it forms the core of the treatment (Linehan, 1997). In short, validation entails communicating understanding and acceptance (Fruzzetti & Iverson, 2004). When one validates another person, one does not primarily try to change the other person’s experiences; instead, the focus is on highlighting them so that the person will come to accept them and experience them fully (Shenk & Fruzzetti, 2011). In other words, one communicates how, for example, the other person’s emotions, thoughts, or actions are completely understandable because they are relevant, meaningful, justifiable, correct, or effective. Sometimes this means just listening attentively and showing that one is paying attention, for example, maintaining eye contact and saying “ah, I see” or nodding and saying “uh-huh” at appropriate times. However, sometimes more complex responses are needed, such as: “I can see this is very upsetting for you”; “You are sad, it makes sense—anyone would feel the same way in this situation”; or “I would feel the same way.” At other times, a behavioral response is needed (Fruzzetti, 2006; Linehan, 1997), such as getting a blanket if the other person is cold.

There are many ways in which one can validate another person, and these different validation responses are summarized and organized in six levels, as shown in Table 1. Each level is more complex that the one preceding it, and each level depends on one or more of the preceding ones. The general rule is to validate at as high a level as possible (Koerner & Linehan, 2003). These levels were included in the partner training that were part of study I in this dissertation.

**Validation versus empathy**

Validation has been described as empathy plus communicating that the person’s perspective is valid in some way (Koerner, 2012; Koerner & Linehan, 2003). This highlights the difference between validation and empathy. Yes, they are similar, and empathy is required in order to validate another person, but it is not sufficient in itself (Koerner & Linehan, 2003; Linehan, 1997). In order to validate, one also needs to communicate what one sees.
Validation versus reinforcement
Validation is not the same thing as reinforcement, although it very often has a reinforcing effect (Koerner & Linehan, 2003; Linehan, 1993). In other words, validation often serves as a reinforcer, and it is important to keep in mind that what we validate we will often see more of. However, it is important to remember that it is the context that determines whether or not something constitutes reinforcement (Sundel & Sundel, 2005), which is also true when it comes to validation (Koerner & Linehan, 2003).
<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
<th>Example</th>
<th>Intended outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Listening and observing (active listening); ask questions.</td>
<td>Listen and observe in a non-judgmental way; actively try to make sense of what the other person is communicating and experiencing.</td>
<td>Show an interest in the other person and what he/she is saying: “What happened then?” “Tell me more.”</td>
</tr>
<tr>
<td>2.</td>
<td>Accurate reflection.</td>
<td>Communicate understanding by repeating or rephrasing what the other person is saying without added interpretation.</td>
<td>“I can see this is very hard for you, the whole situation must make you very frustrated.”</td>
</tr>
<tr>
<td>3.</td>
<td>Articulate the unverbalized (emotions, thoughts, or behavior patterns).</td>
<td>Communicate what has not been explicitly said, indicating a deep understanding of the other person.</td>
<td>“I wonder if this is similar to what happened last week?” “Maybe you’re also feeling sad about this?”</td>
</tr>
<tr>
<td>4.</td>
<td>Describe how the other person’s experiences make sense in terms of past learning history or biology.</td>
<td>Identify possible factors that influence the other person’s behavior or experiences, and communicate them to the other person.</td>
<td>“When one’s been through what you’ve been through, it’s understandable that this is tough.”</td>
</tr>
<tr>
<td>5.</td>
<td>Describe how the other person’s experiences make sense in light of current circumstances.</td>
<td>Find a way in which something is currently valid, and is, for example, a normal response.</td>
<td>“Most people would feel the same way.”</td>
</tr>
<tr>
<td>6.</td>
<td>Be radically genuine: validate the person as such.</td>
<td>Act in a manner that communicates respect and equality to the other person. Here the individual, rather than any particular response or behavior, is validated.</td>
<td>“You’ve really worked hard and I understand that you’re tired, but I know you can do it. I believe in you.”</td>
</tr>
</tbody>
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Invalidation

Invalidation is when one communicates that what the other person is feeling, thinking, wanting, or doing is wrong or illegitimate, or is not worthy of one’s attention or respect (Fruzzetti, 2006; Fruzzetti & Iverson, 2006). In other words, when one invalidates another person, one communicates that one has failed to understand and accept the other person’s experiences (Fruzzetti & Worrall, 2010). Just as with validation, this can be done in many ways, for example, by simply not paying attention, by minimizing the other person’s experiences, or by telling the other person how or what he or she “should” feel or want. This can also be done by criticizing the other person judgmentally.

The tricky thing about invalidation is that it is unintentionally easy to invalidate people one cares about. Perhaps the most common trap is when we want to remove all their pain and make them feel better as quickly as possible and therefore minimize their experiences. Another trap that is easy to get into is problem solving, when the appropriate response would instead be simply to listen and provide support. In DBT, it is stated that these tendencies should be resisted because they can be invalidating (Linehan, 1993). Also, our own negative emotions and judgments increase the risk of invalidating the person one is talking to (Fruzzetti, 2006). This demonstrates that when one wants to validate another person, good intentions are not always enough.

Validation of the valid and invalidation of the invalid

It also constitutes invalidation to validate the invalid, which is when one responds to dysfunctional behaviors in supporting and accepting ways (Fruzzetti & Shenk, 2008). From a therapeutic perspective, this means that one should not validate dysfunctional behaviors or behaviors that are incompatible with the client’s long-term goals (Koerner & Linehan, 2003). This is important due to the reinforcing effects that validation can have on the thing being validated. This is also important because it makes it is possible to “tell it like it is,” and not have to “walk on eggshells” around the other person (Koerner, 2012). If invalidations of the invalid are balanced with a lot of validations of valid things, being honest even about the toughest things will often not be a problem (Koerner & Linehan, 2003).

In DBT it is assumed that there is some validity in every response (Linehan, 1993), though it is not always easy to determine exactly what is valid and what is invalid. An aspect of another person can simultaneously be valid from the perspective of one set of circumstances, but not from
another (Linehan, 1997). Things can also be valid for different reasons (Fruzzetti & Iverson, 2004; Fruzzetti, Shenk, & Hoffman, 2005), for example, because they are relevant, normative, meaningful, justifiable, correct, or simply just exist. Sometimes validity can be found in the current context (e.g., the stimulus that triggered a response), antecedents (e.g., prior events), consequences (e.g., it is effective), or past learning history (Koerner & Linehan, 2003). To determine when to validate another person, one must consider the particular validation target and identify what makes that particular feeling, thought, or behavior valid at a given moment (Koerner & Linehan, 2003).

Things can also be valid and invalid at the same time (Koerner, 2012; Koerner & Linehan, 2003). Returning to the example of Lisa, when she heard a sound from the basement that she could not identify, interpreting it as dangerous made fear a valid feeling. It makes sense for anyone at risk of being attacked to experience fear. At the same time, Lisa’s cognitive interpretation of the situation was incorrect (i.e., no one was hiding in the basement, and assuming the opposite was untrue), making her thoughts in this situation invalid. An appropriate response to Lisa in this case would be something like, “I know it must have been scary, and I would have felt the same if I thought someone was hiding in the basement [validation of the valid]. However, there’s no one there, so next time go down and look [invalidation of the invalid], otherwise you’ll be afraid in your own house, and that will not work in the long run.”

This makes validation very suitable to use when interacting with and/or treating chronic pain patients. Although many aspects of these patients’ experiences and behaviors are valid and should be validated, there are also invalid aspects that one wants to avoid validating. In this way, validation can be helpful in providing support without reinforcing dysfunction. As mentioned, the possible benefits of validation in this context have been highlighted, but applicable research is sparse.

**Effects of validation and invalidation**

From a developmental perspective, biosocial theory in DBT describes the role of the early invalidation of experiences and emotions in the development of later psychological problems (Linehan, 1993). Biosocial theory suggests that growing up in invalidating families can prevent the child from learning how to recognize, label, trust, and regulate emotions, and many studies now indicate that childhood invalidation is associated
with later emotion-regulation difficulties (Eisenberg, Cumberland, & Spinrad, 1998; Krause, Mendelson, & Lynch, 2003).

The more immediate effects of validation and invalidation have also been investigated. Several studies demonstrate the positive effects of validation and/or the negative effects of invalidation on emotions. For example, one study included healthy individuals and found that when faced with a stressful task, individuals who were invalidated reported significantly higher levels of negative affect, heart rate, and skin conductance over time than did individuals who were validated (Shenk & Fruzzetti, 2011). In a similar experiment (Greville-Harris, Hempel, Karl, Dieppe, & Lynch, 2016), invalidating feedback during a series of math stressor tasks (compared with validating or no feedback) increased participants’ physiological arousal and decreased their willingness to take part in a comparable experiment. These findings further speak in favor of using validation as a way to regulate emotions when communicating with pain patients (due to the negative emotions often part of the pain experience), but more empirical studies of the matter are needed.

In addition, the effects of validation and invalidation on emotional arousal and the expression of inner experiences in interpersonal interactions are summarized in the transactional model (Fruzzetti, 2006; Fruzzetti & Worrall, 2010). The transactional model explains how validation can enhance communication (see Figure 5), and it states that when a person’s experiences are validated, negative emotion decreases, making the person more likely to accurately express their experiences and disclose more in the conversation. This makes it easier to understand the other person, in turn making him/her easier to validate further. The transactional model also talks about the opposite scenario in which invalidating responses increase negative emotional arousal, which in turn is said to increase inaccurate expression (e.g., because secondary emotions hide the primary emotions or the other person stops disclosing his/her inner experiences since they were not met supportively). This leads to misunderstanding and further invalidation.
Summary and aims
The large amount of research investigating various aspects of emotion regulation has definitely contributed to knowledge of how to regulate emotions in functional ways. DBT has made a major contribution, highlighting problems with emotion regulation and exploring how to treat them in a clinical context through working with borderline personality disorder. However, the need for functional emotion regulation applies to many clinical populations in other contexts as well.

Based on this, the overall aim of this dissertation was to expand knowledge of how to use emotion-regulation strategies from DBT in helping patients in other clinical settings regulate their emotions. The main purpose was to build knowledge and provide recommendations regarding adaptive
emotion regulation for clinicians working with chronic pain patients and patients with treatment-resistant anxiety disorders.

This dissertation had numerous goals. A first goal was to investigate validation in the chronic pain context. This goal was approached in two settings: the chronic pain couples setting and the clinical chronic pain setting. The second goal was to investigate the feasibility and effectiveness of a DBT-inspired treatment for treatment-resistant anxiety patients.

**Specific aims**

I. Study I is an experimental study with the objective of studying validation in the chronic pain couple context. The aim was to investigate whether brief validation training for partners of people with chronic pain would result in more validating and fewer invalidating responses, and to investigate whether changes in these behavioral responses were associated with changes in positive and negative affect in the partner experiencing pain.

II. Study II is a prospective study with the overarching purpose of extending knowledge of the role of validation and invalidation in the chronic pain clinical context. The overall aim was to examine the relationship between perceptions of validation and invalidation, negative affectivity, pain, pain interference, and treatment outcome in a sample of chronic pain patients.

III. Study III is a single-case study in which patients with anxiety disorders for whom earlier CBT treatment had been unsuccessful received a DBT-inspired treatment (with a pronounced focus on functional emotion regulation). The aim was to investigate feasibility as well as the effects on emotion regulation and treatment outcome.
Short description of the studies

Study I
I See You’re in Pain – The Effects of Partner Validation on Emotions in People with Chronic Pain

Introduction
Having chronic pain not only entails dealing with physical pain, as associated emotional and marital difficulties are also common (Cano, Gillis, Heinz, Geisser, & Foran, 2004; Cano, Johansen, Leonard, & DeGroot-Hanawalt, 2005). This suggests that targeting both negative emotion and interpersonal functioning in couples that include a person with chronic pain might be helpful. One possible solution to this is validation, a way of communicating understanding, legitimacy, and acceptance of another person’s experience. Validation has been studied in chronic pain couples (Cano, Barterian, & Heller, 2008; Issner, Cano, Leonard, & Williams, 2012), but more knowledge is still needed. For example, the feasibility and effects of trying to increase validation and decrease invalidation in these couples have not been investigated. It is also not known whether a change in validation and invalidation is associated with changes in emotions in the partner with pain.

Aim
The aim of the first study was to investigate whether brief validation training for spouses would result in more validating and fewer invalidating responses towards their partners with pain. An additional aim was to investigate whether changes in these behavioral responses were associated with changes in emotion and pain level in the partners with pain. It was hypothesized that: 1) validating responses in the partners would increase and invalidating responses would decrease from pre to post training; and 2) increased validating and decreased invalidating responses from the partners would be associated with decreased negative affect and increased positive affect in the persons with pain. There were no hypotheses regarding pain level. The intervention was not considered extensive enough to affect pain intensity, and pain level was considered mainly to assess whether it spontaneously fluctuated, possibly affecting emotions; i.e., pain level was investigated indirectly to ensure that emotions did not change because pain changed.
**Design**
A within-group design with pre- and post-intervention measurements was implemented. Spouses of people with chronic pain received brief validation training without their partners’ knowledge, and interactions were video recorded before and after the intervention. For an overview of the procedure, see Figure 6.

![Figure 6. Overview of the procedure, specifically showing the different steps in the procedure for the person in pain and the partner.](image)

**Participants**
Twenty couples in which at least one partner suffered from chronic pain were included in the study. They were recruited in several ways, including
advertisements in the newspaper, at the university, and at the local hospital. Several participants were also contacted through telephone calls after having registered as interested in participating in chronic pain research.

**Measurements**
Partner conversations were video recorded before and after the training, and spouse-validating and -invalidating responses were rated using a reliable observational scale. In addition, the people in pain rated their emotional experiences as well as their level of pain before and after the validation training.

**Outcome measures**
Objective validation and invalidation were assessed using the Validating and Invalidating Behavior Coding Scale (VIBCS; Fruzzetti, 2001). To investigate changes in affect from before to after the validation training, the Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988) was used. The question “How much pain are you experiencing right now?” followed by a visual analogue scale ranging from 0 (no pain at all) to 5 (unbearable pain) was posed to detect a potential change in pain level.

**Couple information**
Self-reported quality of the couple relationship was assessed using the Quality of Dyadic Relationships (QDR-36; Ahlborg, Lilleengen, Lönnfjord, & Petersen, 2009) scale.

**Statistical analyses**
Dependent t-tests were conducted using data from the outcome measures. Within-group effect sizes were calculated for each dependent measure using Cohen’s d.

**Results**
Partners who received the brief validation training increased their validating and decreased their invalidating responses from pre to post intervention. The effect size was large for validation and medium for invalidation. Results indicated that negative affect in the people with chronic pain decreased from pre to post intervention, though this effect size was small. There was no significant change in positive affect or subjective pain intensity level in the people with pain. For an overview of these results, see Table 2.
Discussion and conclusions

The results of study I indicate that rather short validation training may be sufficient when one wants spouses of people with chronic pain to validate their partners more and invalidate them less. In turn, increased validation and decreased invalidation from the partner were associated with lowered negative affect in the people with pain. These results have important clinical implications. First, the results indicate that even a rather short intervention is enough to produce behavioral change in the partners, at least in the short term. Second, they indicate that validation from the partner can be used to effectively regulate negative emotions in people with chronic pain.

A finding that was not part of the stated aim of the present study, but was nonetheless important, concerned the balance between validation and invalidation found in the couples. When the interactions were coded, a pattern of low levels of both validation and invalidation was found. Couples with this interaction pattern often had a relatively disconnected way of responding to one another (Fruzzetti, 1996), possibly making it difficult to provide social support when outside stressors (such as pain) are present. This pattern has also been found in other chronic pain couples samples.

Table 2

Comparison of means (standard deviations) from pre- to post-intervention measurements of validation, invalidation, positive and negative affect, and pain intensity using a dependent t-test; N = 20.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pre M(SD)</th>
<th>Post M(SD)</th>
<th>ES</th>
<th>t(df)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Validating:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VIBCS</td>
<td>2.45(1.54)</td>
<td>3.85(1.35)</td>
<td>.97</td>
<td>-4.08(19)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Invalidation:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VIBCS</td>
<td>3.40(1.63)</td>
<td>2.50(1.43)</td>
<td>.59</td>
<td>2.27(19)</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Affect:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative affect</td>
<td>15.75(5.62)</td>
<td>14.10(4.83)</td>
<td>.32</td>
<td>1.76(19)</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Positive affect</td>
<td>30.50(8.55)</td>
<td>28.65(9.43)</td>
<td>.20</td>
<td>1.49(19)</td>
<td>.077</td>
</tr>
<tr>
<td>Pain intensity:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimated pain</td>
<td>2.35(0.81)</td>
<td>2.55(0.83)</td>
<td>.24</td>
<td>-1.71(19)a</td>
<td>.052</td>
</tr>
</tbody>
</table>

Note: N = number of participants; M = mean; SD = standard deviation; t = t-value; df = degrees of freedom; VIBCS = Validating and Invalidating Behavior Coding Scale.
a = two-tailed.
(Cano et al., 2008), indicating that couples interventions aimed at increasing validation can be a valuable complement to standard pain treatment.

Generally, the results were in line with our hypotheses: partner validation increased, invalidation decreased, and negative affect in the people with pain decreased. However, the pain participants did not report a significant increase in positive affect post intervention. In fact, there was a trend, although not significant, in the opposite direction. One should of course be cautious in drawing conclusions from insignificant results, but it is possible that fatigue (and increased discomfort or pain) resulting from the duration of the study participation played a role. It is also possible that a larger sample or more extensive training would yield another result.

To summarize, study I demonstrated that brief validation training was enough to increase validating responses and decrease invalidating responses from the partner in chronic pain couples. It also demonstrated that this was associated with regulated negative affect, indicating that validation from the partner can be used to regulate negative affect in people with chronic pain. However, the importance of communicating understanding has also been highlighted in clinical contexts when communicating with pain patients (Linton, 2015).
Study II
Pain Patients’ Experiences of Validation and Invalidation from Physicians Before and After Multimodal Pain Rehabilitation: Associations with Pain, Negative Affectivity, and Treatment Outcome

Introduction
Although helpful for many patients, there are limitations to all available chronic pain treatments. One potential area of improvement is communication between health care professionals and patients. The importance of effective communication in this context is known (Haskard-Zolnierek & DiMatteo, 2009; Stewart, 1995). One component of effective communication is validation. Validation is known to regulate negative emotions (Shenk & Fruzzetti, 2011), which is highly relevant in this context because pain patients commonly experience co-occurring emotional problems (Bair, Robinson, Katon, & Kroenke, 2003; Rode et al., 2006). Conversely, invalidation is associated with increased emotional arousal (Greville-Harris et al., 2016; Shenk & Fruzzetti, 2011) and has a negative impact on mental well-being and social functioning (Kool et al., 2010).

The need for and associated benefits of validation have been highlighted in the chronic pain context (Linton, 2015), but many questions remain unanswered. For example, it is unclear how patients’ perceptions of validation and invalidation relate to patients’ characteristics (e.g., negative affectivity and pain interference) and treatment outcomes.

Aim
Based on this, the overall purpose of this study was to examine the relationship between patient perceptions of validation and invalidation, negative affectivity, and treatment outcome. Specifically, the aim was to answer the following research questions. First, what are pain patients’ perceptions of validation and invalidation from their physicians before and after treatment? Second, are these perceptions stable or do they change? Third, do patients with different perceptions differ in terms of negative affectivity, pain, and pain interference? Finally, is there a relationship between perceived validation and invalidation (before and after treatment) and treatment outcome?

Design
The study had a prospective, longitudinal design, using self-report data from before and after treatment.
Participants
Patients were recruited at a pain rehabilitation clinic in Sweden. Patients were asked to complete self-report questionnaires at four time points: A) immediately before or in conjunction with the assessment visit to the rehabilitation physician, B) at the meeting with their rehabilitation physician before treatment start, C) at the meeting with their rehabilitation physician after treatment, and D) at one-year follow up.

In total, the pain rehabilitation clinic had 955 new patients seeking care during the data collection period, 535 of whom were offered treatment. Of these 535 patients, 395 choose to fill out questionnaires at one or more time points. To be included in this study, patients had to have rated perceived validation and invalidation from their physician both before and after treatment (time points B and C). In the end, this was done by 108 patients. To account for sampling bias, independent-samples t-tests were conducted to compare these 108 individuals with the remaining 285 who completed self-report questionnaires. This was done on pre-data for all measures used in the study. The only significant difference found between the included and excluded patients was in pain intensity, with the included group scoring significantly higher (M = 8.65, sd = 1.96) than the excluded group (M = 8.09, sd = 1.93; t(272) = 2.33, p < .05).

The included patients’ mean age was 45.50 years (range 21–62, sd = 10.26), 91% were born in Sweden, and 86% were female. The mean time since the first pain episode was 11.76 years (range 1–44, sd = 9.18). Most patients (74%) had generalized pain, defined as pain in more than six areas.

Measurements
Participants’ responses to the following measures from immediately before and immediately after treatment were used.

Measures used to form subgroups
The subgroups were identified based on the validation and invalidation subscales of the Validating and Invalidating Response Scale (VIRS; Lee & Fruzzetti; Lee, Lee, Hyun, & Fruzzetti, 2012). A modified and translated version of the original questionnaire was used.

Measures related to pain
Pain severity and pain interference were measured using two subscales from the Multidimensional Pain Inventory (MPI; Kerns, Turk, & Rudy, 1985).
Measures related to negative affectivity
Negative affect was measured using the short version of the Positive Affect Negative Affect Scale (PANAS; Hillerås, Jorm, Herlitz, & Winblad, 1998; Watson et al., 1988). The Hospital Anxiety and Depression scale (HAD; Zigmond & Snaith, 1983) was used to measure anxiety and depression. In addition, anxiety sensitivity was measured with the Anxiety Sensitivity Index (ASI; Reiss, Peterson, Gursky, & McNally, 1986) and pain catastrophizing was measured with the Pain Catastrophizing Scale (PCS; Sullivan, Bishop, & Pivik, 1995).

Missing values
In total, 4.31% of the items were missing from the dataset. A non-significant Little’s MCAR test, i.e., \( X^2 (10784) = 10262.88, p = 1.00 \), indicated that data were missing completely at random. To increase power for the follow up analyses, complete single imputation using the expectation maximization (EM) algorithm was used on all measures but VIRS. For VIRS, single imputation was done only if the individual had less than 20% of the items missing at one time point.

Statistical analyses
Cluster analysis was used to identify subgroups of patients before and after treatment. To investigate stability and movement between subgroups over time, the EXACON procedure in Sleipner (Bergman, Magnusson, & El Khouri, 2003) was used. Furthermore, differences between the clusters in pain severity, pain interference, and negative affectivity were investigated using one-way between-groups multivariate analysis of variance (MANOVA). In case of a significant MANOVA result, the analyses were followed by separate univariate analyses (ANOVA) using Hochberg’s GT2 as the post hoc tests.

To determine whether the cluster belonging before treatment could predict treatment outcome, a repeated-measures MANOVA (with time as the within-subject factor and cluster belonging as the between-subject factor) was conducted. Pain interference, anxiety, and depression were considered outcome measures. Hochberg’s GT2 was used for post hoc analyses. Then, to investigate the relationship between perceived validation and invalidation after treatment and treatment outcome, a MANCOVA was conducted. Cluster belonging was the independent variable and pain interference, depression, and anxiety were considered outcome measures.
Total scores on the outcome measures from before treatment were included in the analysis as covariates to control for pre-scores.

**Results**

Both before and after treatment, a three-cluster solution was considered most appropriate. This cluster solution identified a group that perceived high levels of validation and low levels of invalidation from their physicians (i.e., the heightened-validation/low-invalidation cluster) and a small group that perceived the opposite (i.e., the heightened-invalidation/low-validation cluster). Between these two more extreme groups was another cluster displaying moderate scores (related to the full sample in the present study) on validation and invalidation (i.e., the moderate validation and invalidation cluster).

Furthermore, patients normally belonged to the same group both before and after treatment, although there were some movements between clusters (see Figure 7).
Figure 7. Stability and movement between clusters from before (first column) to after (second column) treatment. Bold arrows show typical paths and dashed arrows show atypical paths, p < .05.

No significant differences were found between the clusters for pain, pain interference, or any of the measures assessing negative affectivity before treatment (see Table 3). However, after treatment, the heightened-invalidation cluster stood out as more problematic, scoring significantly worse than the heightened-validation cluster on all dependent variables except pain severity. The heightened-invalidation cluster also scored significantly worse on negative affect, anxiety, and anxiety sensitivity than did the moderate cluster (see Table 4).
Table 3
Comparisons between the clusters on measures of negative affect, anxiety and depression, pain severity, pain interference, anxiety sensitivity, and pain catastrophizing before treatment.

<table>
<thead>
<tr>
<th></th>
<th>Negative affect</th>
<th>Anxiety</th>
<th>Depression</th>
<th>Pain severity</th>
<th>Pain interference</th>
<th>Anxiety sensitivity</th>
<th>Pain catastrophizing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heightened invalidation/low validation</td>
<td>11.69 (5.17)</td>
<td>9.60 (4.34)</td>
<td>9.50 (4.46)</td>
<td>9.12 (2.58)</td>
<td>53.63 (10.14)</td>
<td>15.23 (9.34)</td>
<td>22.12 (12.57)</td>
</tr>
<tr>
<td>Moderate validation and invalidation</td>
<td>11.76 (4.71)</td>
<td>9.19 (5.67)</td>
<td>9.05 (4.50)</td>
<td>8.59 (1.98)</td>
<td>49.41 (11.48)</td>
<td>14.88 (11.90)</td>
<td>22.67 (9.91)</td>
</tr>
<tr>
<td>High validation/low invalidation</td>
<td>11.05 (4.44)</td>
<td>8.11 (5.04)</td>
<td>8.04 (4.51)</td>
<td>8.57 (1.72)</td>
<td>48.15 (12.22)</td>
<td>13.44 (9.59)</td>
<td>22.48 (11.13)</td>
</tr>
<tr>
<td>Total</td>
<td>11.38 (4.62)</td>
<td>8.70 (5.16)</td>
<td>8.60 (4.50)</td>
<td>8.66 (1.94)</td>
<td>49.39 (11.73)</td>
<td>14.20 (10.34)</td>
<td>22.49 (10.86)</td>
</tr>
</tbody>
</table>

F-value: .30<sup>ns</sup> .77<sup>ns</sup> .94<sup>ns</sup> .53<sup>ns</sup> 1.36<sup>ns</sup> .31<sup>ns</sup> .01<sup>ns</sup>

Note: Data are presented as mean (standard deviations). NA, Negative affect; HAD, Hospital Anxiety and Depression Scale; MPI, Multidimensional Pain Inventory; ASI, Anxiety Sensitivity Index; PCS, Pain Catastrophizing Scale; ns, non-significant.
Table 4

Comparisons between the clusters on measures of negative affect, anxiety and depression, pain severity, pain interference, anxiety sensitivity, and pain catastrophizing after treatment.

<table>
<thead>
<tr>
<th></th>
<th>Negative affect (NA)</th>
<th>Anxiety (HAD)</th>
<th>Depression (HAD)</th>
<th>Pain severity (MPI)</th>
<th>Pain interference (MPI)</th>
<th>Anxiety sensitivity (ASI)</th>
<th>Pain catastrophizing (PCS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heightened invalidation/low validation</td>
<td>15.10 (5.17)</td>
<td>11.16 (3.84)</td>
<td>9.60 (4.35)</td>
<td>8.62 (1.87)</td>
<td>52.85 (10.09)</td>
<td>24.57 (10.49)</td>
<td>27.26 (11.06)</td>
</tr>
<tr>
<td>Moderate validation and invalidation</td>
<td>10.26 (4.55)</td>
<td>7.19 (4.58)</td>
<td>7.97 (4.32)</td>
<td>7.98 (2.26)</td>
<td>45.76 (11.87)</td>
<td>11.32 (9.55)</td>
<td>20.60 (10.14)</td>
</tr>
<tr>
<td>High validation/low invalidation</td>
<td>10.39 (3.78)</td>
<td>7.94 (4.05)</td>
<td>6.55 (3.43)</td>
<td>7.91 (2.20)</td>
<td>44.50 (11.27)</td>
<td>12.84 (8.46)</td>
<td>20.32 (8.94)</td>
</tr>
<tr>
<td>Total</td>
<td>11.00 (4.57)</td>
<td>8.10 (4.39)</td>
<td>7.53 (4.03)</td>
<td>8.04 (2.18)</td>
<td>46.15 (11.60)</td>
<td>13.88 (10.09)</td>
<td>21.39 (9.92)</td>
</tr>
<tr>
<td>F-value</td>
<td>7.97***</td>
<td>4.90**</td>
<td>3.93*</td>
<td>.63***</td>
<td>3.17*</td>
<td>12.12***</td>
<td>3.19*</td>
</tr>
<tr>
<td>Post-hoc</td>
<td>1&gt;2,3</td>
<td>1&gt;2,3</td>
<td>1&gt;3</td>
<td>1&gt;3</td>
<td>1&gt;2,3</td>
<td>1&gt;3</td>
<td></td>
</tr>
</tbody>
</table>

Note: Data are presented as means (standard deviation). Post-hoc analyses were performed with Hochberg’s GT2. NA, Negative affect; HAD, Hospital Anxiety and Depression Scale; MPI, Multidimensional Pain Inventory; ASI, Anxiety Sensitivity Index, PCS, Pain Catastrophizing Scale; ns, non-significant. *p < .05, **p < .01, ***p < .001.
In relation to treatment outcome, the whole sample significantly improved in terms of pain interference and depression. However, no significant interaction effects were found between cluster belonging and time in any of the outcome measures, indicating that cluster belonging before treatment did not predict treatment outcome. Looking more closely at the relationship between cluster belonging after treatment and treatment outcome, no significant differences were found between the three clusters in any of the outcome measures.

Post hoc analyses
There were significant differences between the clusters after treatment, but not before. At first glance, this was difficult to understand; however, individual movement between the clusters was considered a possible explanation for this. Although our results indicated that it was typical to remain in the heightened-invalidation cluster even after treatment, about half of the patients had been replaced by patients from the moderate cluster. The heightened-invalidation cluster therefore did not contain the same individuals before and after treatment, which likely explained the differences found after treatment but not before. This raised a second question: Why did some individuals change clusters? Generally, patients met the same physician both before and after treatment, so seeing a different physician with a different response style was not thought to be the explanation. Instead, the reason for remaining in the same cluster or moving between clusters was thought to be related to improvement or worsening of negative affectivity or pain. To investigate this, post hoc analyses were conducted. The patients found in the heightened-invalidation cluster both before and after treatment (called Group 1), the patients who moved from the heightened-invalidation cluster to the moderate cluster (Group 2), and the patients who moved from the moderate cluster to the heightened-invalidation cluster (Group 3) were investigated more closely. Specifically, within-group changes in these three groups of patients were explored using Wilcoxon signed-rank tests. These analyses were used to examine whether there were significant differences between pre-treatment and post-treatment scores on negative affectivity, pain intensity, and pain interference in these three groups.

Only two of the Wilcoxon signed-rank tests revealed significant reductions in scores, specifically, pain catastrophizing for Group 1 and pain interference for Group 3 (see Table 5). This indicates that improvement or worsening of negative affectivity or pain interference was not related to
switching between the clusters. However, a closer look at between-group differences investigating the median values of the three groups revealed that the individuals who moved from the heightened-invalidation cluster after treatment (Group 2) scored noticeably lower than did the other two groups on emotional problems and pain interference. Specifically, inspecting the median values revealed that eight individuals scoring high on emotional problems stayed in the heightened-invalidation cluster, eight individuals scoring low on emotional problems moved from the heightened-invalidation cluster to the moderate cluster, and seven individuals with high emotional problems moved from the moderate cluster to the heightened-invalidation cluster. Overall, this indicated that patients scoring high on negative affectivity ended up in the heightened-invalidation cluster after treatment.
Table 5

Medians and Z values for pain interference, pain severity, and negative affectivity for the individuals found in the heightened invalidation cluster both before and after treatment (Group 1, N=8), the individuals who moved from the heightened invalidation cluster to the moderate validation and invalidation cluster (Group 2, N=8), and the individuals who moved from the moderate validation and invalidation cluster to the heightened invalidation cluster (Group 3, N=7).

<table>
<thead>
<tr>
<th></th>
<th>Group 1 Before treatment</th>
<th>Group 1 After treatment</th>
<th>Group 2 Before treatment</th>
<th>Group 2 After treatment</th>
<th>Group 3 Before treatment</th>
<th>Group 3 After treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Median</td>
<td>Median</td>
<td>Z</td>
<td>Median</td>
<td>Median</td>
<td>Z</td>
</tr>
<tr>
<td>Pain interference</td>
<td>58.50</td>
<td>61.00</td>
<td>-.70&lt;sup&gt;ns&lt;/sup&gt;</td>
<td>50.01</td>
<td>55.00</td>
<td>-.25&lt;sup&gt;ns&lt;/sup&gt;</td>
</tr>
<tr>
<td>Anxiety</td>
<td>11.00</td>
<td>11.00</td>
<td>-.51&lt;sup&gt;ns&lt;/sup&gt;</td>
<td>8.50</td>
<td>9.00</td>
<td>-.35&lt;sup&gt;ns&lt;/sup&gt;</td>
</tr>
<tr>
<td>Depression</td>
<td>10.50</td>
<td>8.50</td>
<td>-1.05&lt;sup&gt;ns&lt;/sup&gt;</td>
<td>7.68</td>
<td>8.50</td>
<td>-1.28&lt;sup&gt;ns&lt;/sup&gt;</td>
</tr>
<tr>
<td>Pain severity</td>
<td>10.00</td>
<td>8.50</td>
<td>-1.02&lt;sup&gt;ns&lt;/sup&gt;</td>
<td>9.46</td>
<td>9.00</td>
<td>-1.32&lt;sup&gt;ns&lt;/sup&gt;</td>
</tr>
<tr>
<td>Anxiety sensitivity</td>
<td>20.50</td>
<td>20.50</td>
<td>-0.42&lt;sup&gt;ns&lt;/sup&gt;</td>
<td>8.50</td>
<td>8.50</td>
<td>-1.35&lt;sup&gt;ns&lt;/sup&gt;</td>
</tr>
<tr>
<td>Pain catastrophizing</td>
<td>25.00</td>
<td>24.17</td>
<td>-2.03&lt;sup&gt;*&lt;/sup&gt;</td>
<td>16.50</td>
<td>17.71</td>
<td>-1.12&lt;sup&gt;ns&lt;/sup&gt;</td>
</tr>
<tr>
<td>Negative affect</td>
<td>13.50</td>
<td>16.15</td>
<td>-0.84&lt;sup&gt;ns&lt;/sup&gt;</td>
<td>8.00</td>
<td>8.80</td>
<td>-1.19&lt;sup&gt;ns&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Note: *p<.05, ns = non-significant.
Discussion and conclusions
Most patients experienced high levels of validation and low levels of invalidation. However, a smaller group perceived heightened levels of invalidation in combination with low levels of validation. Typically, these patient perceptions were stable over time, but there were also movements between the clusters. In comparison with the other patients, the heightened-invalidaton cluster scored significantly higher on negative affectivity and pain interference after treatment, but not before. Post hoc analyses revealed that a change of cluster could be related to higher negative affectivity and pain interference, with patients scoring high on emotional measures and pain interference ending up in the heightened-invalidaton cluster after treatment. Looking at treatment outcome, the whole sample improved in pain interference and depression, but no differences were found between clusters regarding change in outcome variables. Overall, these results point to the importance of physician validation and invalidation when communicating with pain patients with high levels of negative affectivity and pain interference.

Patients who experienced heightened levels of invalidation also experienced significantly more negative affectivity than did the other two groups, which speaks in favor of a relationship between the heightened-invalidaton/lowl-validation cluster and measures related to negative affectivity. Confusingly, this relationship seemed to exist only after treatment, but it was explained by the individual movements between the clusters. Closer investigation of the individuals who moved between clusters revealed that such movements made the heightened-invalidaton cluster more homogeneous in terms of negative affectivity after treatment. One possible explanation for the relationship between validation/invalidation and negative emotions can be found in the transactional model (Fruzzetti & Worrall, 2010). This model specifies that heightened emotional arousal in patients leads to inaccurate expression of inner experiences. Inaccurate expression then increases the risk of invalidation from other people, which further increases negative emotional arousal creating a vicious cycle. Based on this model, it is likely that these patients not only experienced invalidation from their physicians, but also from other people in their surroundings.

Unexpectedly, no relationship was found between perceived validation/invalidation and change in outcome variables, possibly due to a problem with statistical power. Another possibility is that the patient–physician interactions that the patients rated took place immediately before
and immediately after treatment, and individual contact with the physician during treatment was very limited. The results might have been different if the patients had instead rated the health care professionals whom they met with throughout the treatment. This matter needs to be investigated further.

Overall, this study has implications for clinical practice, since comorbid emotional problems and level of pain interference may disrupt effective communication. It demonstrates that validation is important in a clinical context when communicating with pain patients. Besides validation, many other possible emotion-regulation strategies are available, and since other people are not always present, it is also important to teach patients with emotion-regulation difficulties how to regulate their own emotions.
Study III
Dialectical Behavior Therapy to Augment Standard Cognitive Behavioral Therapy for Treatment-Resistant Anxiety Disorders: A Replicated Single-Subject Pilot Study

Introduction
CBT with exposure as a main focus is effective for many, but unfortunately not all, patients suffering from anxiety disorders. One possible explanation for a lack of positive treatment results is deficits in emotion regulation in these patients. Problems with emotion regulation are well known in anxiety (Campbell-Sills & Barlow, 2007; Kring & Bachorowski, 1999), which supports paying extra attention to these problems during treatment. It has been suggested that DBT may be a valuable treatment alternative for patients for whom standard CBT is ineffective (Welch et al., 2010). However, studies investigating this are lacking.

Aim
Based on this, the aim of this study was to investigate the feasibility and effectiveness of a DBT-inspired treatment for patients for whom earlier CBT had been unsuccessful.

Design
A repeated single-case design with three to five weeks of baseline measures followed by 24 weeks of treatment (divided into a skill-training phase and an exposure phase) was implemented. Data were collected repeatedly and continuously from the baseline, through the treatment phases, and at the six-month follow up.

Participants
Patients were recruited at psychiatric outpatient clinics in Örebro, Sweden. Inclusion criteria were ≥18 years old, diagnosed with an anxiety disorder, and previously unsuccessful CBT. Exclusion criteria included severe depression, a psychotic disorder, or a documented neuropsychiatric disorder. Patients were also excluded if they had recently started psychopharmacological treatment. In total, five patients were screened and all met the inclusion criteria. One of the five recruited patients declined participation, so the treatment process and results will be described for four patients in total. Of these four patients, three completed treatment and one dropped out.
Patient 1, Anne, was in her 30s and had received treatment from specialized psychiatric care on and off for about 15 years. Recently, she had received more than 30 CBT sessions for her anxiety. At the start of this treatment, Anne met criteria for four different anxiety disorders, i.e., panic disorder without agoraphobia, several specific phobias, generalized anxiety disorder, and hypochondriasis. Her main complaints were panic attacks and fear of panic attacks. For many years, Anne had been successful in hiding her anxiety from friends and co-workers but recently she felt her anxiety getting worse and hiding it had become more difficult.

Patient 2, Linda, was in her 40s and had been on sick leave from work and in contact with specialized psychiatric care for about 20 years. In total, she had received about 60 CBT sessions for anxiety, without lasting improvement. At the start of treatment, she met criteria for major depressive disorder (recurrent, current episode unspecified), panic disorder without agoraphobia, and multiple specific phobias. Her main complaints were overwhelming emotions and constant and intense anxiety. She also experienced considerable shame as a result of her anxiety problems and current life situation.

Patient 3, Tina, was in her 20s and had been in treatment in psychiatric care for three years. In total, she had received about 20 CBT sessions for anxiety. At the start of treatment, she met criteria for obsessive compulsive disorder (OCD), panic disorder without agoraphobia, dysthymic disorder, PTSD, generalized anxiety disorder (GAD), and eating disorder, not otherwise specified. Her main complaint was her OCD, and she spent approximately four to six hours each day on her personal hygiene and cleaning her home. Tina dropped out of treatment after 12 sessions.

Patient 4, Sophie, had never been able to work due to mental health issues and was now in her 50s. At the start of treatment, Sophie met criteria for panic disorder with agoraphobia, specific phobia, and major depressive disorder (recurrent, current episode moderate). Prior to this treatment, she had received 18 CBT sessions for anxiety problems. She described more or less constant anxiety that intensified in public places, and she described intense panic attacks that she controlled using benzodiazepines (which she had done for many years). According to her own report, she was unable to leave her home without taking benzodiazepines.

**Measurements**

To measure feasibility, the number of patients interested in the study, number of patients who qualified for treatment, drop-out rate, number of
completed treatment sessions for each patient, and number of completed homework assignments for each patient are presented. To draw conclusions about treatment effectiveness, data were collected through both daily and weekly repeated measures at baseline, during both treatment phases, and at follow up six months after completed treatment. In addition, emotion regulation and mindfulness were assessed before and after baseline as well as before and after both treatment phases and at follow up (a total of five times). Also, diagnostic interviews were conducted before and after treatment.

Daily measures
A shortened and adapted version of the Social Phobia Weekly Summary Scale (Clark et al., 2003) was administered to patients in order to measure daily fluctuations in anxiety and avoidance.

Weekly measures
The Overall Anxiety Severity and Impairment Scale (OASIS) measuring the severity of and impairment due to anxiety was administered to patients once a week (Norman, Hami-Cissell, Means-Christensen, & Stein, 2006). Also, patients completed the Overall Depression Severity and Impairment Scale (ODSIS) every week to measure the severity of and impairment due to depressive symptoms (Bentley, Gallagher, Carl, & Barlow, 2014).

Before and after baseline, each phase, and at follow up
The Five Facet Mindfulness Questionnaire (FFMQ) was used to assess mindfulness (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). The Difficulties in Emotion Regulation Scale (DERS) was used to measure difficulties in emotion regulation (Gratz & Roemer, 2004).

Before and after treatment
To assess change in diagnostic status, Structured Clinical Interviews for DSM-IV-I (SCID-IV-I; First, Spitzer, Gibbin, & Williams, 1997) were conducted before and after treatment. The interviews were led by a licensed psychologist (blind to the purpose and design of the study) who had experience using the instrument.

Data analyses
In single-case designs, participants serve as their own controls to permit conclusions about change to be drawn. Data collected during the baseline
phase were used as a benchmark and compared with data from the treatment phases and at follow up. Visual inspection was used to analyze the daily and weekly measures. The analyses were complemented by also calculating PEM, i.e., the percentage of data points exceeding the median (Ma, 2006).

Results

Treatment feasibility
In total, five patients showed an interest in participating, fulfilled the inclusion criteria, and were offered treatment. Of these patients, three completed all sessions, one dropped out after 12 sessions, and one did not enter treatment. Anne completed all 24 homework assignments, Linda completed 23, and Sophie completed 22. Tina completed five of the 10 assignments she received.

Outcome measures

Mindfulness
Evaluation of mindfulness scores indicated improved mindfulness skills in two (Anne and Linda) of the three patients who completed treatment (see Figure 8).
Figure 8. Graphical presentation of mindfulness.
Emotion-regulation difficulties
Regarding emotion-regulation difficulties, all patients reported severe problems before treatment started. After treatment, all three patients who completed treatment reported decreased difficulties with emotion regulation (Figure 9), for Anne, even to non-clinical levels.

![Graphical presentation of emotion-regulation difficulties.](image)

Figure 9. Graphical presentation of emotion-regulation difficulties.
Daily anxiety and avoidance

It is difficult to visually detect any clear changes in daily anxiety and avoidance (Figure 10) in any of the patients. However, PEM analyses indicate some positive results. Overall, treatment was effective in reducing daily anxiety and avoidance for Anne, but positive results for the other patients were generally lacking. However, there were some positive effects on avoidance in Linda.

Figure 10. Graphical presentation of daily anxiety and avoidance.
Figure 10b. Graphical presentation of daily anxiety and avoidance.
Anxiety and depression severity and impairment

Visual inspection of OASIS (Figure 11) indicates decreasing trends in anxiety severity and impairment during the skill-training phase in all patients but Sophie. Overall, treatment was effective in reducing depression severity and impairment (ODSIS) in only one patient, Anne (Figure 11).

![Figure 11. Graphical presentation of overall anxiety and depression severity and impairment.](image)
Figure 11b. Graphical presentation of overall anxiety and depression severity and impairment.

Diagnostic status
In Anne and Linda, there were also positive changes in terms of anxiety when looking more closely at their diagnoses before and after treatment. However, treatment was not successful in treating comorbid mood disorders. Overall, these results indicate that augmenting standard CBT with emotion-regulation strategies from DBT may be a valuable approach for these patients, and is worth investigating and developing further.

Discussion and conclusions
Results indicate that augmenting standard CBT with emotion-regulation skills training from DBT is promising and may be helpful for treatment-resistant anxiety patients. In terms of feasibility, the treatment is acceptable, although there is room for improvement when it comes to adherence.
Emotion-regulation difficulties decreased in all patients and mindfulness increased in two of three patients who completed treatment. Some improvements were even in line with non-clinical levels. Regarding anxiety symptoms, results were more mixed. Overall, treatment was effective in one of the three patients who completed treatment, and successfully targeted anxiety on a diagnostic level in two of the patients. Treatment did not successfully target comorbid mood disorders.

It is important to note that this was a very difficult-to-treat sample, and that all patients had severe anxiety psychopathology as well as co-occurring difficulties that had persisted for many years. In addition, CBT had previously failed to improve their symptoms. This should be taken into consideration when interpreting the results. Specifically, it is indeed positive that difficulties with emotion regulation decreased in all patients and that mindfulness increased in two of the three patients who completed treatment. These positive effects should be seen as central in efforts to promote change and coping with anxiety in the long run.

A few limitations and strengths are worth mentioning. First, all patients were women, which lowers the external validity and makes it difficult to draw conclusions about gender differences and treatment results for men. Also, one of the four patients chose to prematurely discontinue treatment. Adding interventions to decrease the risk of drop-out in these patients would be important. It is also a limitation that the same therapist treated all patients, as this might be a threat to external validity. The most obvious strength is that the participants were all “real” patients recruited in psychiatric outpatient clinics, which increases external validity. In other words, these are the sort of patients whom clinicians meet in their day-to-day work and likely struggle to help, often failing to attain positive treatment results. Based on these results, it is likely that this treatment will also be effective for other similar patients.

Nonetheless, although helpful for some patients, our findings clearly suggest that further work and modifications to the treatment approach are needed, mainly to prevent patients from dropping out and to increase positive results for those who remain in treatment. Examples of possible improvements include increasing the number of exposure sessions, adapting the skills training more to each patient, and considering full DBT with anxiety as a main target for patients whose problems are severe enough. Future development of the treatment also needs to address various co-occurring problems.
In conclusion, this study provides important information to support the ongoing effort to find an effective treatment alternative for patients suffering from treatment-resistant anxiety. Augmenting traditional CBT with DBT skills and strategies is promising but needs to be developed further. Also, emotion regulation is clearly a variable of interest and warrants further study.
Ethical considerations

Ethical considerations were taken into account throughout the process of preparing this dissertation. Participation in all three studies was voluntary and all participants signed an informed consent before entering the study. All participants were informed of the conditions for participating before agreeing to participate. They were also informed of their right to end participation at any time without having to give a reason for doing so. In addition, all information about study participants was kept confidential and data were published in a way that ensured that no participant could be identified. The procedure and implementation of studies II and III received approval from the Ethical Review Board in Uppsala, Sweden. Study I was conducted according to the current ethical principles for clinical research stated in the Declaration of Helsinki (World Medical Association, 2008).

A more specific ethical consideration relevant to study I is that partners received validation training and were instructed to validate their partner who experienced pain without the other person knowing about it. This was considered necessary in order to collect data that was not biased by pain partner expectations. To compensate for this, after the last video recording, both partners were thoroughly informed of what had happened throughout the experiment, and information about validation was also given to the partner with pain. In addition, the couple received detailed written information about validation, its purpose, and how to practice it.

Regarding study III, there were no available studies supporting the effectiveness of the treatment we were offering. However, DBT was known as an effective treatment, just not specifically for the problems that these patients were presenting. In addition, there were no known risks of participating in the study. This formed our view that the clinical and scientific benefits outweighed the possible risks of participating. In addition, almost all patients included in study III were not currently engaged in a specific treatment in psychiatric care, since previous treatment attempts had failed. Participating in the study gave them a treatment opportunity that otherwise would not have been an option for them.
**General discussion**

**Main findings**
Based on study I, we know that brief validation training could be enough to increase validating and decrease invalidating responses in partners of people with chronic pain, at least in the short term. We also know that this was associated with a decrease in negative affect in the people with chronic pain. Results also revealed a balance between validation and invalidation in these couples that gives reason for concern. As a group, they scored low on both validation and invalidation before the training, an interaction pattern also found in previous research into pain couples (Cano et al., 2008). In the literature, this response pattern is described as avoidant (Fruzzetti, 1996), indicating that these couples are less likely to engage in destructive conflicts but have a relatively disengaged way of acting towards each other. This indicates that low validation was an existing problem in the context of these chronic pain couples, which could likely be targeted by training the couples to increase validation and decrease invalidation. This in turn would be associated with the regulation of negative emotions in people with pain.

In study II, we were able to demonstrate that most pain patients in specialized pain care feel validated and understood when they communicate with their rehabilitation physician. However, a smaller group has a different experience: low levels of validation and heightened levels of invalidation. In general, these perceptions are stable over time, although there are patients whose perceptions change. In addition, the heightened-invalidation group reported significantly more pain interference and negative affectivity after treatment (but not before) than did the other patients. Lastly, we could not find a relationship between perceived validation/invalidation from the rehabilitation physician and treatment outcome.

Unexpectedly, differences between the clusters were found only post treatment. This was because, due to movements between the clusters, the pre and post clusters did not contain the same individuals. Investigations have demonstrated that patients scoring high on negative affectivity and pain interference are more likely to end up in the heightened-invalidation cluster after treatment. These results suggest that it is important to pay attention to comorbid psychological problems and the level of pain interference, since these factors may have a negative impact on effective communication, and that a focus on decreasing invalidating responses
and/or increasing validating ones might be particularly important for patients with high levels of negative affect and pain interference.

Based on the results of study III, we could conclude that adding treatment strategies from DBT (before exposure) is feasible, although there is room for improvement when it comes to adherence. Related to outcome, the treatment was effective in decreasing problems with emotion regulation in all treatment-completing patients. Regarding anxiety and avoidance, the results were positive for one of the patients who completed treatment, mixed for the second, and lacking for the third. This indicates that targeting emotion-regulation difficulties may be a useful secondary treatment strategy for these very difficult-to-treat patients, but that it is not helpful for everyone. Modifying the treatment is recommended and should include, for example, increasing the number of exposure sessions, making the skills training more efficient, and increasing the use of phone coaching.

**Theoretical implications**

In the introduction, information about how emotions are generated and regulated was introduced. Learning theory was presented as an overarching framework explaining how emotions are shaped, reinforced, and punished by the environment as well as by factors within the individual. Learning theory was also used to explain some of the processes involved when people regulate their emotions. Learning theory is therefore relevant both when dysfunctional emotion-regulation strategies and functional emotion-regulation strategies are formed. More specific models describing the emotion-generation process and the emotion-regulation process were then presented. Finally, a more specific theoretical model of the effects of validation and invalidation in the moment was introduced. Learning theory and the models describing emotion generation and regulation are very general, and this field is extremely broad. The research presented here does not present any new evidence regarding how people in general best regulate their emotions. However, it does provide information about this in new contexts.

Study I demonstrated that validation (in this case from the partner) is associated with regulated negative emotions in people with chronic pain. This is in line with what has been found in previous studies (Greville-Harris et al., 2016; Linton, Boersma, Vangronsveld, & Fruzzetti, 2012; Shenk & Fruzzetti, 2011), and further supports the finding that validation from another person down-regulates negative emotions. This raises interesting and important questions: Why is that? What are the mechanisms behind
validation and its regulating effect on negative emotions? There is as yet no clear answer, and multiple explanations are likely. As already pointed out in the introduction, one suggestion is that validation communicates safety (Fruzzetti, 2006). Related to that, from an evolutionary perspective given that humans are social beings, getting confirmation from others that we are accepted and are not at risk of being excluded may have a soothing effect. In contrast, invalidation might be perceived as a threat that activates parts of the fight-flight system. From a biological perspective, it might also be that being validated releases certain hormones, such as oxytocin and serotonin, which have a calming effect on our bodily system. Studies investigating this are lacking, however, and the more biological effects of validation and invalidation would be an interesting field of study in the future. Another possible explanation is that validation in some cases hinders or stops the suppression of emotions. Although results are mixed, some research has found that suppression is associated with increased physical arousal (Campbell-Sills et al., 2006). It is possible that validation, which instead communicates acceptance, hinders or stops suppression of an emotion because it communicates that the emotion is valid and should instead be experienced and expressed. If this is true, validation may allow the emotion to exist, creating exposure to the emotional experience.

Previous research has also found a negative effect of invalidation on emotional arousal. The question of why is also relevant here. Besides the theories already mentioned, the answer might concern judgments. Judgments have a significant and immediate negative impact on emotion (Fruzzetti et al., 2009). Invalidating another person’s experiences communicates that one does not agree with and looks down on that experience, which would often be considered judgmental. Because of this, invalidating communication might increase emotional arousal. It has also been suggested that invalidation may lead to increased expression of secondary emotions, such as anger and shame (Fruzzetti, Shenk, & Hoffman, 2005), which may have a negative impact on emotional arousal. The example of anger as a secondary emotional response illustrates this clearly. Imagine experiencing sadness because life circumstances have recently made life difficult. Your grandmother recently died and you have just found out that you will no longer have a job after the summer. Instead of providing support, your friend invalidates your sadness and tells you that “sadness isn’t going to help” and to “think positively.” This creates the secondary emotion of anger. You now no longer only experience sadness,
but are also angry with your friend. In this way, invalidation may increase emotional arousal.

For the pain patients in study I, increased validation and decreased invalidation were not associated with an increase in positive affect. This result was not in line with our hypothesis. Instead, there was an insignificant trend in the opposite direction that perhaps is best explained by large variance. The variance for positive affect (pre = 73.10, post = 89.08) was more than twice the variance for negative affect (pre = 31.56, post = 23.36). Possibly, either a larger sample or a more extensive intervention might have lead to different results. Two other possibilities, not mentioned in the original article, are that the participants for some reason tended to have a general reduction in overall affect from before to after the intervention, or that they, for example, due to testing effects, reported less affect after the intervention. Because a control group is missing, such explanations can unfortunately not be excluded. On the other hand, the same insignificant result in positive affect was also found in a study of the effects of brief validation training of partners of people suffering from depression (Fantozzi & Fruzzetti, unpublished manuscript). This suggests that perhaps one should not expect significant changes in positive affect following increased partner validation and decreased invalidation in such brief interactions. Until this is investigated in greater detail, it is safe to say that brief validation training will not be enough to increase positive affect, but is indeed enough to decrease negative affect.

Also worth mentioning is that, due to the brevity of the intervention, there was no hypothesis regarding pain intensity level. Looking more closely at the results, however, reveals a marginally significant \( p = .052 \) increase in pain intensity from pre to post intervention. As mentioned, one should be cautious in interpreting insignificant results, but, in general, this trend is unsurprising. Participating in the experiment was demanding for many of the pain participants, as, for example, it required them to sit still for about two hours, making this trend understandable.

The results of study II, investigating the occurrence of subgroups of patients based on perceived validation and invalidation from their physicians, enable discussion of the various possibilities regarding balance between perceived validation and invalidation in a conversation. In previous studies, validation and invalidation have been found to be inversely and modestly correlated (Fruzzetti, Shenk, Lowry, & Mosco, 2005). In theory, this suggests that it is possible to be low or high on both. In study II, validation and invalidation were found to be strongly correlated, with \( r = -\)
before treatment and $r = -0.72^{**}$ afterwards. This suggests that if one perceives high validation from another person, one usually also perceives low invalidation, and vice versa. This is also found in the cluster analysis, with no cluster scoring high or low on both validation and invalidation. Of course, there might be differences between populations and contexts, but in this sample it was very uncommon to perceive high levels of both validation and invalidation in the same conversation. The reason for this is interesting to consider in detail. One reason might be related to the brief contact with a new person rated in this particular case. It is possible that conversations with a new person are more “either/or” than are interactions with people known for a longer time and with whom one has interacted more often.

Results of study II also support a relationship between validation/invalidation and emotions, although the study design makes it difficult to be certain about the direction of the causality. It is interesting to hypothesize about the reasons for this relationship, and the transactional model (Fruzzetti & Worrall, 2010) provides a framework for doing this. As the model specifies, perhaps psychological distress and validation/invalidation are related because it is more difficult to understand and validate patients when they are not just suffering from pain, but also from negative emotionality such as depression, fear, and pain catastrophizing. In other words, patients presenting more complex problems are more difficult to understand and accurately validate. This might be because it is more difficult for physicians to understand the full extent of such patients’ problems, and possibly because it is more difficult for such patients to understand themselves and accurately express their inner experiences. For example, patients might express a different emotion from the one experienced because they fear being evaluated negatively, or are so upset that they fail to be aware of important aspects of their emotional experience.

The relationship between validation/invalidation and negative emotions might also exist because experiencing intense negative emotions can make it difficult to take in and process information properly (Ellenbogen, Schwartzman, Stewart, & Walker, 2002; Yiend, 2010). One example is selective attention. Several studies demonstrate that selective attention is sensitive to affective and motivational states (Derryberry & Tucker, 1994; McNally, 1998; Reed & Derryberry, 1995). Vulnerability to negative emotions is associated with attentional bias towards negative/aversive information, in both clinical and non-clinical populations (Bar-Haim, Lamy, Pergamin, Bakermans-Kranenburg, & Van IJzendoorn, 2007; Tata,
Leibowitz, Prunty, Cameron, & Pickering, 1996). Invalidation from another person can be seen as an aversive stimulus. This suggests that individuals scoring high on emotional factors might attend more to invalidation than to validation, and report more invalidation than do non-emotional individuals. In the modal model of emotion, this would include a bias in the attention domain that likely also influences how the individual evaluates and interprets the situation.

Although the relationship between emotions and validation/invalidation can easily be understood based on what was just mentioned, one finding of study II is difficult to explain. In the post hoc analyses, Group 2 scored lower than group 1 in 12 of the 14 comparisons, and lower than Group 3 in 13 of the 14 comparisons. Perhaps most striking are the median differences in anxiety sensitivity, pain catastrophizing, and negative affect. If invalidation and negative emotions are highly related, then it is difficult to explain why Group 2 was found in the heightened-invalidation cluster before treatment. Why did they experience invalidation from their physicians before treatment when they did not rate negative emotionality as high? This suggests that perhaps these individuals (who shifted from the heightened-invalidation cluster to the moderate-validation cluster) experience invalidation from their physicians for other reasons than do individuals in the other two groups. It is possible that the physicians who met with these individuals were actually more invalidating during the pre-treatment meeting than after treatment. Another possibility is that their validation and invalidation remained constant, but that the patients for some reason other than negative emotions perceived them as more invalidating before treatment. Based on current research, there is no clear answer. Nonetheless, factors other than simply negative emotions (e.g., past validation/invalidation history) likely play a role.

Results of study III support the need to address emotion regulation in treatment-resistant anxiety disorders, and suggest that strategies from DBT could be helpful in doing this. In support of this, all included patients reported severe problems with emotion regulation, and in the patient who displayed the most improvements, difficulties with emotion regulation were successfully reduced to the level of healthy individuals. In addition, the DBT model of emotion regulation is highly applicable to treatment-resistant anxiety disorders as well. Borderline patients and anxiety patients share many similarities, although some of the dysfunctional emotion-regulation strategies they engage in might sometimes differ. In many cases, the functions of different behaviors are the same (i.e., to escape emotional...
suffering), but the specific behaviors differ. For example, anxiety patients seldom use self-harm to regulate emotions. Of course, the usefulness of the DBT model in an anxiety context was not explicitly tested in study III, but looking at anxiety disorders and their dysfunctional emotion-regulation strategies might be highly applicable here as well.

**Clinical implications**

Taken together, the results of this dissertation suggest that emotion-regulation benefits can be gained through implementing emotion-regulation strategies from DBT when working with chronic pain patients and patients suffering from treatment-resistant anxiety disorders. As a clinician, these possible benefits are important to be aware of when planning treatments for these patients. However, it is also important to be aware of the associated difficulties and limitations of this treatment approach, which will be further discussed below.

Besides speaking in favor of validation from partners as a way to regulate negative emotions in people with chronic pain, study I provided information about validation and invalidation in the chronic pain couple context. More specifically, the results indicated that there were low levels of both validation and invalidation in these interactions. Of course, the sample studied was rather small, but these results, in combination with previous research finding that relational problems are common in couples in which chronic pain is present (Cano et al., 2005; Flor, Turk, & Scholz, 1987), support implementing interventions aimed at improving relationship functioning in these couples. The good news is that partners of people with chronic pain can be taught to validate more and invalidate less in just 45 minutes. Of course, this study does not say anything about how lasting these effects are, and logically the intervention needs to be more extensive if the goal is to increase validation in these couples over a longer period. However, this finding indicates that, as a clinician, it is important to evaluate the social network around a pain patient and investigate whether the partner needs to be included. Our study also suggests that an intervention aimed at increasing validation and decreasing invalidation in these couples might not have to be overly extensive.

In relation to functional emotion regulation and validation, one thing is especially important for clinicians to keep in mind when meeting pain couples for validation training. The introduction presented the importance of validating the valid and invalidating the invalid, and the importance of this cannot be stressed enough. It is critical to ensure that the partner
validates the valid and invalidates the invalid so as not just to train partners to be more solicitous. Solicitousness from the partner has been of interest in the chronic pain couple literature for many years, and examples of spousal solicitous behavior include expressions of concern, support, and giving assistance in relation to expressions of pain (Romano et al., 1992). Solicitous responses from the partner are positively related to pain, pain behaviors, and disability in patients (e.g., Flor, Kerns, & Turk, 1987; Leonard, Cano, & Johansen, 2006; Romano et al., 1995). Spousal support mainly in the form of attention, expressed concern, and assistance should therefore be avoided. Because of this, it is unsurprising that spouses and family members involved in pain treatments have been taught to respond positively to “well behaviors” (e.g., increased patient activity) and not to respond in solicitous ways to pain behaviors (Cinciripini & Floreen, 1982; Roberts, 1986). However, this approach may have negative consequences if it means that the patients experience less social support from their partners. Getting support is important, because perceived support is associated with lower pain intensity and lower levels of depressed mood (López-Martínez, Esteve-Zarazaga, & Ramírez-Maestre, 2008). Research also demonstrates that those pain patients who report high levels of social support experience less distress and better adjustment to pain (Jensen et al., 2002; Waltz, Kriegel, & Bosch, 1998). Overall, these findings suggest that partners need to be supportive, but not in a way that reinforces pain and dysfunction. If validation of the valid and invalidation of the invalid is not emphasized and practiced during the training, there is a risk that pain and pain behaviors will be reinforced: emotions are likely to be regulated in the moment, but dysfunction is likely to increase in the long run. The recommendation is to teach partners to engage in a lot of validation of the valid in order to offset the possible negative consequences for emotion regulation of invalidation of the invalid. As a clinician, this is of course also very important to keep in mind when communicating with pain patients in a clinical context.

Study II demonstrated that for a smaller and more emotionally distressed group of patients, it might be beneficial to focus more on validation and on more explicitly communicating acceptance. Most patients included in the study experienced high levels of validation and low levels of invalidation, which is positive since it suggests that most patients already feel validated and understood by their physicians. For the smaller group scoring higher on negative affectivity and pain interference, however, more needs to be done. As a clinician, it might be enough to keep in mind that validation is particularly important when meeting these emotional patients, to increase
the frequency of validating responses, and to be clearer in general when communicating understanding. It might also be important to be especially careful with invalidating statements and, instead of simply increasing validation, to make sure to minimize invalidation. Results of this dissertation do not say anything about which is most important, but other research suggests that it might be more important to minimize invalidation rather than only increasing validation (Greville-Harris & Dieppe, 2015; Greville-Harris et al., 2016).

The answer as to why the more emotional patients also experienced more invalidation and less validation from their physicians is likely found in the transactional model (Fruzzetti & Worrall, 2010). In this model, heightened emotional arousal is the starting point for inaccurate expression, misunderstanding, and invalidation. Of course, the design of study II does not specifically address whether heightened emotional arousal or invalidation comes first, but for clinicians this does not necessarily affect how to deal with the problem. Although not the starting point of the model, increasing validating communication will likely decrease negative emotional arousal in these patients, which will in turn increase accurate expression. Of course, the same is true when working with unhealthy interactions in pain couples.

Based on the transactional model, we also concluded that it is likely that the pain patients in the heightened-invalidation cluster experience invalidation not only from their physicians but also from other people in their surroundings, for example, other health care professionals or family members. In light of this, the results of study I are very relevant to clinicians, mainly because there are benefits not only from increasing and decreasing clinician validation and invalidation, respectively, but also because treatment might benefit from simultaneously training family members.

The main clinical implications of study III concern a recommended focus on emotion regulation in the treatment of patients suffering from treatment-resistant anxiety disorders. All patients available after screening for previous treatment failures reported high levels of emotion-regulation difficulties, apparent in their ratings on the Difficulties in Emotion Regulation Scale. To make the treatment effective for a larger proportion of patients, clinicians need to modify their approach. Based on the present results, it is difficult to say exactly what needs to be done, but several possible changes are suggested, for example: increasing the time spent on exposure until generalization to more domains of the patients’ lives occurs,
focusing more explicitly on comorbid problems, and spending more time on motivation and commitment to treatment.

Finally, the possibilities for helping patients in clinical settings regulate their emotions in effective ways go beyond the strategies investigated here. Many strategies are available that can be used at different points in the emotion-generation process. For example, Marsha Linehan’s DBT Skills Training Manual (2nd edition), which came out in 2015, contains no fewer 30 different skills. Many of these can in turn be divided into other, more specific skills, each with a direct or indirect goal of regulating emotions. Although not investigated here, the potential of these skills to regulate emotions in these patients should also be considered.

**Directions for future research**

The studies in this dissertation raise a number of questions for future research. First, it is known that communication is crucial in the chronic pain context. However, many of the mechanisms underlying effective communication, such as validation, are not known. For example, little is known about individual factors (in both the person communicating and the person receiving the communication) that may affect validation and invalidation in communication. Interesting questions include: What characteristics or conditions determine whether a person tends to validate or invalidate other people? What characteristics or conditions determine how a person experiences validation and/or invalidation? Previous research has demonstrated that early validating experiences and difficulties with emotion regulation might play a role (Greville-Harris, 2013). The same study also concluded that feedback that was not in line with the participant’s own views was more likely to be perceived as invalidating or less validating. These are interesting findings, but a lot more work is needed to obtain a full picture.

More information is also needed about which is more important, increasing validation or minimizing invalidation. It has been suggested that the negative consequences of “bad” happenings have a stronger impact on us than do the positive consequences of “good” happenings (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001). In line with this, research finds that it may be more beneficial to reduce invalidating responses than simply to increase validating ones (Greville-Harris & Dieppe, 2015; Greville-Harris et al., 2016). This dissertation does not explicitly address this, but when analyzing the data from study II, correlation analyses were conducted. These analyses indicated that perceived invalidation, but not validation,
correlated positively with all measures of negative affectivity except anxiety. This supports the possibility that more benefits can be achieved by simply decreasing invalidation communication with pain patients than by just increasing validation.

Validation and invalidation also need to be investigated in more detail throughout multimodal pain rehabilitation, and not just immediately before and immediately after treatment. Maybe validation from certain professions is more important than validation from others? Or maybe the number of visits or amount of time spent together in treatment is what matters? Also, very few studies have investigated actual behaviors in interactions between patients and health care professionals. Future research should look at the actual content of patient–health care professional interactions and how the health care professionals react to emotionally distressed patients. This would provide important information about actual validation and invalidation in these interactions, as well as enable us to understand whether health care professionals change their response style depending on whether the patients express emotional distress in conversations. Research should also investigate the relationship between those interaction patterns, emotions, and treatment effectiveness.

In relation to validation in the chronic pain couple context, future studies must replicate the findings of study I in a clinical setting. Research should also investigate the effects of more extensive validation training in which not just one partner receives training. The training should not just be investigated in relation to emotions, but other factors such as pain, pain interference, and marital satisfaction should be added to the analyses. In addition, long-term effects should be investigated as well.

Related to study III, more research is needed into what factors are involved when standard CBT treatment does not work. This knowledge is needed in order to develop the best possible treatment for these patients. Future research should continue to evaluate DBT for treatment-resistant anxiety disorders, but modifications to the treatment (e.g., those recommended here) should be made first to enhance treatment results. As a first step, it is recommended that the modified treatments be evaluated using single-case designs, in which many details about the individual patients can be collected. However, in the end, the effectiveness should be evaluated in randomized controlled trials in which different treatment alternatives are compared both with each other and with a control condition.
Methodological limitations and strengths

This dissertation has certain methodological limitations and strengths that are worth mentioning: first, more general advantages and disadvantages related to the specific research methods are highlighted; then, more specific limitations and strengths in the three studies are discussed.

Study I used a within-group design with pre- and post-intervention measures; specifically, this means that all participants were exposed to the same condition (in this case, validation training). In this design, the subjects are their own controls and error arising from natural variance between individuals is reduced. Another advantage, compared with between-subject designs, is that the design requires fewer participants, making the process less time consuming and therefore often less expensive. One disadvantage of this research design is the problem of carryover effects (i.e., the prior assessment influencing the next assessment) affecting internal validity. Also, the lack of a control group decreases the internal validity.

Study II used a prospective, longitudinal design in which a clinical chronic pain population was followed over time. In this design, data are collected at two or more time points and are analyzed using quantitative statistical methods. A strength is that variables are measured at more than one time point, making it possible to draw conclusions about the time line between events (e.g., perceived validation and pain outcomes). Of course, that an antecedent condition occurred before an outcome does not necessarily indicate causality, though it constitutes a prerequisite for such a conclusion (Kazdin, 2003). Limitations of this kind of research design include that it provides limited information about what happens between measurement points and that attrition or loss of subjects over time can bias the sample. If the people included in the study are followed for the same period and assessed at the same time points, cohort effects may serve as moderators (e.g., change of seasons or events affecting society as a whole), affecting the internal validity of the study (Kazdin, 2003).

Study III used a single-case experimental design. This design includes systematic observation of individuals, manipulation of variables, repeated measurement, and data analysis (Tate et al., 2008). In a single-case design, all individuals serve as their own controls and the dependent variables are measured continuously and repeatedly during a baseline phase before treatment, during treatment, and sometimes also after treatment (in this case, at the six-month follow up). To draw conclusions about change, data collected during and after treatment are compared with data collected during the baseline phase (Morgan & Morgan, 2008). Data are usually
presented visually in graphs, and visual inspection is the most common way to conduct analyses. However, it is recommended that results should be analyzed both visually and statistically (Tate et al., 2008). The main advantage of a single-case design is that it gives detailed information about the dependent variables over time, i.e., before, during, and sometimes also after treatment. Another advantage related to this is that following individuals closely over time provides qualitative data that can help explain the results, information that would be lost in group designs when only mean values from before and after treatment are compared. By measuring variables continuously and repeatedly, some threats to internal validity are controlled for (e.g., regression to the mean and the effect of retesting). Another strength concerns the ability to draw conclusions about causal relationships. If change occurs after treatment started, it can likely be causally attributed to the treatment. A single-case design also makes it possible to pilot test new treatments and draw conclusions about whether they are worthy of further investigation, without necessarily using too many resources. In terms of the limitations of a single-case design, the most obvious one concerns generalizability. This issue is usually dealt with by replicating the results in more patients to increase both external and internal validity, but this is still often not enough to comfortably say that the results apply to the general population.

Before moving on and discussing more specific limitations, a methodological strength of study II is worth mentioning. This study incorporated a person-oriented approach, which gives an interesting perspective because it highlights individual perceptions. Another alternative would have been to use a variable-oriented approach focusing on the unique variance explained by each of the variables of interest at a group level. Using a person-oriented approach made it possible to highlight relationships between perceptions of validation and invalidation, pain, functioning, and emotional factors at the individual level as well as variations in the relationships between subgroups. For this particular study, it was a strength to use a person-oriented approach, because the sample as a whole scored high on perceived validation and low on perceived invalidation. Without this approach, it would have been easy to say that experiencing invalidation was not an issue in this sample, when in fact there were individuals who perceived the opposite. As well, using a person-oriented approach made it possible to compare patients with different perceptions to each other.

Regarding limitations, one concern is related to external validity and the recruitment of participants in the studies. In short, participation was
optional and the samples were self-selected. Some participants in study I were recruited through advertisements and others were recruited through telephone calls because they had specified that they were interested in participating in research into pain. How representative this sample is of the pain patient population as a whole is difficult to say. The sample in study I was also relatively small \( n = 20 \). Overall, these issues may affect external validity, specifically, the generalizability of the results. Patients in study II were all patients seeking care at a pain rehabilitation clinic. Although all patients were encouraged to participate by filling out self-report questionnaires, there was indeed a group of patients who chose not to do this, at either one or more than one time point. To determine whether our sample was biased, the included patients were compared with the other patients at the clinic who had filled out questionnaires. Pre-treatment scores for all measures used in the study were included in the comparison, and pain severity was the only measure for which a significant difference was found, i.e., the included patients scored higher than did the excluded ones, though this difference should be considered small. This finding increases the external validity, because these results were more likely also applicable to other pain patients found in specialized care. However, there is a risk of systematic differences between the patients who did not choose to participate in the research at all and those who chose to participate at one or more time points. Patients in study III were recruited within a psychiatric outpatient clinic. When patients fitted the inclusion criteria, they were informed of the study and invited to participate. There are no data on individuals who were considered for the study but were not invited because they did not meet the inclusion criteria. In addition, the included patients constitute a small sample. Whether this influenced the results is difficult to say, but sampling bias may also have influenced the external validity and thus the generalizability of the results of study III.

Other notable limitations concern how the data were collected, which was done in several different ways. An objective observational scale was used to rate validation and invalidation in couples’ interactions in study I, and structured clinical interviews were used to diagnose patients in study III. In addition, self-report measures were used in all three studies. Self-report measures are a very common way of measuring subjective experience in clinical psychology research (Kazdin, 2003), and the measures require participants to report aspects of their own personal experience. Unfortunately, there are limitations to all data collection methods used. When using self-report measures, for example, there is a risk that bias and
distortion may influence responses. There is also a risk that responses may be influenced by item wording and format. To minimize risk of bias, only established questionnaires and methods evaluated in terms of validity and reliability were used. It is also worth mentioning that many of the concepts studied (e.g., perceived validation and negative affect) are by definition subjective and difficult to measure objectively; moreover, the subjective experience is in fact what was to be measured.

When using an objective observational scale, the reliability and validity of the scale are also threatened if it is not used correctly, for example, if inter-rater reliability is low or if coders inaccurately code validation and invalidation (which would affect the scale’s validity). Both these scenarios would make it difficult to generalize the results to other contexts outside this particular setting. Several precautions were taken to prevent this from happening. First, an experienced coder with considerable knowledge of validation and invalidation in couple interactions rated the conversations between pain couples. Potential coders underwent training in validation and invalidation and in how to use the observational coding scale. They then rated the same conversations as rated by the experienced coder, and only those coders whose results were consistent with his responses were chosen to rate the actual interactions in the study. After all the couple interactions were coded, the results were again compared with those of the experienced coder; particular coders’ scores were only used if they were still consistent with those of the experienced coder.

The only measure included in these three studies that did not meet the criteria of having well-established psychometric properties was the semi-structured clinical interview (SCID-IV-I; First et al., 1997) used in study III. Specifically, it has been difficult to establish good inter-rater reliability for SCID-IV-I. Since this interview was used to measure diagnostic status, and also any change in diagnostic status from before to after treatment, this is problematic. However, measures were taken to ensure that the same experienced psychologist conducted the interview both before and after treatment for each patient. The hope was that this safety precaution would make it easier to draw conclusions about possible changes, since individual factors in the raters were kept constant.

**Summary and concluding remarks**

In summary, this dissertation has endeavored to expand our knowledge of how to use emotion regulation strategies from DBT to regulate emotions in patients in clinical settings. In doing so, the present research had two parts.
The first part, comprising two studies, investigated validation in chronic pain in both a couple context and a clinical context, and the results of these investigations established the foundation for an in-depth discussion of the concept of validation. The second part, comprising one study, investigated the feasibility and effects of a whole treatment package intended to decrease problems with emotion regulation and anxiety in patients suffering from treatment-resistant anxiety disorders. These three studies investigated well-known strategies for emotion regulation in contexts in which functional emotion regulation was required. Overall, these studies confirm the validity of this requirement and demonstrate that emotion-regulation strategies from DBT can be effective in regulating emotions in these patients. These studies also illustrate some of the difficulties in doing this, and provide important information for future work, for example, suggestions for modifications of the treatment approach that might increase positive outcomes.

Conclusions

- The results of this dissertation support the need for validation training in couples in which chronic pain is present, and demonstrate that rather brief validation training is enough to increase validating and decrease invalidating responses in partners of people with chronic pain.
- Increased validation and decreased invalidation from the partner is associated with decreased negative affect in the person with pain. This supports the use of validation from the partner as a way to down-regulate negative affect in people with chronic pain, possibly without reinforcing pain.
- Pain patients in a specialized pain rehabilitation clinic differ in terms of how much validation and invalidation they perceive from their clinic physicians. It is possible to identify subgroups of patients with different patterns of perceived validation and invalidation. Most pain patients experience high levels of validation and low levels of invalidation from their rehabilitation physicians. However, a smaller group of patients perceives heightened levels of invalidation in combination with low levels of validation.
- Although it would seem intuitive for perceptions of validation and invalidation from a physician to be the same both before and after treatment, for some patients they change. These changes in
perceptions seem to be related to negative affectivity and level of pain interference in the patients.

- The patients who perceive heightened invalidation and low validation from their physicians report significantly higher levels of negative affectivity and pain interference than do the other patients after treatment.

- There is no relationship between perceived validation and invalidation from the physician (before or after treatment) and change in outcome variables. This indicates that, regarding treatment outcome, it does not matter whether the physician who sees the patient immediately before and immediately after treatment is validating or invalidating.

- Future research should investigate the more specific mechanisms underlying effective communication and validation in a chronic pain context, considering, for example, which is most important, increasing validation or decreasing invalidation in interactions with pain patients. Research should also investigate validation and invalidation in more detail throughout multimodal pain rehabilitation, and not just immediately before and after treatment.

- DBT for patients suffering from treatment-resistant anxiety disorders is an acceptable treatment alternative in terms of feasibility. In terms of effectiveness, results are mixed but indicate that it is effective in reducing problems with emotion regulation. Modifications of the treatment are needed to make the treatment effective for a larger proportion of patients. Future research should investigate the feasibility and effectiveness of such modifications.
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