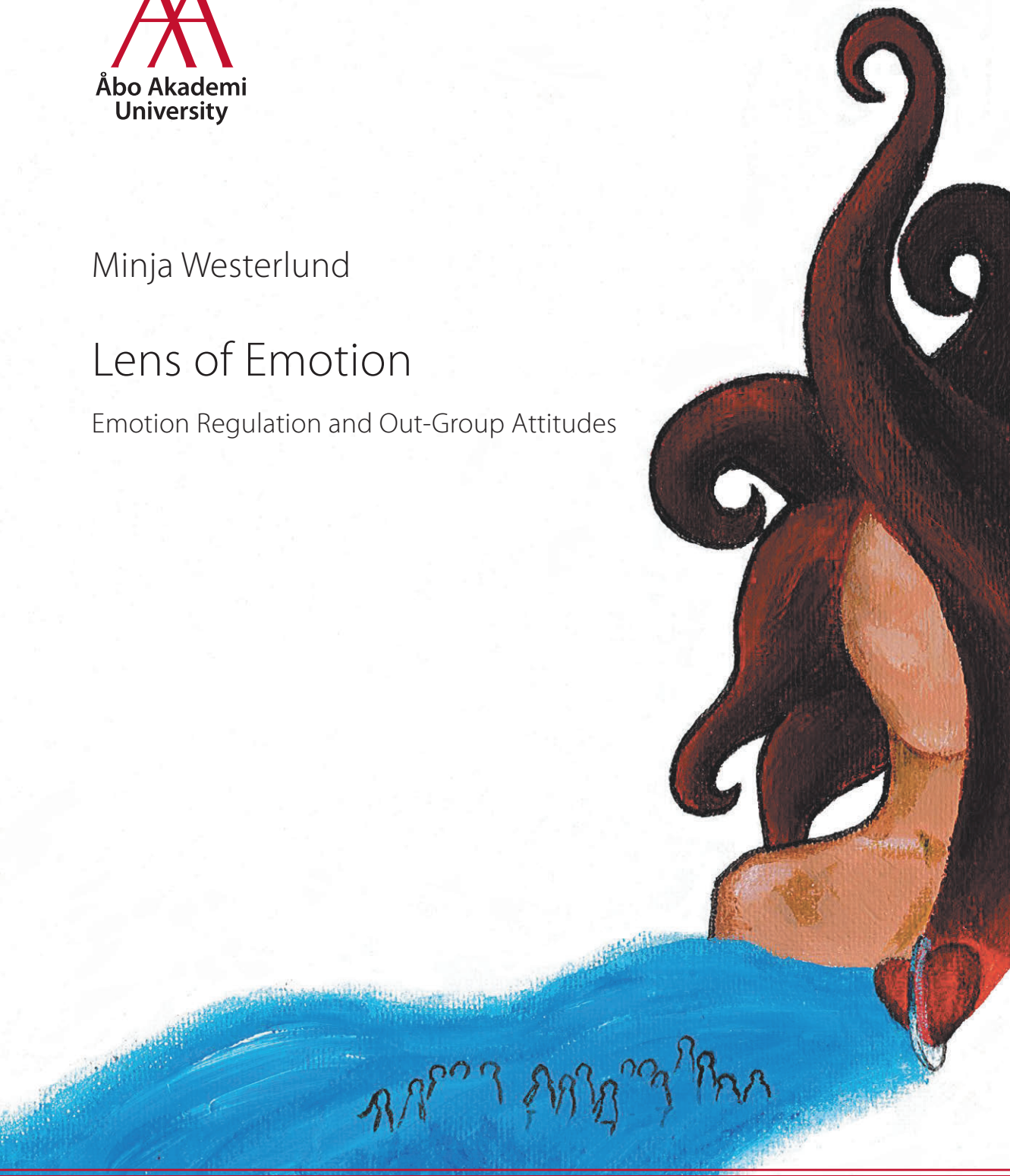
Åbo Akademi University

Minja Westerlund

Lens of Emotion

Emotion Regulation and Out-Group Attitudes



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Studies and exams

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Lens of Emotion

Emotion Regulation and Out-Group Attitudes

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Åbo, Finland, 2020

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To my parents.

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Lima at sunset, late 2019

Minja Westerlund

List of original publications

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II Westerlund, M., Antfolk, J. & Santtila, P. (2019). Negative views of out-groups and emotion regulation strategies: Evidence for an association with the tendency to suppress emotion expression, but not with cognitive reappraisal or emotion dysregulation. *Current Psychology*. Advance online publication. doi:10.1007/s12144-019-00430-7

III Westerlund, M., Santtila, P. & Antfolk, J. (2019). Regulating emotions under exposure to negative out-group-related news material results in increased acceptance of out-groups. *Journal of Social Psychology*. Advance online publication. doi:10.1080/00224545.2019.1675575

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Abstract

Emotions play an important role in intergroup attitudes, and more broadly, in intergroup relations. Emotions, and intergroup emotions more specifically, arise based on an individual's appraisal of an out-group situation, and the emotion triggers a corresponding action tendency. An especially robust source for negative intergroup emotions and negative intergroup attitudes is perceived intergroup threat. The aim of the present thesis was to assess whether a down-regulation of negative emotions after perceived intergroup threat would result in more positive attitudes toward those out-groups.

In Study I, we assessed two emotion regulation scales; a scale assessing emotion dysregulation and another targeting more normative, habitual forms of emotion regulation. The latter assesses two commonly studied emotion regulation strategies, cognitive reappraisal and expressive suppression. Both scales were found to be psychometrically sound and were used in all our subsequent studies.

In Study II, we investigated the relationship between habitual emotion regulation and out-group attitudes. We found that habitual expressive suppression was associated with decreased acceptance toward out-groups. Cognitive reappraisal was not associated with increased acceptance, in contrast to previous literature.

In Study III, we assessed whether there was a causal link between emotion regulation and out-group attitudes after exposure to threatening stimuli. The stimuli consisted in real news material depicting different kinds of intergroup threats. Participants who received no instructions to regulate their emotions when reading upsetting news articles had significantly higher levels of anger than those who cognitively reappraised their emotions. Similar results were found for disgust when comparing the reappraisal and control group, but the association was not significant. We found that both cognitive reappraisal and expressive suppression increased immediate acceptance of target out-groups, compared to the control condition. It may be that merely attending and focusing on emotional reactions serves as a regulator resulting in less negative intergroup attitudes, compared to a condition where no such instructions are given.

In Study IV, we assessed whether modifying emotional reactions when reminded of a real terror attack would affect attitudes toward out-groups perceived to be associated with the attack. Cognitive reappraisal significantly decreased negative emotions, and mindful attention increased them. We also found that adverse emotions directly negatively predicted the attitudes toward attack-associated groups, but not toward other groups. The reappraisal and mindful attention conditions affected the out-group attitudes via negative emotions. The out-group attitudes were not directly affected by the experimental condition. Additionally, posttraumatic stress symptoms correlated significantly with the degree of negative emotions both before and after the threatening stimuli reminding of the terror attack. The posttraumatic stress symptoms also correlated negatively with the acceptance of attack-associated groups, but not other groups. The results from studies III and IV indicate that the delay between intergroup threat, the emotion regulation intervention and the attitudinal outcome may play a role, as well as the type of threat.

The results of the present studies can be applied both in preventive and clinical measures. For example, they can be of interest together with other interventions for programs aiming at improving intergroup attitudes or preventing negative intergroup attitudes. Such initiatives may be of interest for example for actors working in multicultural settings, in schools and correctional facilities for individuals who have previously engaged in intergroup hostilities.

Sammanfattning på svenska

Emotioner spelar en viktig roll för de attityder som olika grupper har av varandra. Emotioner, och emotioner mellan grupper mer specifikt, uppstår ur en individs bedömning av en situation som involverar en utgrupp, och emotionen triggar en motsvarande aktionstendens. En särskilt viktig källa för negativa känslor och attityder mellan grupper är då utgruppen upplevs utgöra ett hot. Avsikten med föreliggande avhandling var att studera ifall nedreglering av negativa känslor efter sådana hot skulle resultera i mera positiva attityder mot vederbörande utgrupper.

I Studie I undersöktes två känsloregleringsskalor; en skala som mäter emotionell dysreglering och en som kartlägger mera normativ, habituell känsloreglering. Den senare mäter två allmänt studerade känsloregleringsstrategier, kognitiv omprövning och expressivt undertryckande. Båda skalorna visade sig vara psykometriskt adekvata och användes i alla efterföljande studier.

I Studie II studerade vi sambandet mellan habituell känsloreglering och attityder mot utgrupper. Vi fann att habituellt expressivt undertryckande hade samband med mindre positiva attityder mot utgrupper. Kognitiv omprövning var inte associerat med attityder mot utgrupper, i kontrast till tidigare litteratur.

I Studie III undersökte vi ifall det fanns ett kausalt samband mellan känsloreglering och attityder mot utgrupper efter exponering för hotfulla stimuli. Stimulusmaterialet bestod av riktigt nyhetsmaterial som beskrev olika hot som involverade utgrupper. De försökspersoner som inte fick några instruktioner om att reglera sina känslor då de läste upprörande nyhetsartiklar hade signifikant högre nivå av ilska än de som kognitivt omprövade sina känslor. Man fann liknande resultat för avsky mellan kognitiv omprövning- och kontrollgruppen, men sambandet var inte signifikant. Vi fann att både kognitiv omprövning och expressivt undertryckande ökade de positiva attityderna mot de relevanta utgrupperna, jämfört med kontrollgruppen. Det kan vara att enbart genom att uppmärksamma och fokusera på de emotionella reaktionerna uppstår det en känsloreglering, vilket resulterar i mindre negativa attityder mot utgrupper, jämfört med en betingelse då sådana instruktioner inte ges.

I Studie IV undersökte vi ifall modifikation av de emotionella reaktionerna då man blir påmind om en riktig terrorattack skulle påverka attityderna mot utgrupper som associeras med attacken. Kognitiv omprövning minskade signifikant de negativa emotionerna, och medveten uppmärksamhet ökade dem. Vi fann också att obehagliga känslor direkt negativt predicerade attityder mot grupper som associerats med attacken, men inte gentemot andra grupper. Kognitiv omprövning och medveten uppmärksamhet påverkade attityderna mot utgrupper via negativa emotioner. Attityderna mot utgrupper påverkades inte direkt av den experimentella betingelsen. Vidare, posttraumatiska stressymptom korrelerade signifikant med mängden negativa emotioner både före och efter de hotfulla stimuli som påminde om terrorattacken. De posttraumatiska stressymptomen korrelerade också negativt med attityderna mot grupper som associerades med attacken, men inte med attityderna mot andra grupper. Resultaten från Studierna III och IV tydde på att tiden mellan hotet, känsloregleringsinterventionen och de attitydmässiga utfallen kan spela en roll, liksom typen av hot.

Resultaten från de föreliggande studierna kan användas både i preventiva och kliniska åtgärder. Till exempel kan de vara av intresse tillsammans med andra interventioner inom program vars syfte är att förbättra relationer mellan grupper eller att förhindra negativa attityder mellan grupper från att uppstå. Dylika initiativ kan vara av intresse t.ex för aktörer i multikulturella kontext, i skolor och kriminalvårdsanstalter för individer som tidigare har varit involverade i aggressioner mot utgrupper.

1. Introduction

"This is the spoils of war from the female pigs of the P.K.K [Kurdistan Worker's Party]."

A gruesome video from Afrin, Syria, depicts the partly unclothed, mutilated corpse of Barin Kobani, fighter of the Kurdish women's militia. The words are uttered by what appears to be a fighter from the Syrian rebel militia that took part in the Turkish offensive against the Kurdish forces in 2018 (Nordland, 2018).

To strip out-groups of human qualities by comparing them to animals (Hirschfeld Davis, 2018), such as pigs (Nordland, 2018), cockroaches (BBC, 2016) or a cancer of the society (Haaretz, 2012) is a form of dehumanization that is often used in xenophobic propaganda (Musolff, 2015). It is also an essential component in facilitating intergroup atrocities (Bandura, 1999), as described in a large body of literature that addresses the cognitive components of intergroup hostility (e.g. Billig, 2002; Kteily & Bruneau, 2017; Levy, 1999; Louis, Esses, & Lalonde, 2013).

Not only cognitive factors, but also the emotions that underlie xenophobic rhetoric and actions are an aspect of intergroup hostility. Despite having occasionally been considered even irrelevant (Lazarus, 1993), emotions have been shown to play a central role in guiding human cognition and behavior. One can easily picture the intensity of emotions that are reflected in the scenario that introduces this chapter.

When encountering an out-group, individuals first assess its significance to their own wellbeing (Frijda, 1988; Moors, Ellsworth, Scherer, & Frijda, 2013; Tooby & Cosmides, 2008). This appraisal then triggers a corresponding emotion (Frijda, 1988; Tooby & Cosmides, 2008) and the emotion, in turn, may trigger certain behaviors toward the out-group (Mackie, Devos, & Smith, 2000). For instance, the appraisal of out-groups as pests and disease-related may trigger disgust. As disgust promotes avoidance, it discourages further contact (Hodson, Kteily & Hoffarth, 2014). From an evolutionary perspective, it has been suggested that each emotion has evolved to handle specific, recurring situations that affect survival and reproduction. Nevertheless, the social context has changed considerably compared to the ecological contexts in which they have been shaped by natural selection. Consequently, our emotions might

be maladaptive in our current settings (Gross, 1999). It is, for example, not desirable that an emotional reaction prompts an aggressive response toward an out-group member in a context where violence is not morally justifiable. Instead, a more appropriate solution would be to decrease the intensity of the negative emotion for the urge to aggress to pass. This highlights the importance of emotion regulation (Gross, 2002).

In fact, emotions play a crucial role in intergroup attitudes and conflict even after controlling for other well-known predictors of intergroup hostility (Halperin & Tagar, 2017). This raises the question of whether aversive emotions toward an out-group could be down-regulated to facilitate a more positive approach to the out-group. This field of research is timely, given the growing polarizations between certain societal groups in Europe and elsewhere, which is manifested, for example, as increased prejudice and anti-immigrant sentiments (Gorodzeisky & Semyonov, 2016; Kuntz, Davidov, & Semyonov, 2017). Emotion regulation can constitute a potential component in interventions that promote positive intergroup relations in different stages of intergroup conflict (Halperin & Tagar, 2017). The early phases of intergroup hostility—the main focus of the present thesis—are generally characterized by increased stereotyping, stigmatization and dehumanization of the out-group (Woolf, Woolf, Hulsizer & Hulsizer, 2003). Under certain conditions, however, such processes may be followed by discrimination, violence and, in extreme cases, armed conflict and killings. Providing tools for preventing intergroup hostility motivated the research for the present thesis.

1.1. The Process Model of Emotion Regulation

Ways to regulate and control emotions and their behavioral consequences have for long generated interest among researchers and clinicians. Some of the earlier contributions to this field lie within psychoanalytic theorizing. In Freud's structural model of personality, ego defenses have a central role in regulating anxiety (Freud, 1997). Another important antecedent to the field of emotion regulation is research into stress and coping (Gross, 1999), which originated with Cannon (1914) and Selye (1975). Another early contribution to the study of self-regulation was the literature on the role of cognitive appraisals on self-control and delay of gratification (Mischel, 1974). Since the late 1990's, the field of emotion regulation has attracted increasing interest and the number of published

research articles has multiplied exponentially (Gross, 2015a). A broad search with the term *emotion regulation* today (April 10, 2019) results in more than 6700 results on PubMed (1984-2019) and more than 11.000 on PsycINFO (1806-2019).

According to Gross (2015a), emotion regulation falls under the umbrella term affect regulation, which additionally comprises coping and mood regulation. Although there is considerable overlap between these regulatory processes, some distinctions can be made. Compared to emotion regulation, coping is mainly focused on long-term alleviation of stress responses, whereas mood regulation targets more sustained subjective feeling states that induce less specific behavioral responses (Gross, 2015a).

Perhaps the most well-known model of emotion regulation is the Process Model of Emotion Regulation by Gross (1998), which builds on the modal model of emotion that describes emotion generation as a temporal, appraisal-based process involving experiential, behavioral and physiological responses (Gross & Thompson, 2007). The model divides emotion regulation into two main categories, antecedent-focused and response-focused emotion regulation. The former relates to regulatory efforts taking place before the emotional response is fully generated, and the latter focuses on regulation once the emotion has wholly emerged. The model further distinguishes five different forms of emotion regulation along a temporal continuum. The first four strategies are defined as antecedent-focused strategies and the last one as response focused: situation selection, situation modification, attentional deployment, cognitive change and response modulation. *Situation selection* refers to attending or avoiding certain places, people or situations based on their estimated emotional impact. For example, an individual may choose to avoid the company of a group of individuals that tends to leave the individual feeling irritated. Once a situation has been selected, the individual may engage in *situation modification*. That implies changing certain aspects of the situation to modify its emotional impact. For example, during a heated group discussion an individual may ask to change the topic of discussion into something more pleasurable. The next available emotion regulation strategy is *attentional deployment*, which implies directing one's attention to certain aspects of the situation based on their effect on experienced emotions. For example, during an upsetting group discussion, the individual may choose to focus on social media

applications rather than the discussion. The fourth emotion regulation strategy is called *cognitive change*. Here, the individuals change the meaning they attach to the situation to modify its emotional consequences. An example of cognitive change is to reduce the level of anger toward an out-group by thinking of their comments during the discussion as reflecting curiosity rather than malevolence. The fifth emotion regulation strategy, *response modulation*, belongs to response-focused strategies. It involves modifying the behavioral, physical or experiential responses to the situation. Examples of response modulation are shouting at another person in anger, numbing anxiety using alcohol or hiding one's sadness after negative feedback (Gross, 1998).

The Process Model of Emotion Regulation has faced some criticism for placing limited attention on findings indicating that the order of the emotion responses is not fixed (Koole, 2009). Recently, Gross (2015b) further developed his model in the more dynamic Extended Process Model of Emotion Regulation. The extended model sees emotion regulation as a system of interacting valuations and introduces three stages for emotion regulation: identification of need for regulation, selection of regulation strategy, and implementation of regulatory efforts. In a notion by Koole and Veenstra (2015), a limitation concerning both the Process Model of Emotion Regulation and its extended version is that the models fail to consider the emotion regulatory dynamics that emerge from people's social interactions—a notion Gross (2015b) called into question, highlighting the extended model's emphasis on context (like social factors).

Another development of the Process Model of Emotion Regulation was recently introduced by Goldenberg, Halperin, van Zomeren, and Gross (2016). The authors presented a model combining the Intergroup Emotions Theory (Smith & Mackie, 2008; see section 1.5 below) and the Process Model of Emotion Regulation into The Process Model of Group-Based Emotions. Intergroup emotions refer to emotions that individuals experience based on their membership in a specific group and by reacting to situations that are relevant to the group in question. The Process Model of Group-Based Emotions is based on the premise that intergroup emotions can be regulated in a similar manner and by using basically the same strategies as when regulating non-group-based emotions (Goldenberg et al., 2016).

1.1.1. Cognitive Reappraisal and Expressive Suppression

Two emotion regulation strategies derived from the Process Model of Emotion Regulation have been studied extensively, namely cognitive reappraisal, which belongs to the category of cognitive change, and expressive suppression, which is a response-focused strategy.

As described by the appraisal theories of emotion (e.g. Frijda, 1988; Moors et al., 2013), emotions arise as a result of the individuals' interpretation of a certain, evolutionarily relevant situation. The emotion regulation strategy of cognitive reappraisal implies to cognitively change the meaning of a situation in order to alter its emotional impact. An example of this strategy is to take a distanced perspective to a situation and interpret it in an unemotional way (Shiota & Levenson, 2012). For the regulation of intergroup emotions, Goldenberg et al. (2016) compare cognitive reappraisal to the strategy of social creativity (as defined by social identity theory) in which an individual modifies the interpretations of a situation in a manner that preserves positive emotions toward the in-group.

The Process Model of Emotion Regulation posits that the different emotion regulation strategies have different short- and long-term consequences on the individual's feelings, cognitions and actions (Gross, 2015b). Numerous studies have found that cognitive reappraisal promotes psychological wellbeing (Chin & Rickard, 2014; Haga, Kraft, & Corby, 2009; Mcrae, Jacobs, Ray, John, & Gross, 2012; Schutte, Manes, & Malouff, 2009), is associated with positive emotions (Gross & John, 2003) and even with physical health (Memedovic, Grisham, Denson, & Moulds, 2010; Reva et al., 2013). However, the positive consequences of cognitive reappraisal, as with other emotion regulation strategies, depend on the context (McRae, Heller, John, & Gross, 2011; Ford & Troy, 2019) and the cultural environment (Matsumoto et al., 2008; Soto, Perez, Kim, Lee, & Minnick, 2011). An additional important aspect to consider is that earlier studies have found gender differences in the use of specific emotion regulation strategies. A common finding is that there are small or no differences in the use of cognitive reappraisal (e.g., Gross & John, 2003; Rogier, Garofalo, & Velotti, 2017).

The other well-researched emotion regulation strategy relevant for the present thesis is expressive suppression. It relates to inhibiting the expression of an emotion once it has arisen (Gross & Thompson, 2007), for

example, by hiding socially undesirable emotions from the environment. The analysis of how suppression of emotion expression affects the individual dates back to the beginning of the century. In his hydraulic model of emotion, Freud, building on the physical law of the conservation of energy, proposed that emotional energy created by conflicts of threatening events needed to be processed or expressed, otherwise it would remain locked in the body and cause psychological problems (Freud, 1997; Littrell, 2008). Although contemporary research does not provide empirical support for the hydraulic model per se, studies have generally found that expressive suppression tends to be associated with negative health outcomes (Burns et al., 2011; Roberts, Levenson, & Gross, 2008; but see also Butler, Lee, & Gross, 2009; Memedovic et al., 2010), poorer adjustment and increased negative emotions (Butler et al., 2003; Chervonsky, Hunt, Chervonsky, & Hunt, 2017; Gross & John, 2003, see also Littrell, 2008, for a discussion). The literature thus seems to indicate that suppressing emotion expression tends to convey negative consequences for the individuals, although, on the other hand, merely expressing negative emotion without reappraising it may also not decrease the negative emotion (Littrell, 2008). More recent literature has further indicated that expressive suppression is associated with psychopathology (Aldao, Nolen-Hoeksema, & Schweizer, 2010). For example, in a study by Boden et al. (2013), it was found that among veterans, the use of expressive suppression was associated with more severe symptoms of posttraumatic stress disorder (PTSD). Cognitive reappraisal, on the other hand, was associated with less severe PTSD. The direction of causality of these co-occurring changes, however, has yet to be investigated (Boden et al., 2013). Lastly, when it comes to gender differences, men tend to use expressive suppression more than women (e.g., Gross & John, 2003; Rogier, Garofalo, & Velotti, 2017).

In sum, since habitual and instructed cognitive reappraisal have been associated with increased positive affect and expressive suppression has been associated with increased negative affect, one could expect that they would exert similar effects on emotions toward threatening out-groups, and as well as on subsequent out-group attitudes.

1.2. Mindful Attention

Over the last decades, the academic and clinical interest in mindfulness has greatly increased (Allen et al., 2006). Mindfulness has its basis in philosophical traditions, largely in Buddhism. The practice involves attending one's inner experiences in the present, in a non-judgmental manner (Kabat-Zinn, 2005). Traditionally, emotion regulation and mindfulness have been studied as separate concepts, but recent attempts on integration have also been made (Chambers, Gullone, & Allen, 2009). Within the Process Model of Emotion Regulation, Sheppes and Gross (2013) categorize mindfulness under attentional deployment, an anterograde strategy. Further, mindfulness practice has been found to result in improved emotion regulation abilities (Robins, Keng, Ekblad, & Brantley, 2012). Reese, Zielinski and Veilleux (2015) studied the relationship between mindfulness, emotion dysregulation and the behavioral inhibition system (BIS; see section 1.4 below). The behavioral inhibition system responds to threats with symptoms like anxious arousal and avoidance. The authors found that BIS sensitivity predicted emotion dysregulation indirectly through under-utilization of mindfulness (Reese et al., 2015). The authors suggest that individuals with difficulties in mindfulness practices face challenges in emotion regulation because they fail to attend to their internal emotional states and engage in self-criticism and strong reactions when experiencing intense emotions (Reese et al., 2015).

Given the previous literature on how mindfulness can increase acceptance of inner emotional states and hence likely limit the effect of aversive emotions and decrease emotional avoidance (Hayes, Luoma, Bond, Masuda, & Lillis, 2006), one could expect that a mindfulness intervention would lead to reduced negative emotions toward out-groups after a threat.

1.3. Emotion Dysregulation

Thus far, the present review has focused on generally functional forms of emotion regulation. Another aspect of emotion regulation is when individuals fail to regulate their emotions. Emotion dysregulation is said to occur when an individual is unable to regulate emotional experiences, expressions and responses in regular settings (Linehan, Bohus & Lynch,

2007). Gratz and Roemer (2004) proposed a conceptualization of emotion dysregulation consisting of non-acceptance of emotional responses, difficulties engaging in goal-directed behavior, impulse control difficulties, lack of emotional awareness, limited access to emotion regulation strategies and lack of emotional clarity. Emotion dysregulation has been linked to psychopathology (Aldao et al., 2010; Bradley et al., 2011; Campbell-Sills & Barlow, 2007), self-harm, violent behavior toward others and aggression (Roberton et al., 2012, for a review). It has also been found to be positively associated with negative affect (Bradley et al., 2011). Further, emotion dysregulation and prejudice are both related to poorer or limited academic performance (Carvacho et al., 2013; Gumora & Arsenio, 2002), associations that are relevant with regards to the current research questions.

When examining the role of emotion dysregulation within an intergroup context, it is plausible that emotion dysregulation prevents the effective downregulation of negative emotions toward different out-groups (after threat), and that the persisting negative emotions would affect the subsequent out-group attitudes negatively.

1.4. Theories of Psychological Threat and Defense

Several social psychological theories have discussed the process of psychological threat and defense (e.g. Fritsche et al., 2013; Fritsche, Jonas, & Kessler, 2011; Pyszczynski, Greenberg, & Solomon, 1999 [but see also Klein et al., 2019]; Tritt, Inzlicht & Harmon-Jones, 2012). Such theories describe the emotional and defensive reactions when individuals are faced with different kinds of threat. Specifically, when individuals face a discrepancy in relation to their current cognitions and motivations, an anxious arousal emerges and motivates the individuals to reduce this aversive arousal with the help of thoughts and behaviors (Jonas et al., 2014). The threats are not necessarily of great explicit magnitude; for example, merely interacting with a member from a devalued out-group can result in cardiovascular threat reactions (Mendes, Blascovich, Lickel, & Hunter, 2002). The type of threat relevant for the present studies is out-group threat, which implies that one group's actions, beliefs or characteristics are perceived to threaten the wellbeing of another group or challenge it from reaching its goals (Riek, Mania, & Gaertner, 2006).

Jonas et al. (2014) combined a number of the proposed social psychological theories of psychological threat and defense into a general model of threat and defense. The authors suggest that this theory can be combined with the existing bio-psychological model of personality, the Reinforcement Sensitivity Theory (RST; Gray, 1982; McNaughton & Corr, 2004), which posits that the anxiety, hypervigilance and arousal that emerge as a response to threat are produced by the behavioral inhibition system (BIS). Jonas et al. (2014) suggest that the BIS underlies what is referred to as *proximal defenses* (for example increased vigilance and efforts to suppress, distract and distance oneself from anxiety provoking thoughts and circumstances). Next, the behavioral approach system (BAS) is activated; a system that Jonas et al. (2014) parallel with *distal defenses*. The BAS involves moving toward an alternative focus or solution that is less threatening.

According to the general model of threat and defense, threat involves an individual experiencing a discrepancy at a perceptual, epistemic or motivational level. The organism alarms the individual about this discrepancy with heightened attention and anxiety. To neutralize this aversive emotion, proximal defenses are activated. These defenses suppress the threatening thoughts from awareness. After a delay, distal defenses emerge with the objective of moving the individual toward an alternative, less threatening focus. The distal defenses are approach-directed and involve commitment to a certain incentive, activity, goal, ideal or group (Jonas et al., 2104). They can for example consist in cultural worldview defense, adhering to the group one identifies with and distancing oneself from an out-group (Greenberg, Solomon & Arndt, 2008; Pyszczynski, Greenberg & Solomon, 1999; Jonas et al., 2014). Several studies show that different kinds of perceived threats are associated with intolerance (Jonas & Fritsche, 2013), aggression (McGregor et al., 1998; McPherson & Joireman, 2009), bias, discrimination and prejudice (Butz & Yogeeswaran, 2011; Cadinu & Reggiori, 2002; Harmon-Jones, Greenberg & Solomon, 1996), and support for extreme military interventions (Pyszczynski et al., 2006) toward out-groups. This kind of intolerance and aggression toward out-groups are in themselves a form of worldview defense and are expressions of anxiety buffers after perceived threat (Jonas & Fritsche, 2013).

In sum, we expected that being exposed to intergroup threat provokes aversive emotional reactions and these reactions again influence

subsequent attitudes toward the out-group. Further, interventions can be introduced to modify this process.

1.5. Intergroup Emotions and their Association with Intergroup Attitudes

Individuals form part of social groups and, consequently, social identity forms an important part of the self. These processes are described in the social identity (Tajfel & Turner, 1979) and self-categorization theories (Turner, 1987). Based on their social identity and group membership, the individuals appraise their surroundings in relation to this social identity, and these appraisals again generate emotions (Smith, 1993). Herein lies the basis for the Intergroup Emotions Theory (IET; Smith & Mackie, 2008). Individuals identify with an in-group and appraise situations in relation to their implications for the in-group (Smith & Mackie, 2015). This appraisal mechanism operates automatically, but can also sometimes be conscious (Moors et al., 2013). The appraisals generate emotions, which again affect the resulting action tendencies and intergroup behaviors (Smith & Mackie, 2016), although the causal direction is likely not unidirectional since emotions can also affect appraisals (Smith & Mackie, 2008). Intergroup emotions can be understood and analyzed within the frameworks of general emotion theories, such as the appraisal theories of emotion (e.g. Frijda, 1988; Moors et al., 2013). Further, intergroup emotions are similar to individual-level emotions in how they are experienced and in their effects on cognition, perception and motor processes. The difference to individual-level emotion is that intergroup emotions are elicited as a function of the group identity that is currently activated (Smith & Mackie, 2008). For example, when visiting a genocide memorial museum, the guests are likely to experience different emotional reactions depending on whether they identify with the victimized group, the perpetrators or view themselves as external, neutral spectators.

Intergroup emotions are important in the formation of attitudes and behavior toward outgroups (Smith & Mackie, 2016). For example, it has been shown that group-based emotion components can exert a stronger effect on collective action than non-affective components (van Zomeren, Postmes & Spears, 2008). Previous studies have additionally shown the importance of emotions in the formation of political (Groenendyk, 2011; Skitka, Bauman, & Mullen, 2004) and intergroup attitudes (DeSteno,

Dasgupta, Bartlett, & Cajdric, 2004; Mackie, Smith, & Ray, 2008). For example, Miller, Smith and Mackie (2004) found that emotions had direct effects on prejudice and that emotions also mediated the effects of intergroup contact and political predispositions on prejudice. Feeling humiliated on behalf of the group one identifies with has been identified as a driving factor behind hostility toward the out-group (Golec de Zavala, Peker, Guerra, & Baran, 2016), political radicalization and violence (McCauley & Moskalenko, 2008). Relatedly, Smith and Mackie (2016) suggested that regulation of group-based emotions may potentially shift people's action in conflict.

A potent source for negative intergroup emotions (e.g. anger, fear, resentment or disgust; Cottrell & Neuberg, 2005), and subsequent negative intergroup attitudes, is perceived intergroup threat (Riek, Mania & Gaertner, 2006). Humans, as certain other species, have developed into social beings, likely because individual success (e.g. in gaining essential resources) has generally been greater when it has been based on group cooperation compared to if the individual acted alone. Therefore, it is likely that group members are sensitive to factors appraised as potential threats to their group's resources and cooperation (Cottrell & Neuberg, 2005) such as various intergroup threats. As can be concluded based on the general model of threat and defense (Jonas et al., 2014), the appraisal theories of emotion (e.g. Frijda, 1988; Moors et al., 2013) and the Intergroup Emotions Theory (Smith & Mackie, 2016), these threat appraisals evoke aversive emotions, which again trigger action tendencies. Gorodzeisky and Semyonov (2016) investigated patterns of anti-immigrant attitudes with data from 19 European countries. They found that competitive threat, that is, fear of competition (actual or perceived) for resources due to increased immigration in a community, was associated with increased prejudice toward immigrants. This finding corresponds to the Intergroup Emotions Theory, which shows that perceived threat from an out-group is associated with negative affect and negative attitudes toward that group. Moreover, ethnic and cultural differences may represent a symbolic threat to the majority culture, that is, through differences in, among others, values, norms, beliefs and attitudes (Stephan, Ybarra, & Bachman, 1999). Reflecting this, Gorodzeisky and Semyonov (2016) found in their analysis that individuals expressing racial prejudice toward non-Whites also tended to have higher anti-immigrant attitudes. Further support for the role of realistic threat in negative out-group attitudes was presented by Kuntz et al. (2017), who investigated immigration attitudes in 14 European

countries before and after the 2008 economic crisis. They found that subjectively perceived insecure economic conditions, more strongly than objective economic indicators, were associated with anti-immigration attitudes. This implies that when the public perceives their material resources as threatened, the hostility toward immigrants increases—likely because immigrants are seen as an additional competition for resources (e.g., for jobs, social security). In addition, it seems that the negative attitudes may also transfer to other out-groups than those directly associated with the threat. For example, Bouman, van Zomeren and Otten (2015) found that perceived distant, realistic threats transferred into intolerance toward local out-groups that were associated with the distant threatening out-group.

Another intriguing area of research that combines emotions and intergroup attitudes concerns the emotion of disgust as a reaction to a perceived threat of disease. A linkage has been suggested between disease-avoidance (through disgust) and xenophobic attitudes (Faulkner, Schaller, Park, & Duncan, 2004; Park, Faulkner, & Schaller, 2003), and several studies have linked disgust and ethnocentric, prejudiced or negative out-group attitudes (e.g. Aaroe, Petersen, & Arceneaux, 2017; Inbar, Pizarro, & Bloom, 2012; Katzir & Liberman, 2019; Matsumoto, Hwang, & Frank, 2017; Terrizzi, Shook, & Ventis, 2010). Hodson and Costello (2007) found a positive association between high interpersonal disgust sensitivity and negative out-group attitudes, mediated via dehumanizing perceptions of immigrants. As discussed by Schaller and Park (2011), throughout human history pathogens have posed a risk for infection and hence threatened survival. Humans have therefore evolved an immune system to defend against disease. The physiological immune system is, however, resource costly and consequently humans evolved a first line of defense; the behavioral immune system. The behavioral immune system detects possible pathogens in the environment and triggers the aversive emotion of disgust, which prompts the individual to avoidance before the pathogens come in contact with the organism. However, since a false-negative error could potentially be fatal for the organism, the system is sensitive to a great number of clues that merely resemble symptoms of pathogen infections. This leads to many false-positive errors. As a result, the system sensitively produces aversive reactions to people who may pose a risk for pathogen transmission, for example, people with anomalous physical appearance (Schaller & Park, 2011) or people with clues indicating

that they are foreign to one's own group (Faulkner et al., 2004). This may contribute to discriminatory behavior (Schaller & Park, 2011).

To recapitulate, extensive literature indicates that intergroup threat gives rise to negative intergroup emotions. Negative emotions on their part influence attitudes and cognitions. A plausible conclusion from this process is that preventing the emergence of negative intergroup emotions could result in more positive intergroup attitudes.

1.6. Emotion Regulation and Intergroup Attitudes

Given the earlier research on negative intergroup emotions and their role in negative attitudes toward out-groups, a relevant question is whether modifying those emotions would result in changed out-group attitudes. A similar idea was proposed by Hodson and Costello (2007). They found that interpersonal disgust predicted dehumanizing perceptions of immigrants and suggested that out-group dehumanization could possibly be decreased by desensitizing individuals to disgust reactions. The possibility of altering out-group attitudes via modifying intergroup emotions has since been explored in large part within intractable conflict settings. Halperin, Pliskin, Saguy, Liberman and Gross (2014) found a negative association between political intolerance and the use of cognitive reappraisal in Israeli citizens during the Gaza War in 2009. Further, they found causal effects showing that for participants with more proneness toward political intolerance, the use of reappraisal decreased both negative emotion and intolerance. Halperin, Porat, Tamir and Gross (2013) found that among Israeli participants, the use of cognitive reappraisal decreased the level of anger and support for aggressive policies toward the Palestinians, and it increased support for conciliatory policies toward the Palestinians. They also found that the effects of reappraisal persisted up to a 5-month follow-up assessment. Alkoby, Halperin, Tarrasch and Levit-Binnun (2017) found that training in mindfulness and cognitive reappraisal (combined, and with a tendency also individually) increased support for compromise within the violent Israel-Palestinian conflict and the effect was mediated by a reduction in negative emotions toward Palestinians.

Focusing on mindfulness, a few studies have assessed its relationship to out-group attitudes. Lueke and Gibson (2016) found that among White

participants, a brief mindfulness training resulted in less discriminatory behavior toward Black individuals compared to control conditions. On the other hand, Nicol and France (2018) found little relationship between trait mindfulness and measures of prejudice toward a number of different out-groups. As the authors discuss, the mindfulness measures they used covered attention components, which direct the individual's attention to the present moment, toward the self and the inner experiences in a non-judgmental manner. This, however, may not necessarily translate into accepting and having non-judgmental attitudes toward *other* individuals. However, other meditation components may, for example those including practices in loving-kindness (Nicole & France, 2018).

A number of studies have assessed the role of other emotion regulation strategies in out-group attitudes. Roth, Shane and Kanat-Maymon (2016) studied how integrative emotion regulation affected empathy and Jewish Israelis' support for humanitarian aid in Gaza. Integrative emotion regulation was defined as the ability to experience negative emotions, understand their source and use this information in regulating the behavioral response (Roth et al., 2014). The results from Roth et al.'s (2016) study showed that integrative emotion regulation predicted support for conciliatory policies toward the Palestinians and this association was mediated by the ability to empathize with others. Presenting results from another setting, Steele, Rovenpor, Lickel and Denson (2017) found that, by decreasing anger, the emotion regulation strategy of reflection, compared to rumination and a control condition, reduced bias toward Muslims shortly after the Boston Marathon bombings.

Compared to more functional forms of emotion regulation, there have been fewer studies on the role of emotion dysregulation on out-group attitudes. Zipris, Pliskin, Canetti and Halperin (2018) found that within an intractable conflict, exposure to political violence predicted group-based humiliation (i.e. feeling humiliation on behalf of the group one identifies with), which again predicted support for militant action and collateral damage, but only among participants who showed high scores in emotion dysregulation. Schlachter and Duckitt (2002) found in a predominantly White, clinical sample that an avoidant-negativistic personality characteristic (which is generally associated with emotion dysregulation) was indirectly, positively associated with prejudice toward Black individuals, mediated via negative affective symptoms.

In sum, the previous literature hence indicates that effective downregulation of negative intergroup emotions may improve intergroup attitudes.

1.7. Association between PTSD, Emotion Processes and Negative Out-group Attitudes

During the work on the present thesis, Finland experienced its first documented Islamist terror attack. Though tragic, the event provided us with the opportunity of assessing the effects of a recent, real and impactful intergroup threat. The nature of the terror attack and the public's reactions to it prompted us to include measures of PTSD in our analyses. Earlier research has found that posttraumatic stress disorder, dysfunctional emotion regulation and negative out-group attitudes are interconnected. PTSD is a clinical phenomenon that has notable effects on emotion processing and is associated with maladaptive emotion regulation (Boden et al., 2013). The condition is characterized by avoidance of reminders of the traumatic event and the associated aversive emotional reactions (Foa & Rothbaum, 1998), as well as overly negative appraisals of the traumatic event and its consequences, as outlined in cognitive models of PTSD (Ehlers & Clark, 2000). As suggested by Boden et al. (2013), this may indicate that individuals with PTSD use expressive suppression excessively and under-utilize cognitive reappraisal. This view was supported by the results of their study: reductions in the use of expressive suppression and increases in the use of cognitive reappraisal over the course of clinical treatment predicted decreased PTSD severity (Boden et al., 2013).

In addition to emotions and dysfunctional emotion regulation, PTSD is also associated with prejudice and negative out-groups attitudes, especially in relation to traumatic stressors that involve terrorism. Goodwin, Kaniasty, Sun and Ben-Ezra (2017) investigated the reactions following the 2015 terror attacks in Paris (which targeted the editorial staff of the magazine Charlie Hebdo and the visitors at the Bataclan concert hall). They found that those participants who were more distressed following the attacks exhibited more racism and were less willing to interact with Muslims. The authors parallel this finding with results reported by Hobfoll, Canetti-Nisim and Johnson (2006) from a study in Israel-Palestine about exposure to terror or war-related events since the

beginning of the Al Aqsa Intifada. The authors found that PTSD symptoms were related to greater ethnocentrism. This finding also supports the stress-based model of political extremism proposed and tested by Canetti-Nisim, Halperin, Sharvit and Hobfoll (2009), according to which exposure to terrorism predicts psychological distress, which predicts increased perceived threat, which then predicts hostility toward the out-group associated with the threat. The authors note that since threat perceptions and psychological distress mediate the relationship between terrorism exposure and hostile attitudes toward out-groups, subjective psychological processes such as appraisals are important to consider (Canetti-Nisim et al., 2009). This suggests, for example, that cognitive reappraisal may play an important role in modifying the formation of negative attitudes after exposure to terrorism.

Conceptually, PTSD could be seen as a moderator within the model depicting the effect of emotion regulation on out-group attitudes. The PTSD symptoms, and hyperarousal especially, may hinder an effective downregulation of negative emotions. This difficulty may be further aggravated by negative cognitions and appraisals, which are core symptoms of PTSD (American Psychiatric Association [APA], 2013). As a result, negative emotions (here: intergroup emotions) are more likely to prevail and, in turn, influence related out-group attitudes. Based on the earlier literature we, hence, hypothesized that individuals with higher levels of posttraumatic reactions after the Turku terror attack would be less able to downregulate negative emotions and would express more negative intergroup attitudes as a result.

2. Aims

Previous research has provided support for the importance of emotions in negative out-group attitudes and prejudice (Talaska, Fiske, & Chaiken, 2008). The general aim of the present thesis was to investigate whether modifying those emotions could produce a change in negative out-group attitudes. We investigated the role of emotion regulation in out-group attitudes and prejudice, which have traditionally been studied from a cognitive perspective (Miller et al., 2004; Talaska et al., 2008). In the last decade, however, increased attention has been directed toward for the role of emotional processes (Miller et al., 2004), including emotion regulation processes. Nevertheless, previous research on the relationship between emotion regulation and intergroup attitudes has been largely focused on settings with active conflict (i.e., the Israel-Palestine conflict). Moreover, the studies investigating emotion regulation and its relationship with out-group attitudes have often relied on samples of university students. We investigated the role of emotion regulation on broader aspects of prejudice in a generally peaceful context. To strengthen the generalizability of the results, we recruited population-based samples.

On a broader scale, we also strived to establish some new conceptual directions and extend the basic conceptual model on emotion regulation and out-group attitudes. We assessed how the original model on emotion regulation and out-group attitudes was influenced by a number of related factors. One group of such variables were those that likely influence an individual's abilities to apply emotion regulation strategies when instructed, such as habitual emotion regulation and certain psycho-pathological symptoms. Another group of factors related to the experience and appraisal of the threat itself, such as physical distance to the threatening event and the individual's psychological involvement in it. The final group of variables were such demographic factors that likely influence emotion regulation processes, namely gender and education.

Table 1 presents an overview of the studies, research questions, participants and methods.

Given that habitual emotion regulation was one of the central variables throughout the present thesis, it was essential to establish the psychometric qualities of the instruments used to measure emotion regulation at trait level. The aim of **Study I** was, therefore, to use a Finnish

population-based sample to psychometrically evaluate Finnish translations of two commonly used measures of habitual emotion regulation; the Emotion Regulation Questionnaire (ERQ; Gross & John, 2003; Vuorela & Nummenmaa, 2004) and the Difficulties in Emotion Regulation Scale (DERS-16; Bjureberg et al., 2016; Tapolaa, Lappalainen & Wahlström, 2010). In addition, we assessed how age and gender were associated with responses on the two measures.

The aim of **Study II** was to investigate the relationship between habitual emotion regulation and out-group attitudes, as well as investigate whether the association was influenced by gender. We used the results from this study to guide our further research questions.

In **Study III,** we investigated whether interventions targeting emotion regulation could affect out-group attitudes after exposure to threatening stimuli. In order to improve the ecological validity, we used real news material consisting of different kinds of intergroup threats. A previous report had found an association between media consumption and negative intergroup emotions toward outgroups, through perceived threat (Atwell Seate, Ma, Chien, & Mastro, 2018). We further assessed whether the effects of the emotional regulation strategies on out-group attitudes were moderated by habitual emotion regulation or political ideology.

In **Study IV**, we assessed whether modifying emotional reactions when reminded of a real terror attack would affect attitudes toward out-groups perceived to be associated with the attack. We also tested whether the effect was stronger in a population more directly affected by the terror attack, compared to a population more distally affected by the attack. Additionally, we assessed if the reactions were influenced by physical and psychological distance to the attack, or by posttraumatic stress symptoms.

3. Materials and Methods

3.1. Design

We employed both experimental and non-experimental designs in the present studies. For Studies I and II we used a cross-sectional design to explore associations between our variables of interest. Studies III and IV were experimental studies. Figure 1 illustrates the basic design of the experimental studies.

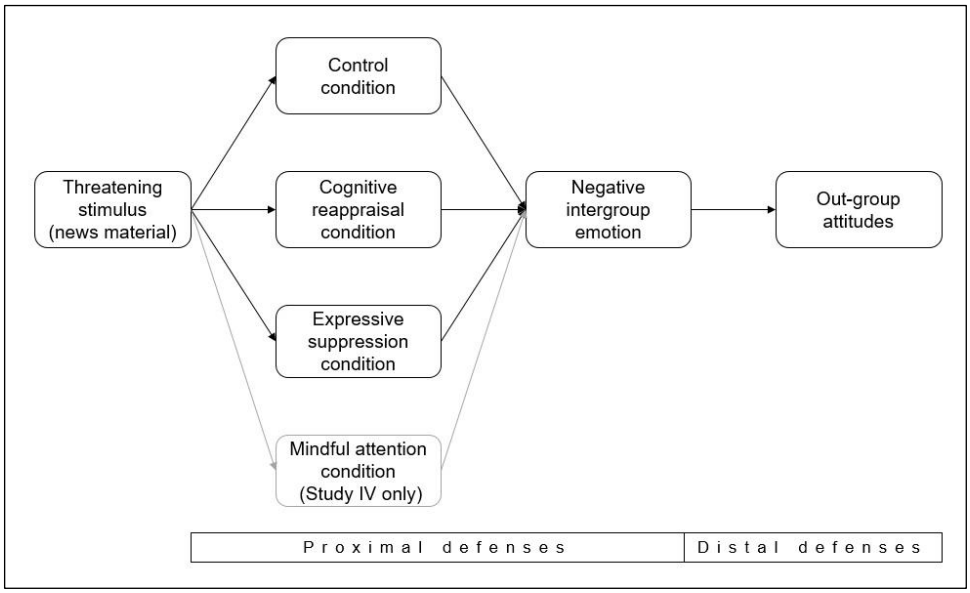

Figure 1. The basic design of the experiments in Studies III and IV. Proximal and distal defenses refer to the theories of psychological threat and defense (see section 1.4).

3.2. Participants

The participants to all studies came from three random, population-based samples of 18-64 years old Finnish-speaking individuals drawn from the Finnish Population Register Centre. The Population Register Centre holds the addresses of all people currently living in Finland. To secure sufficiently strong statistical power, we sent invitations to a large number of individuals. For Studies I-II, we drew a random sample of 5000

individuals and invited them to participate in the study. A total of 316 participants (6.3%) completed the whole survey. When including the participants who entered the survey web page and/or completed the survey partially, we reached 636 (12.7%) participants. For Study I, 409 participants completed the whole ERQ and 400 completed the whole DERS-16. For Study II, the total number of participants who responded to the items included in the hypothesis testing was 320.

Similarly, in Study III we targeted a sample of 5000 individuals and randomly assigned them to either the reappraisal condition (2000 individuals), suppression condition (2000 individuals) and control condition (1000 individuals). In total, 349 (7%) individuals completed the whole assessment.

For Study IV, we sent invitation letters to a sample of 5000 individuals residing in two Finnish cities: 2500 individuals in Turku (where a terror attack took place) and 2500 individuals in Tampere (a similar size city where no attack took place). In total 889 (17.8%) participants responded to the survey at least partially. Data from 501 (10%) participants were used for hypothesis testing.

We compared the demographics of our samples to the general population structure of Finland (Official Statistics of Finland, 2018a). The gender ratio in Studies I-III corresponded largely to the population gender ratio; in Studies I-II there were around 7 percentage points more women and less men than in the general population, and in Study III the corresponding number was approximately 3 percentage points. In Study IV, the gender ratio was somewhat more skewed; 11 percentage point more women and less men than in the general population. When it comes to age groups, in Studies I and II, the age group 18-29 was seven percentage points and the age group 30-39 five percentage points larger than in the general population. The differences for the other age groups in Studies I-III were smaller than that (0-4 percentage points). The samples were somewhat more educated than the population in general; the proportion of Finns having completed no more than basic education is around 18%. The corresponding value in the samples was around 7% (Studies I-III) and 4% in Study IV. The share of the general population with a master's degree or above is about 12%, whereas in the samples the amount was circa 22-26%. The proportion of participants with a bachelor's degree was between 7 (Studies I-II) and 13 percentage points (Study III) above the general population.

3.3. Online Data Collection

All the studies were conducted online. Several researchers have compared data collections conducted online versus those where data have been collected traditionally on paper-and-pencil, and generally found the two methods to produce equivalent results and psychometric properties (e.g. Bagby, Ayearst, Morariu, Watters, & Taylor, 2014; De Beuckelaer & Lievens, 2009; Hirai, Vernon, Clum, & Skidmore, 2011; Holländare, Andersson, & Engström, 2010; Vallejo, Jordán, Díaz, Comeche, & Ortega, 2007; Weigold, Weigold, & Russell, 2013).

3.4. Instruments

The main instruments used in the present thesis are outlined below. For further information about the instruments, please refer to the original publications and the Appendix.

3.4.1. Emotion Regulation Questionnaire (Studies I-IV)

The 10-item Emotion Regulation Questionnaire (Gross & John, 2003) is used to measure two emotion regulation strategies; cognitive reappraisal and expressive suppression. The answers on the scale are recorded using a 7-point Likert scale (1 = *strongly disagree*, 7 = *strongly agree*). The scale has been validated in student samples (Balzarotti, John, & Gross, 2010), and European community samples (Balzarotti et al., 2010; Cabello, Salguero, Fernández-Berrocal, & Gross, 2013; Enebrink, Björnsdotter, & Ghaderi, 2013; Wiltink et al., 2011). The Finnish translation of the ERQ was obtained from the Stanford Psychophysiology Lab Resources web site (spl.stanford.edu/resources).

3.4.2. Difficulties in Emotion Regulation Scale (Studies I-IV)

Emotion dysregulation was measured using a short 16-item version (DERS-16; Bjureberg et al., 2016) of the original 36-item Difficulties in Emotion Regulation Scale (Gratz & Roemer, 2004). The authors of the DERS-16 found the scale to be of strong psychometric quality exhibiting excellent internal consistency, good test-retest reliability, and good

convergent and discriminant validity (Bjureberg et al., 2016). The DERS-16 was selected for the present thesis over other available short versions of the DERS with equally strong psychometric properties (Kaufman et al., 2016; Victor & Klonsky, 2016) because it was partly validated in a clinical sample in Sweden, a cultural setting similar to the Finnish one. The Finnish translation of the 16 items was compiled from a translation of the original DERS (Tapolaa, Lappalainen & Wahlström, 2010).

3.4.3. Verbal Emotions (Studies III and IV)

There are two major approaches to study emotions; the basic emotions approach and the dimensional approach (Poels & Dewitte, 2006). The basic or discrete emotions perspective states that there are a number of distinct, separate and evolutionarily shaped emotions, which are universal. Examples on such emotions are anger, disgust, fear and enjoyment –evolved emotions that help individuals deal with adaptive situations in life (Ekman, 1992). Several verbal self-report measures have been developed to measure emotions based on the basic emotion approach (Richins, 1997), for example the Differential Emotions Scale by Izard (1977) and the Emotions Profile Index (Plutchnik, 1980).

In **Study III**, we asked the participants to indicate on a 7-point Likert-type scale how much of the emotions sadness, pleasure, anger, disgust, anxiety, fear and joy they felt (1 = not at all to 7 = very much).

In **Study IV**, we used a slider bar between 1 (not at all) and 100 (very much) to ask how much anger, fear, joy, sadness and anxiety the participants felt. We performed the measurement twice; at the beginning of the survey and after the presentation of the stimulus material.

3.4.4. Self-Assessment Manikin (Study III)

The basic emotions view differs from the dimensional perspective on emotions, in which emotions are viewed as more similar to each other, but differing in the levels of the three dimensions of pleasantness, arousal and activity (Ekman, 1992). The scales based on the dimensional approach do not unequivocally separate between different emotions per se, but rather the underlying dimensions (Richins, 1997). Examples on such scales are the verbal pleasure-arousal-dominance scale (PAD scale; Mehrabian & Russell, 1974) and the non-verbal Self-Assessment Manikin (SAM; Lang,

1980; Bradley & Lang, 1994). We used the latter to measure non-verbal emotions in Study III. SAM is a nonverbal instrument with figures depicting a 9-point range of each of three affective dimensions (happy-unhappy, calm-aroused, and inferior-dominant). Earlier studies, though limited in number, have found the SAM to possess adequate psychometric qualities (Backs, Da Silva, & Han, 2005; Bradley & Lang, 1994).

3.4.5. Attitudes toward Out-groups (Studies II-IV)

For **Studies II** and **III**, in line with the study conducted by Duckitt and Sibley (2007), a list of minorities was compiled of 26 different political, ethnic, sexual, cultural, religious, health-related and socioeconomic groups in Finland: Atheists, Christians, Muslims, Jews, migrants from the Middle East, migrants from Africa, right-wingers, feminists, left-wingers, Sami people, Finland-Swedes, Finland's Roma people, Russians, individuals with high income, Romanian beggars, persons living on disability pension, housewives, unemployed, gay persons, trans persons, people with physical disability, elderly, sex workers, obese persons, persons with a substance use disorder, and psychiatric patients (see Appendix 1 for contextual information on the out-groups). Some of these groups may overlap.

In **Study II**, the aim regarding bias assessment was to cover a broad range of societal groups in order to investigate how negative and positive attitudes toward out-groups are distributed, but also to include the main groups that have been reported to face prejudice in Finland (Korhonen, Jauhola, Oosi, & Huttunen, 2016; Ministry of the Interior, 2014). Another aspect we considered was that the groups would likely represent different levels of threat (Korhonen, Jauhola, Oosi, & Huttunen, 2016). The participants were asked to report their general views regarding out-groups on a Likert-type scale, with response alternatives from 1 (*very negative*) to 7 (*very positive*). The participants were also asked to record those groups that they possibly identified with themselves to control for this in the analyses.

In **Study III**, we used the same groups, but divided them into groups that were targeted by the stimulus material (i.e., migrants from the Middle East and Africa, persons with high income, Russians, and mental health patients) and those who were not. We asked the participants to report their general views on a Likert-type scale (from 1 = *very negative* to 7 = *very*

positive). We again asked the participants to report which of the out-groups they identified with themselves.

In **Study IV**, we used a slider bar from 1 (very negative) to 100 (very positive) to ask the participants about their general views of groups potentially perceived to be associated with the attack that was described in the stimulus material (i.e., immigrants from the Middle East, immigrants from Africa, Moroccans, Muslims, groups positive to immigration) and other groups (groups critical to immigration, elderly, gay persons, Christians, feminists, Finland-Swedes, people with high income, people with substance use disorder). With the inclusion of the groups not directly associated with the attack, we wanted to be able to assess whether the expected reactions would generalize to out-groups overall.

3.4.6. Forced-Choice Test (Study II)

Given that the assessment of attitudes that violate existing social norms (like racism) is prone to social desirability bias (Krumpal, 2013), we also employed a forced choice test including six out-groups (Finland-Swedes, Migrants from developing countries, Muslims, Gay persons, Unemployed, Disabled) for a comparison with the self-reported attitudes in **Study II**. This format controls some ways of distorting answers in a socially desirable way (Martin, Bowen, & Hunt, 2002) since the participants are asked to choose one preferred group of two options instead of using a Likert type scale where it is possible to give low (or high) scores to every group. In addition, analyses of paired forced-choice data allow for interpreting outcomes on an interval scale (Kingdom & Prins, 2016).

3.5. Statistical Analyses

All statistical analyses were conducted using SPSS 24.0, except for the forced-choice test, which was performed using R (R Development Core Team & R Core Team, 2008) with the prefmod-package (Hatzinger & Dittrich, 2012). The confirmatory factor analyses were conducted using AMOS 24.0 (Arbuckle, 2016). Moderation and mediation analyses were conducted with the PROCESS macro for SPSS (Hayes, 2018).

In **Study I**, we first performed an exploratory factor analysis on the ERQ and DERS-16 scales and then tested the suggested models with confirmatory factor analysis. The factor structures were inspected using

maximum-likelihood estimation. The effects of age and gender were assessed with MANOVAs. The mean scores of the subscales were compared between gender and age groups using Bonferroni-corrected *t*-tests.

In **Study II**, the associations between the ERQ subscales, the DERS-16 and the acceptance of out-groups were examined using a linear regression model. We used the PROCESS macro (Hayes, 2018) for the moderation analyses to assess for the influence of gender and self-identification.

In **Study III**, we used *t*-tests to compare the emotional responses between both experimental groups and the control group. We used an ANOVA to compare the attitudes toward target and non-target out-groups between all experimental groups. We used the PROCESS macro for SPSS (Hayes, 2018) to assess whether self-identification with the out-groups affected the main effect. We also used PROCESS (Hayes, 2018) to conduct the mediation analyses.

In **Study IV**, we tested for differences in emotional reactions, out-group attitudes, and posttraumatic reactions among participants in Turku and Tampere using *t*-tests. The association between physical distance and negative emotions was assessed using regression. The relationships between negative emotions and psychological proximity and posttraumatic symptoms were assessed with correlations. We conducted the mediation and moderated mediation analyses using PROCESS (Hayes, 2018). To test for differences in emotional reactions and out-group attitudes between experimental conditions, we employed ANOVAs with planned comparisons. We assessed the relationship between negative emotions and out-group attitudes with regression.

Additional meta-analyses for this thesis summary were conducted with Hedges-Vevea random-effects models using SPSS scripts by Field and Gillett (2010).

Table 1

Overview of the samples, measures and research questions for Studies I-IV

Study	*n*	Measures	Research questions
I	409 (ERQ); 400 (DERS)	ERQ, DERS-16	Factor structure of ERQ and DRS-16 Association with age and gender for ERQ and DERS 16
II	320 (same data collection for samples I-II)	ERQ, DERS-16, stress measure, out-group attitudes, forced choice test, ER-IAT	Association between habitual ER and out-group attitudes; moderation by gender
III	317	ERQ, DERS-16, stress measure, left-right ideology, SAM, verbal emotions, out-group attitudes (target and non target)	Association between habitual ER and out-group attitudes Causal effects of ER strategies on out-group attitudes; moderation by habitual ER and political ideology
IV	501	ERQ, DERS-16, IES-R, verbam emotions, psychological proximity to attack site, physical proximity to attack site, out-group attitudes (target and non-target)	Association between habitual ER and out-group attitudes Causal effects of ER strategies on out-group attitudes; moderation by habitual ER Association between negative emotions and out-group attitudes Moderation of physical and psychological proximity on the main effects Association between PTSD symptoms and emotional and attitudinal reactions

Note. ER = Emotion regulation, ERQ = Emotion Regulation Questionnaire, DERS-16 = Difficulties in Emotion Regulation Scale16, SAM = Self-Assessment Manikin, IES-R = Impact of Events Scale-Revised, PTSD = Posttraumatic Stress Disorder

4. Results

Details regarding the statistical tests are reported in the original publications (see Appendices).

4.1. Psychometric Properties of ERQ and DERS-16

In our first study, we assessed the psychometric properties of our two main measures, the Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) and the Difficulties in Emotion Regulation Scale-16 (DERS-16; Bjureberg et al., 2016). For the ERQ, we found support for the original two-factor structure after we eliminated one item (item nr. 5 from the reappraisal scale) due to low loadings. We found support for a five-factor structure for DERS-16, after we dropped two items (nr. 14 and 16) due to cross loadings. Both scales showed adequate internal consistencies, but further validation studies in the Finnish context should be conducted.

4.2. Habitual Emotion Regulation

In all studies, cognitive reappraisal as measured with the ERQ showed higher mean scores than expressive suppression. In addition, the habitual use of expressive suppression correlated positively with emotion dysregulation.

To investigate the relationship between habitual emotion regulation and two demographic variables, education and gender, we performed some additional analyses for this thesis summary as reported below.

4.2.1. Associations between Habitual Emotion Regulation and Education

In **Study II** we found no association between education level and cognitive reappraisal or expressive suppression. There was a small, negative correlation between emotion dysregulation and education level. In **Study III**, cognitive reappraisal was not associated with education level. On the other hand, there was an association between education level and expressive suppression and emotion dysregulation. Lastly, in **Study IV** education level did not correlate with cognitive reappraisal nor expressive

suppression. Emotion dysregulation, again, was negatively associated with education level.

4.2.1.1. Meta-Analysis of the Influence of Education

We aggregated the results from our three correlational analyses on habitual emotion regulation and education to establish their overall association. Using a random-effects meta-analysis we found that for cognitive reappraisal, the association with education was not statistically significant (r = .01, 95% CI [-.04, .07], z = 0.49, p = .627, k = 3, n = 1138). Similarly, for expressive suppression there was no significant association with education (r = -.05, 95% CI [-.14, .04], z = 1.02, p = .310, k = 3, n = 1138). On the other hand, the aggregated relationship between emotion dysregulation and education was significant; (r = -.12, 95% CI [-.18, -.07], z = 4.15, p < .001, k = 3, n = 1138), with lower education level being associated with increased emotion dysregulation.

4.2.2. Associations between Emotion Regulation and Gender

In **Study I**, women used cognitive reappraisal slightly more than men. Expressive suppression was reported at moderately higher levels by men than women. There were no effects of gender on the emotion dysregulation measure. In **Study III**, there were no differences in the level of cognitive reappraisal nor emotion dysregulation between the genders. Expressive suppression, on the other hand, was moderately higher among men than women. In **Study IV**, women had somewhat higher levels of cognitive reappraisal than men, and men again had moderately higher levels of expressive suppression than women. For emotion dysregulation, the difference did not reach significance.

4.2.2.1. Meta-Analysis of the Influence of Gender

We conducted random-effects meta-analyses to assimilate the effects from our three samples with a total of 509 men and 716 women. This yielded a significant effect size for gender effects in expressive suppression; (d = .57, 95% CI [.46, .69], z = 9.67, p < .001, k = 3, n = 1225), with men using more expressive suppression than women. Women again used more cognitive reappraisal than men; (d = .25, 95% CI [.14, .37], z = 4.35, p < .001, k = 3, n = 1225). Emotion dysregulation showed the smallest gender

effect, (d = .13, 95% CI [.01, .24], z = 2.08, p = .038, k = 3, n = 1225), with women reporting more emotion dysregulation than men.

4.3. Attitudes toward Out-Groups

In **Studies II-IV**, we employed measures about attitudes toward different out-groups. Table 2 displays the means and standard deviations of those attitudinal measures.

Table 2

The means and standard deviations for the measures on out-group attitudes in Studies II-IV

Study II (n = 320)			Study III (n = 317)			Study IV (n = 501)		
Group	*M*	*(SD)*	Group	*M*	*(SD)*	Group	*M*	*(SD)*
Elderly	5.89	(1.21)	Elderly	5.81	(1.18)	Elderly	81.63	(20.98)
Sami people	5.53	(1.21)	Sami people	5.63	(1.23)	Gay persons	77.40	(26.25)
Housewives	5.46	(1.26)	Housewives	5.46	(1.24)	Finland-Swedes	74.34	(24.87)
People with physical disability	5.28	(1.34)	People with physical disability	5.32	(1.24)	Persons with high income	66.69	(24.20)
Gay persons	4.93	(1.59)	Finland-Swedes	5.08	(1.36)	Christians	65.46	(26.38)
Finland-Swedes	4.92	(1.40)	Gay persons	4.94	(1.49)	*Groups positive to Immigration	55.92	(29.79)
Christians	4.89	(1.47)	Atheists	4.91	(1.41)	Feminists	55.43	(30.17)
Persons on disability pension	4.78	(1.29)	Christians	4.85	(1.38)	*Immigrants (Africa)	44.88	(26.15)
Atheists	4.76	(1.52)	Jews	4.77	(1.27)	*Muslims	42.06	(26.68)
Persons with high income	4.75	(1.30)	Persons on disability pension	4.68	(1.24)	*Moroccans	41.85	(27.23)
Jews	4.73	(1.36)	Transgender persons	4.50	(1.41)	*Immigrants (Middle East)	39.69	(25.74)
Mental Health Patients	4.48	(1.36)	*Persons with high income	4.37	(1.28)	Persons with substanse use disorder	30.95	(22.62)
Transgender persons	4.36	(1.67)	*Mental Health Patients	4.37	(1.24)	Groups Critical to Immigration	30.83	(27.24)
Unemployed	4.35	(1.31)	Unemployed	4.35	(1.26)	Other groups	58.75	(14.10)
Overweight persons	4.14	(1.43)	Overweight persons	4.13	(1.32)	*Attack-associated groups	46.02	(24.35)
Right-wingers	4.12	(1.32)	Right-wingers	4.10	(1.42)			
Left-wingers	4.10	(1.47)	Left-wingers	4.06	(1.47)			
Feminists	4.08	(1.68)	Feminists	3.97	(1.59)			
Russians	3.92	(1.38)	*Russians	3.92	(1.35)			
Immigrants (Africa)	3.73	(1.57)	Sex workers	3.75	(1.30)			
Sex workers	3.54	(1.47)	*Immigrants (Africa)	3.55	(1.46)			
Finland's Roma people	3.46	(1.46)	Muslims	3.32	(1.44)			
Muslims	3.41	(1.58)	*Immigrants (Middle East)	3.32	(1.40)			
Immigrants (Middle East)	3.32	(1.57)	Finland's Roma people	3.23	(1.39)			
Romanian beggars	2.43	(1.37)	Romanian beggars	2.33	(1.21)			
Persons with substanse use disorder	2.25	(1.24)	Persons with substanse use disorder	2.32	(1.19)			
			Non-target out-groups	4.36	(0.70)			
			*Target out-groups	3.90	(0.84)			

Note. The verbal anchors used in the out-group attitude scales were 1 (very negative) to 7 (very positive) (Studies II and III), and 1 (very negative) to 100 (very positive) (Study IV).

4.3.1. Latent Constructs of Out-Group Attitudes

Using the data from **Study II**, we explored whether the attitudes toward the different out-groups are explained by a generalized, single-factor model or by different latent constructs. The aim was to investigate whether the responses would have logical, underlying dimensions and to add information about the measurement instruments. Moreover, we wanted to investigate whether the processes underlying the attitudes toward certain groups could be better understood.

The initial Exploratory Factor Analysis using Generalized Least Squares with oblique rotation detected five factors with eigenvalues over 1 (8.25, 3.07, 1.88, 1.63, 1.29). The scree plot similarly supported a five-factor solution. The interpretation of the extracted factors was relatively evident. The first factor was labelled *ethnic groups* and included groups that are generally ethnically distinct from the majority of Finnish nationals; migrants from the Middle East, migrants from Africa, Romanian beggars, and Muslims. The second factor loaded on groups that may generally be seen as actively departing from the mainstream norms and was labelled *antinormative groups*; gay persons, trans persons, and atheists. The third factor loaded on a seemingly broader array of groups; elderly, Sami people, housewives, people with physical disability, Jews, Christians, persons living on disability pension, mental health patients, unemployed and obese persons. At first glance, these groups seem to represent very distinct groups, however, the factor uniting them is that they are internal groups in the Finnish society, who may be perceived as differing from the mainstream. We named this last factor *internal differing groups*. The fourth factor was named *crime-associated out-groups* and contained three groups; persons with substance use disorder, sex workers and Finland's Roma people, who have previously been stereotyped as engaging in criminal activities. Romanian beggars, who are often in the public discussion associated with criminal networks, also loaded on this factor, although somewhat weaker than on the variable ethnic groups. The last factor loaded on two groups only; people with high income and right-wingers. We labelled that group *privileged groups*.

4.4. Emotion Processes and Out-Group Attitudes

We initiated our research into the substantive questions by mapping associations between habitual emotion regulation and out-group attitudes

(**Study II**). We found that habitual expressive suppression was associated with decreased acceptance toward out-groups. On the other hand, cognitive reappraisal was not associated with increased acceptance. We also performed some exploratory analyses and found that individuals with more habitual cognitive reappraisal in relation to expressive suppression had a higher acceptance of out-groups.

Next, we proceeded to investigate causal effects of emotion regulation interventions on emotions and out-group attitudes after exposure to threatening news material. In **Study III**, participants who received no instructions to regulate their emotions when reading upsetting news articles had significantly higher levels of anger than those who cognitively reappraised their emotions (Figure 2). Similar results were found for disgust between the reappraisal and control group, but the association did not reach significance after a Bonferroni-correction, despite a small to low medium effect size. There were no differences among the groups in other negative emotions.

The results for the suppression group were similar. Suppressing emotion expression resulted in lower anger and disgust compared to the control group, but the difference was not statistically significant, and the effect size was small. For the non-verbal scale (SAM), there were no group differences.

When investigating the effect of emotion regulation strategies on subsequent out-group attitudes we found, contrary to our expectations, that both cognitive reappraisal and expressive suppression increased immediate acceptance of target out-groups, compared to the control condition (Figure 3). The main effect was not moderated by self-identification. We also found that the effect of the manipulation also transferred to non-targeted outgroups. There was also some support for an indirect effect on acceptance of target out-groups, mediated via disgust, for reappraisal in relation to the control group.

Next, we investigated whether the acceptance of target out-groups was in addition to the experimental condition predicted by habitual emotion regulation (cognitive reappraisal, expressive suppression and emotion dysregulation), and political inclination. We did not find support for that those factors alone, or in interaction with the experimental condition, moderated the effect of the experimental condition on the acceptance of target out-groups. Neither political ideology moderated the effect.

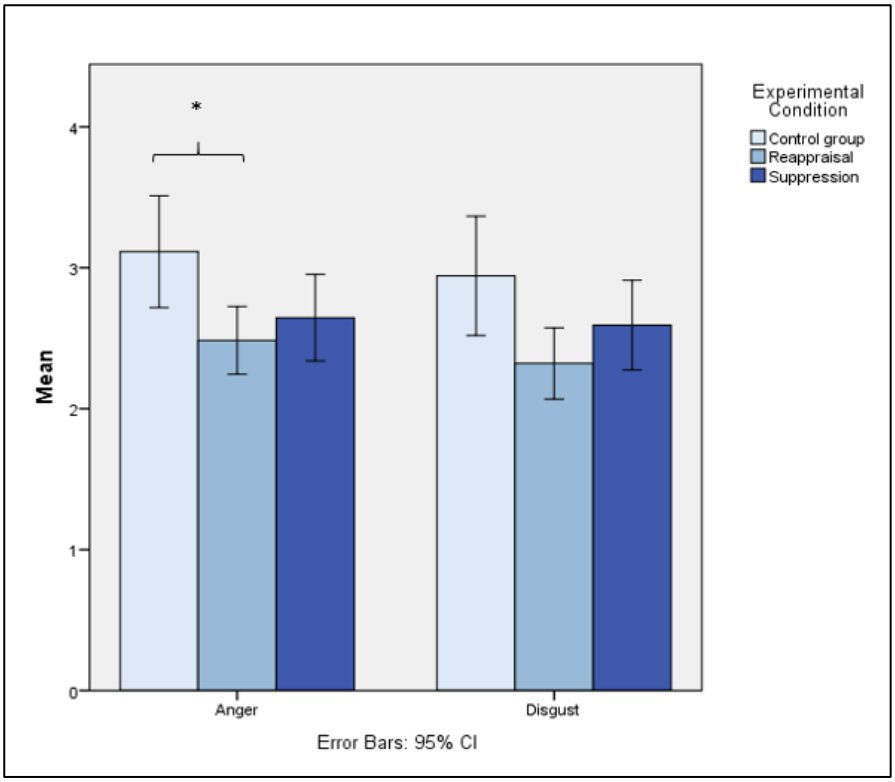

Figure 2. The results from Study III, showing the effect of experimental condition (cognitive reappraisal, expressive suppression or control condition) on aversive emotions after exposure to threatening news material about out-groups. * $p < .05$.

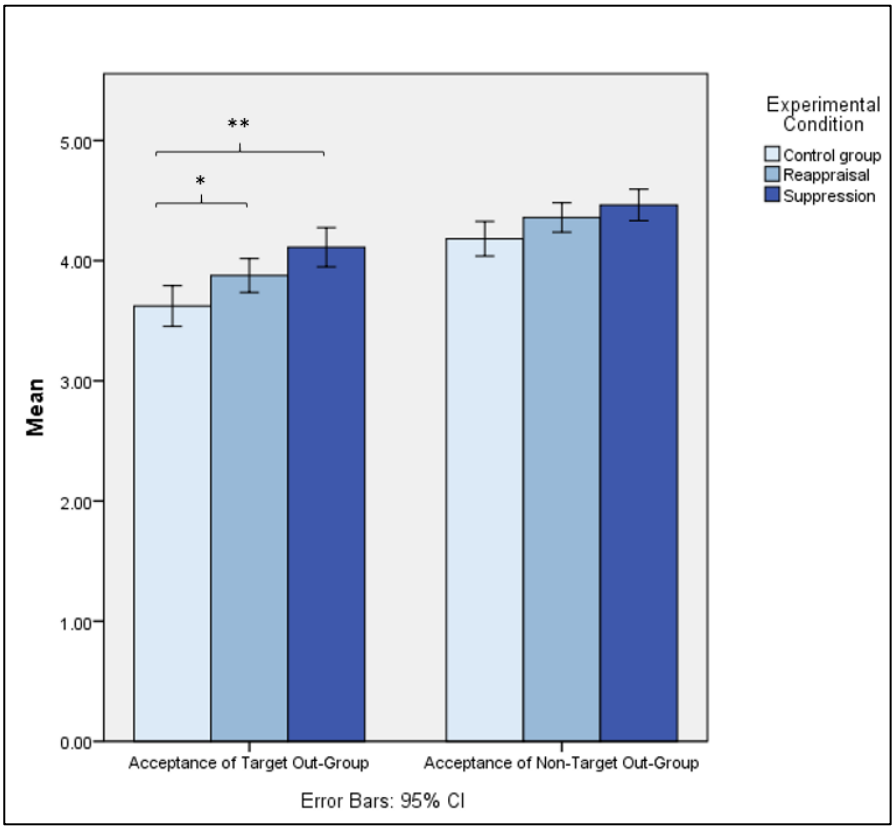

Figure 3. The results from Study III, showing the effect of experimental condition (cognitive reappraisal, expressive suppression or control condition) on out-group acceptance after exposure to threatening news material about out-groups. * $p < .05$, ** $p < .001$.

Study III raised some new questions, so we proceeded to conduct a similar experiment to complete the results we obtained in the previous study. This time, we used news material related to a real terror attack, which we hypothesized could have a greater emotional impact than the material used in **Study III**. In **Study IV**, the experimental condition affected the emotional reactions, with cognitive reappraisal significantly decreasing negative emotions, and mindful attention increasing them (Figure 4). We also found that adverse emotions directly negatively predicted the acceptance toward attack-associated groups, but not toward other groups. On the other hand, the out-group attitudes were not directly affected by the experimental condition (Figure 5). In the reappraisal and mindful attention conditions, we found an indirect effect on out-group attitudes via negative emotions. We found no indirect effect of

experimental conditions on the acceptance of out-groups, mediated via both negative emotions and posttraumatic symptoms. The relationship between the mindful attention condition and the acceptance of attack-associated out-groups was positively moderated by habitual expressive suppression.

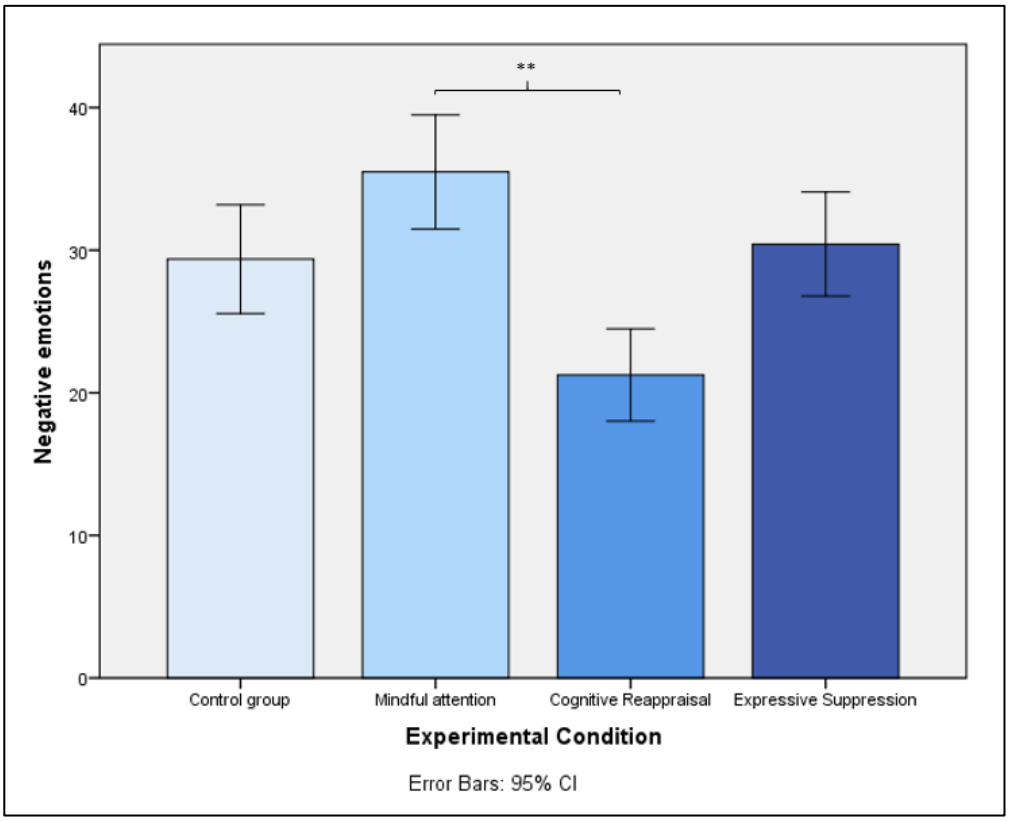

Figure 4. The results from Study IV, showing the effect of experimental condition (cognitive reappraisal, expressive suppression, mindful attention or control condition) on aversive emotions after exposure to news material reminding of a real terror attack. ** $p < .001$.

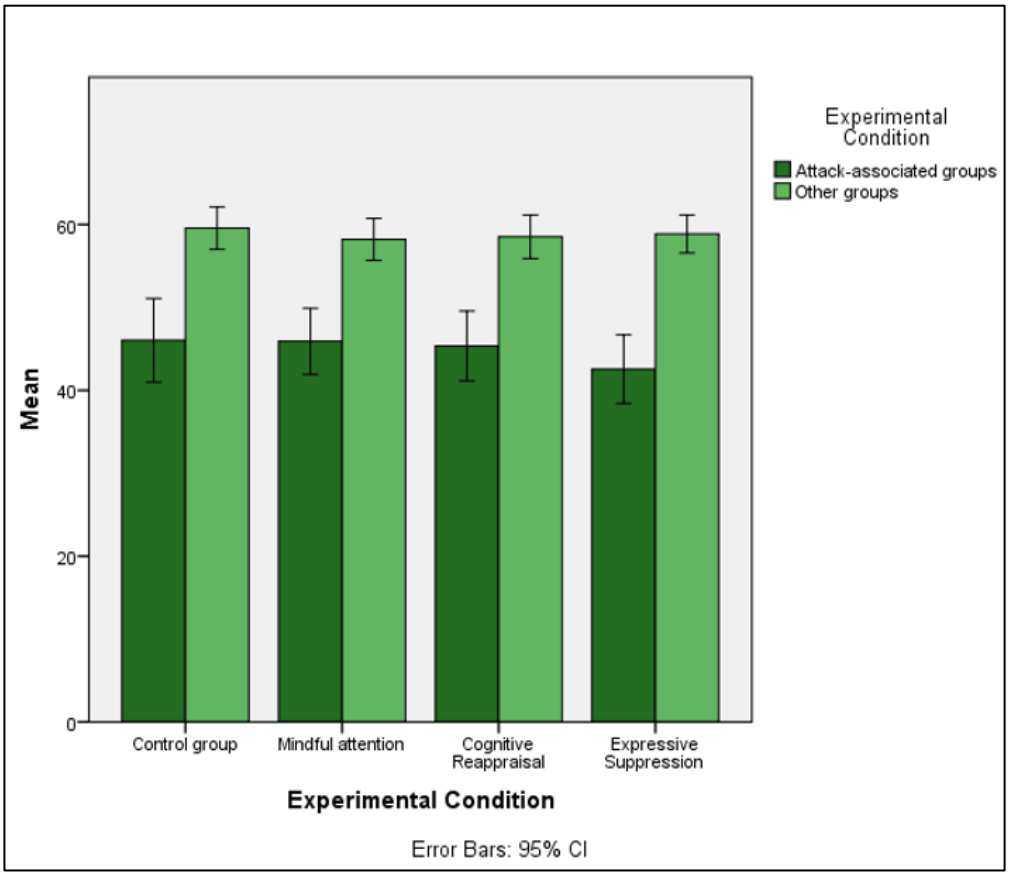

Figure 5. The results from Study IV, showing the effect of experimental condition (cognitive reappraisal, expressive suppression, mindful attention or control condition) on out-group acceptance after exposure to news material reminding of a real terror attack.

4.5. Habitual Emotion Regulation and the Susceptibility to PTSD after Out-Group Threat

We investigated the relationship between habitual emotion regulation and the amount of PTSD symptoms after the terror attack in Turku. We found that habitual cognitive reappraisal correlated to a small degree with PTSD symptoms. Expressive suppression, on the other hand, had no relationship with PTSD symptoms. Emotion dysregulation again was associated with PTSD to a small degree. Relating to emotion regulation, PTSD symptoms also correlated significantly with the degree of negative emotions both before and after the threatening stimuli

reminding of the terror attack (a small and moderate correlation, respectively). As for the association between posttraumatic stress and out-group attitudes, PTSD symptoms correlated negatively with acceptance of attack-associated groups, but not other groups.

4.6. Proximity to the Threat and Posttraumatic Symptoms

The PTSD symptoms were also related to the physical distance to the attack site so that participants who had been closer to the attack site reported somewhat more PTSD symptoms. Relatedly, participants from Turku reported moderately more PTSD symptoms than participants from Tampere, where no attack took place. Psychological proximity to the event was also positively correlated with PTSD symptoms and negative emotions after the stimuli, but not before.

5. Discussion

The present thesis builds on previous literature showing the role emotions play in intergroup attitudes. The general question we investigated was whether the regulation of the preceding and associated emotions influences the intergroup attitudes. We found support for that habitual emotion regulation styles and related variables are associated with intergroup attitudes in the hypothesized direction. In addition, we found support for even brief emotion regulation interventions modifying intergroup attitudes, especially in relatively normative situations. For situations involving stronger threats, however, other types of intervention may be needed. Further, we found novel indications for posttraumatic stress moderating the emotion regulation process after a real intergroup threat as well as the attitudes to outgroups perceived associated with the threat.

5.1. Habitual Emotion Regulation

In Finland, through the influence of the ascetic protestant culture, open emotion expression is discouraged and emotion control is normative (Pantti, 2005). Our results on the prevalence of different habitual emotion regulation styles indicate that the participants from the investigated population tend to use cognitive reappraisal to a larger degree than expressive suppression. At a first glance, the Finnish cultural influences on emotion expression would be expected to result in a higher degree of expressive suppression. However, even cognitive reappraisal may reflect the normative emotion expression. It is plausible that cultural influences increase the likelihood of automatic inhibition of contextually unacceptable or aversive emotions—a process comparable to BIS processes in the theories of threat and defense (see section 1.4). If the inhibitory process operates at an automatic, implicit level, the individual may not detect it consciously. The inhibition then provides an opportunity to cognitively reappraise the situation, downregulate the emotion and express it in a more socially acceptable way.

As for relationships between the different forms of habitual emotion regulation, we also found that habitual expressive suppression tended to correlate positively with emotion dysregulation. This reflects prior studies

indicating that expressive suppression generally is a dysfunctional emotion regulation strategy (Aldao et al., 2010).

5.1.1. Associations between Education and Habitual Emotion Regulation

Given that cognitive reappraisal may require cognitive resources (Sheppes & Meiran, 2008) and our outcome variable, overt prejudice, is generally negatively associated with education (Carvacho et al., 2013), we tested whether the effects of emotion regulation on out-group attitudes were in fact, explained through the level of education. The meta-analysis on our results across the studies showed that there was no association between the level of education and the habitual use of cognitive reappraisal. Likewise, habitual expressive suppression was not associated with the level of education. On the other hand, emotion dysregulation was negatively associated with education level, showing a small effect size. This reflects findings presented by Gumora and Arsenio (2002) showing that emotion dysregulation was independently related to poorer academic performance in young adolescents, even after controlling for other cognitive variables. To illustrate, an individual with emotion dysregulation characteristics such as impulsivity may find it more challenging to attend to teaching, to have positive experiences with teachers and therefore have a lower likelihood of pursuing continued education.

Another possibility is that the effects of emotion regulation would operate through intelligence rather than education. As we did not include measures of IQ in our studies, we could not test for this possibility. However, previous studies have shown that ERQ-cognitive reappraisal (Drabant, Mcrae, Manuck, Hariri, & Gross, 2009) together with ERQ-expressive suppression (Gross & John, 2003) are unrelated to IQ. Further, Farrelly and Austin (2007) found that management of emotions, a construct related to emotion regulation, was unrelated to cognitive ability. On the other hand, Schmeichel, Volokhov, and Demaree (2008) found that higher working memory capacity was related to better suppression of emotion expression as well as better detached appraisal of emotional stimuli. McRae, Jacobs, Ray, John, and Gross (2012) found that reappraisal ability was associated with working memory capacity and set-shifting costs. In sum, the relationship between emotion regulation abilities and cognitive capacity still requires further research. However, given the existing

literature, it seems unlikely that the emotion regulation measures used in the current work largely overlap with education or intelligence related measures.

5.1.2. Associations between Gender and Habitual Emotion Regulation

Earlier literature has frequently reported gender differences in emotion regulation styles. For emotion dysregulation, gender differences have been reported in some of its areas (e.g. Gratz & Roemer, 2004; Miguel, et al., 2017; Mitsopoulou, Kafetsios, Karademas, Papastefanakis, & Simos, 2013; Neumann, van Lier, Gratz, & Koot, 2010, but see also Giromini, Velotti, De Campora, Bonalume, & Cesare Zavattini, 2012). Across our population-based samples, there was a small gender difference in the emotion dysregulation characteristics so that women exhibited somewhat more emotion dysregulation than men.

When it comes to other emotion regulation styles, earlier studies indicate that men tend to use more expressive suppression than women, and that there are no gender differences in the use of cognitive reappraisal (Cabello, Salguero, Fernández-Berrocal, & Gross, 2013; Gross & John, 2003; Haga, Kraft, & Corby, 2009; Kwon, Yoon, Joormann, & Kwon, 2013; Rogier, Garofalo, & Velotti, 2017; but see also Nolen-Hoeksema & Aldao, 2011). In a review by Tamres, Janicki, and Helgeson (2002), women engaged more in positive reappraisal than men. Rogier, Garofalo, and Velotti (2017) also found women to use cognitive reappraisal more than men. Our aggregated results showed that women used cognitive reappraisal more than men, and men used expressive suppression to a larger degree than women. The results may reflect biological propensities, but also the different socialization experiences, which reinforce pro-sociality in girls to a somewhat larger degree than in boys (Hastings, Utendale & Sullivan, 2007). The gendered socialization and results concerning expressive suppression are discussed below.

5.2. Masculinity and Emotion Regulation

Our consistent results regarding men's larger use of expressive suppression likely reflects previous literature concerning masculinity and emotion processes. With the term masculinity we refer to a set of socially

defined characteristics that men are socialized to (Mahalik, Locke, et al., 2003), although it is important to acknowledge that masculinity is not a static phenomenon, but a dynamic, culturally shaped process that varies across context and time, relative to femininity (Connell, 2005). Berke, Reidy and Zeichner (2018) reviewed the existing literature and concluded that boys and girls seem to generally experience different socialization of emotion. Parents (and later, peers) generally reinforce different emotional expressions in boys and girls; boys for example tend to receive messages discouraging the display of vulnerable emotions (Berke, Reidy & Zeichner, 2018). Even though the within-group variation in socialization is likely to be large (Jakupcak, Salters, Gratz, & Roemer, 2003) and childhood socialization of emotion should not be viewed deterministically, the experiences likely shape a framework that men build gendered self-schemas on, including cognitions as well as descriptive and prescriptive norms about masculinity (Berke, Reidy & Zeichner, 2018). These include norms relating to emotion regulation and expression, which commonly posit that men should control, restrict and suppress emotions apart from anger (Chaplin, Cole, & Zahn-Waxler, 2005). Nevertheless, several other factors such as physiological gender differences may also influence emotion processes (Levant, Hall, Williams & Hasan, 2009).

In a study by Jakupcak et al. (2003), masculine ideology was positively associated with men's global fear of emotions. It also had a negative association with affect intensity, and more specifically, negative reactivity. Timmers, Fischer, and Manstead (1998) reported results indicating that men tend to control their emotions and express feelings that reflect power. Berke, Reidy and Zeichner (2018) suggest that as self-perceived threats to masculinity give rise to vulnerable emotions such as fear and shame (which themselves differ from gendered emotion norms), fear of emotion may arise as a conditioned response. This again may lead men to employ emotion regulation strategies such as suppression, denial and avoidance (Berke, Reidy & Zeichner, 2018). Relatedly, Levant, Hall, Williams and Hasan (2009) found in their meta-analysis that men are more likely than women to exhibit alexithymia. This may imply that men may not only show less effective emotion regulation, but also report fewer emotions and report them more erroneously since their emotional awareness is generally lower.

Viewed from an evolutionary perspective, men's suppression of vulnerable emotions may partly play a role in establishing domination in

relation to outgroup men within intrasexual competition for mates. As suggested by Navarrete et al. (2010), there are likely evolved psychological mechanisms in men motivating aggression and dominance toward other social groups. Men have indeed been shown to exhibit greater social dominance than women (Pratto, Liu, Sidanius, & Levin, 2000; Sidanius, Pratto, & Brief, 1995; but see also Schmitt & Wirth, 2009). Suppressing the expression of vulnerable emotions may be one facet of maintaining a strong and dominant position (Kaufman, 1999; Mahalik, Good, & Englar-Carlson, 2003).

5.3. Attitudes toward Out-Groups

As Cottrell and Neuberg (2005) discuss, it is probable that individuals have evolved mechanisms to detect threats against the functioning and ultimately the survival of the in-group, which in turn benefits the fitness of the individual. Across our **Studies II-IV**, we found some clear patterns relating to out-group attitudes. Groups from ethnic backgrounds other than the majority of Finns as well as groups associated with crime were the least accepted. This is in line with the results from a meta-analysis and review about different kinds of out-group threat by Riek, Mania, and Gaertner (2006), which indicated that out-group attitudes are affected by perceived threats from the part of an out-group. Based on the threats discussed by Riek et al. (2006), our results indicate that symbolic and realistic threats are likely those that result in strongest negative attitudes among the studied population. In addition, negative stereotypes of those groups and intergroup anxiety (i.e. a fear for being exploited, embarrassed, rejected or ridiculed in the intergroup interaction; Stephan et al., 1999) can further affect our attitudinal results. The least accepted out-groups in our studies likely consist in a greater perceived symbolic and realistic threat, and the most accepted out-groups likely consist in lesser perceived threat. The out-groups who were most accepted were similar in all studies (**II-IV**); elderly, Sami people, housewives, persons with physical disability, gay persons and Finland-Swedes (**Studies II-III**), and elderly, gay persons and Finland-Swedes (**Study IV**). The elderly, Sami people, housewives and persons with physical disability may not be seen as being a threat for one's in-group's political and material power, and wellbeing. Taken together, our results partly reflect the results reported by Cottrell and Neuberg (2005) where the emotions elicited by different outgroups

were related to the perceived amount and type of threat from that group, although these differences were not seen in their prejudice scores.

5.4. The Role of Emotions and Emotion Regulation on Attitudinal Reactions to Out-Group Threat

Before conducting experimental studies, we wanted to assess whether the correlational relationship between habitual cognitive reappraisal and expressive suppression supported our predictions. In **Study II**, we found that habitual expressive suppression was associated with decreased acceptance of different out-groups. To our knowledge, similar results have not been reported previously. We propose that the mechanism behind the association between expressive suppression and negative out-group attitudes relates to experiential avoidance, and further, psychological inflexibility. Experiential avoidance is closely related to expressive suppression and implies an unwillingness to experience unpleasant emotions, thoughts, bodily sensations and behavioral predispositions (Hayes, Wilson, Gifford, Follette & Strohsal, 1996). Further, experiential avoidance is a component of a larger construct, psychological inflexibility, which refers to behavior that is rigidly steered by thoughts, feelings and urges instead of by what would be more effective or meaningful in each situation. Psychological inflexibility predicts generalized prejudice and possibly a greater likelihood of acting on the prejudiced beliefs (Levin, Luoma, Vilardaga, Lillis, Nobles & Hayes, 2016).

Contrary to our expectations, habitual cognitive reappraisal was not associated with the acceptance of out-groups. This result differs from previous reports, of which many are conducted within the Israel-Palestine conflict (e.g. Halperin & Gross, 2011; Halperin, Pliskin, Saguy, Liberman, & Gross, 2014; Halperin, Porat, Tamir, & Gross, 2013). This may reflect social and cultural differences between the Finnish and the Israeli-Palestinian context. For example, the absence of an overt, intractable conflict is a plausible explanation. It may be that cognitive reappraisal has a larger influence in settings where intergroup emotions and attitudes are more polarized. Another possible explanation for cognitive reappraisal not being associated with out-group acceptance could be that since the Finnish culture encourages moderate and cautious emotion expression, there might be a stronger socialization toward cognitive reappraisal strategies in emotion regulation. Habitual cognitive reappraisal may hence be more

universally prevalent and normative in the Finnish setting. An indication of this comes from comparing the mean scores of cognitive reappraisal between our study and a study conducted in the Israeli-Palestine context; 3.24 (Halperin & Gross, 2011) versus 4.43 (**Study II**). This, however, needs to be investigated and replicated in cross-cultural studies on emotion regulation styles. Another aspect worth noting is that all individuals may not be able to apply cognitive reappraisal successfully (Ford & Troy, 2019). Further, it is possible that the frequent use of expressive suppression with its negative consequences (including negative out-group attitudes) is limited to a smaller, homogenous group in the society. To deepen our understanding in this area, a suggestion for future studies is to investigate the socialization of emotion expression in different groups in the Finnish society.

Moreover, our results preliminarily suggested that a greater level of habitual cognitive reappraisal (relative to habitual expressive suppression) was positively associated with higher acceptance of certain out-groups. Although a novel finding, this does reflect previous research where greater acceptance toward minorities has been associated with cognitive reappraisal. Provided that our assumption about cognitive reappraisal being relatively normative in Finland is empirically supported, it may be that the positive relationship between cognitive reappraisal and acceptance toward out-groups emerges in the Finnish context only when cognitive reappraisal is markedly higher than the mean level of cognitive reappraisal. This possibility should, however, also be investigated by future studies.

In our experimental **Study III**, we presented participants with threatening news articles and instructed them to read them while regulating their emotions using cognitive reappraisal, expressive suppression or no instructed strategy. There were differences among the experimental conditions in the levels of negative emotions elicited by the stimulus material, but only the difference in anger between the cognitive reappraisal (less anger) and control conditions (more anger) reached statistical significance after controlling for multiple testing. The difference in disgust had a similar effect size but was only nearly statistically significant. Our results also indicated that for the reappraisal group in relation to the control condition, the attitudes toward target out-groups were mediated via disgust so that a higher level of disgust decreased the acceptance for participants in the reappraisal group. This result is in line

with prior research highlighting the unique role of disgust in out-group attitudes (e.g. Inbar, Pizarro, & Bloom, 2012; Katzir & Liberman, 2019; Matsumoto, Hwang, & Frank, 2017; see section 1.5 in this thesis summary).

Further, we found that both cognitive reappraisal and expressive suppression increased immediate acceptance of target out-groups, compared to the control condition. This result, and the results regarding the differences in negative emotions, is notable, given that the emotion regulation instruction was brief and was not preceded by training in the given emotion regulation strategy. It is hence likely, that with more long-term training in emotion regulation strategies the results would have been more robust. A possible explanation for the lack of difference between the cognitive reappraisal and expressive suppression conditions in out-group attitudes is that merely attending and focusing on emotional reactions serves as a regulator, compared to a condition where no such instructions are given. This could also apply for the results concerning the negative emotions; ultimately, it may be a question about attention to emotion. Actively attending to one's emotion processes compared to not attending could in certain situations suffice in decreasing negative emotions. Such attentional processes are involved in emotion regulation processes consisting of mindful attention and acceptance (see **Study IV**).

Another possibility to the lack of difference between cognitive reappraisal and expressive suppression conditions should be mentioned. The delay between the threatening material may have been too short for the distal defenses to emerge as outlined in theories of threat and defense (e.g. Jonas et al., 2014; Tritt, Inzlicht, & Harmon-Jones, 2012). It can be that proximal defenses were still activated among the participants, leading to suppressed aversive arousal, and that distal defenses (which include increased worldview defense, adherence to one's in-group and distancing from out-groups) were not activated yet. To account for this possibility, in **Study IV** we increased the delay between the stimulus material (threatening news material about a terror attack) and the attitudinal measures. In this study (**Study IV**), the experimental condition did affect the emotional reactions. As expected, the cognitive reappraisal condition experienced the lowest amount of negative emotions. Contrary to our expectations, however, the mindful attention condition reported the highest amount of negative emotions among all conditions. The negative and distressing nature of the stimulus material is a likely explanation for the high scores of negative emotions among the mindful attention group,

since this condition was instructed to attend to and accept all internal experiences. It may be that the beneficial and anxiety reducing effects of mindfulness are reached after a longer training period. The results also highlight the importance of acknowledging the possibility of adverse reactions in future studies involving mindful attention intervention in novice practitioners.

In **Study IV**, we further found that negative emotions had a negative association with the acceptance of attack-associated out-groups, but not other groups. Although we found significant differences in emotions among experimental conditions, and mediating effects via negative emotions, the out-group attitudes were not directly affected by the experimental condition. Indirectly, however, in the reappraisal and mindful attention conditions the out-group attitudes were affected via negative emotions. It may be that this time the delay was too long and the emotional impact on the attitudes was neutralized before the participants completed the attitudinal measure, or that the emotional impact was not large enough to modify the out-group attitudes. Another possibility, however, relates to the stimulus material used. We used news material about the first ever recorded Islamist terror attack in Finland. The attack was the major headline in most newspapers the days after the attack, and related Internet searches (e.g. "Turku" and the Finnish words for "stabbing", "terrorism", "attack") peaked on the day of the attack and a few days after. During the first days of the trial in April 2018, and during the verdict in June 2018, there were again increased searches with terms such as "Turku stabbing" (Google Trends, 2019). The abundant media exposure is likely to have affected much of the population to equal degrees and the attitudes toward groups perceived to be associated with the perpetrator may have been established relatively strongly already before the study. This possibility echoes earlier literature; Wohl, Porat, and Halperin (2016) tested in a study within the Palestinian-Israeli conflict whether an external incentive for negotiating peace (i.e., lowered intergroup threat) would lead to greater open-mindedness toward new information about the antagonist group. This hypothesis was supported among individuals who exhibited low collective angst (an emotional reaction when perceiving the in-group's future to be jeopardized; Wohl, Branscombe, & Reysen, 2010). However, the results did not replicate in a period when the socio-political climate was tense and intergroup threat was high; on all levels of collective angst, the cognitive freezing was unaffected. This adds to the notion that when the intergroup threat level is

high, emotion regulation interventions may not be effective (Wohl & Tabri, 2016). It is possible that the same phenomenon was witnessed in our **Study IV,** where the level of intergroup threat in the stimulus material was arguably higher than in **Study III.** Similarly, these results relate to the findings indicating that individuals with more PTSD symptoms exhibited more emotion dysregulation and more negative attitudes toward out-groups after exposure to threatening material. It is possible that for these participants, due to existing posttraumatic stress with heightened arousal and vigilance, the stimulus material was perceived as more threatening. It is plausible that these participants could not downregulate the negative emotions resulting from the stimulus material, due to the impact of the threat, the increased emotion dysregulation characteristics related to PTSD, or a combination of both.

Another related aspect is that the trial against the perpetrator was held during the data collection, which may have further affected the attitudes. Hence, it may be that contexts with intergroup threats of greater magnitude require more thorough and intensive, or other types of intervention than a brief emotion regulation intervention. Further, this conclusion also raises the question about when it is preferable to downregulate the negative emotional responses to threat and when resources would be better used to prevent the intergroup threat itself. Especially concerning severe threats such as terror attacks that are direct threats to life and health, it is easy to argue that prevention should be prioritized. Concerning less threatening situations, however, it is challenging to establish objective thresholds since the experience of threat is largely based on subjective interpretations. Nevertheless, an approximate guideline could be based on the definition for traumatic event as outlined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; APA, 2013).

5.5. The Role of Posttraumatic Stress on Emotional and Attitudinal Reactions after Serious Out-Group Threat

Terror attacks are associated with increased levels of PTSD in the affected population (Galea et al., 2002). In our **Study V**, PTSD symptoms were negatively associated with acceptance of attack-associated groups, but not other groups. This result indicates that participants with higher

level of traumatic stress after the incident may feel particularly aversive toward objects and persons reminding of the traumatic event.

We found that habitual cognitive reappraisal, but not expressive suppression, correlated with PTSD symptoms. This finding differs from previous reports (Boden et al., 2013) where expressive suppression has been found to be associated with increased PTSD severity and cognitive reappraisal with decreased severity. A possibility here is that the association between cognitive reappraisal and PTSD is explained by gender, given that women are more vulnerable to PTSD (Gavranidou & Rosner, 2003) and use more cognitive reappraisal (see section 4.4.1). We tested this possibility for this thesis summary but found no support for it.

Other possibilities explaining our results could be that the association between PTSD symptoms and cognitive reappraisal reflects rumination, which is a typical feature of PTSD (Michael, Halligan, Clark, & Ehlers, 2007). Perhaps individuals with notable PTSD symptoms experience difficulties suppressing the distressing emotions and cognitions? These possibilities warrant more research.

Emotion dysregulation was also associated with PTSD symptoms. PTSD symptoms also correlated significantly with the amount of negative emotions both before and after the threatening stimulus material. The PTSD measure also correlated negatively with the acceptance of attack-associated groups, but not other groups. This may indicate the negative effect PTSD symptoms may have on emotion regulatory processes. For example, PTSD may cause hypervigilance, anxious arousal and affect interpretations of events and situations negatively (Foa & Rothbaum, 1998). It can be that individuals with greater amount of PTSD symptoms have more difficulties downregulating the negative emotions (and cognitions) about reminders of distressing events. This is an aspect worth considering in future research about out-group attitudes, especially in contexts involving intergroup violence, like terrorism.

Of note, the PTSD score was collected retrospectively, by asking the participants to remember the symptoms they experienced during 14 days after the attack. A possibility is that the retrospective reports are affected by emotion dysregulation characteristics. An individual with more functional emotion regulation skills may have recovered more quickly from the distressing event (Boden et al., 2013), and may hence remember less symptoms.

5.6. Methodological Aspects of Internet Surveys

All samples for the present thesis were drawn from the Population Registry Centre in Finland. Among other tasks, the Population Registry Center maintains the Population Information System, which is a computerized national register containing basic information about Finnish citizens and those residing permanently in Finland. The information in the register is used in a wide area of information management in the Finnish society, such as elections, taxation, public administration, statistics and research (Population Registry Centre, n.d.-a). By drawing samples from the Population Information System, we could hence target a representative, population-based selection of individuals in our recruitment. This differs from the majority of internet-based studies, which do not reach samples that are representative to the same degree. Our samples were not drawn among those individuals who have forbidden disclosure of personal information (Population Registry Centre, n.d.-b), currently about 420.000 individuals in the registry (A. Oksanen, personal communication, March 20, 2019).

There are some disadvantages with web surveys. Some major issues relate to internet coverage, sampling and non-response (de Leeuw, 2012). Problems relating to coverage implies that certain groups may be not have access to internet and hence be under-represented in the sample, leading to estimation errors (Bethlehem, 2010; de Leeuw, 2012). However, internet is widely available in Finland. In a recent survey, 93-100% of the age groups targeted in the present studies (18-64-year olds) reported using the internet during the last three months (Official Statistics of Finland, 2018b). In addition, we could decrease the risk of an unrepresentative sample by using the population registry data for recruitment.

Another common problem for internet surveys concerns non-response. Web-based surveys typically reach lower response rates than mail-based surveys (Shih & Fan, 2008), although other previous reports have found the response rates in traditional surveys compared to online surveys to be similar (Bälter, Bälter, Fondell, & Lagerros, 2005). This was also noted in our studies, where the response rates were low. Some previous reports have discussed the reasons for the lower response rate for internet surveys. As suggested by Sánchez-Fernández, Muñoz-Leiva, and Montoro-Ríos (2012), this may be due to lowered perceived novelty of the web survey, spamming and excessive number of internet surveys. Millar and Dillman (2011) conducted a study about improving response rates in

web surveys and in combined web and mail surveys. They found for example that incentives and augmenting the original mail contact with e-mail contacts increased the response rate for web surveys. For our studies, however, it was not possible to implement the e-mail augmentation since Population Registry Center does not provide individual e-mail addresses. We chose to recruit participants using a printed invitation card, because this allowed us to reach out to more individuals. An alternative would have been to send invitation letters in envelopes. This option could have signaled higher importance and legitimacy (Millar & Dillman, 2011), and hence increased people's likelihood to respond. On the other hand, this more costly option would have reached fewer people.

When it comes to retention rate, it could be noted that many participants entered the survey site and only completed the survey partially or not at all. Retrospectively, we could have employed measures to prevent a large number of participants who discontinued. For example, Sánchez-Fernández et al. (2012) found that retention and completion rates for web surveys could be improved for example by personalizing invitations with greeting the recipient by name.

5.7. Limitations

A challenge for emotion research is that there is no objective, external means to measure subjective, internal experience of emotions (Barrett, 2004). Emotion experience cannot be explained, for example, merely with neurobiological features since all conscious events also have phenomenological elements (Barrett, Mesquita, Ochsner, & Gross, 2006). One of the major limitations in our studies is hence that all emotions and trait emotion regulation are measured with self-report. As Barrett (2004) discusses, an important question concerning self-reports of emotion is whether those measures capture actual affective changes or whether they only reflect people's different understandings of emotion words. She investigated this question in three studies, concluding that how the participants reported their feelings was not only based on their understanding about the emotion words, but on properties of those emotions (Barrett, 2004). Relating to theories of threat and defense, BIS-activated states of negative affect are challenging to measure with self-report measures. However, there is increasing neural data of BIS-related negative affective states (Jonas et al., 2014). Further, among youth, the

original DERS correlates significantly with a physiological marker of emotion dysregulation (Vasilev, Crowell, Beauchaine, Mead, & Gatzke-Kopp, 2009).

Relating to the response format, certain limits also apply to the concept and measure of the main outcome, out-group attitudes. In the current studies, we measured the outcome variable on a valence scale from negative to positive. As discussed early on (e.g. Thurstone, 1928), this, however, may have problematic aspects, given for example that positive and negative attitudes are not necessarily optimally conceptualized along a dichotomous continuum (Cacioppo & Berntson, 1994). First, although attitudes can predict behavior fairly well (for a meta-analysis, see Glasman & Albarracín, 2006), a valence scale does not capture the nuances, for example, of how an individual thinks about or behaves toward an out-group. Valences merely reflect the nature (positive or negative) of an individual's evaluation of an object, as well as possibly the level of arousal especially concerning strongly involving topics (Albarracín, Sunderrajan, Lohmann, Chan & Jiang, 2019). Therefore, a bipolar measure may be insufficient and could not capture with further dimensions. On the other hand, the basic bipolar evaluative process is of great evolutionary importance, for example, to distinguish threatening from non-threatening stimuli.

We used a between groups design in our studies, which may be problematic given the participants' differing frames of reference when it comes to the emotion scales (Rooney, Benson & Hennessy, 2012). Individuals are likely to vary considerably in their ability to identify emotions and emotion processes. This may particularly be the case with individuals with more emotion dysregulation tendencies. In a similar vein, recognizing one's habitual emotion regulation strategies requires introspective abilities. It can be that, compared with individuals with functional habitual emotion regulation, those with more dysfunctional habitual emotion regulation experience more difficulties in recognizing and reporting their emotion processes.

The data-collection method of our studies is also related to certain limitations. Since our studies were conducted online, we could not exert control over how the participants internalized and applied the emotion regulation instructions. To increase the likelihood of participants reading and adhering to the instructions in both experimental studies we employed items to verify that the participants had read and understood the

instructions. We also showed the participants reminders of the instructions between the stimulus materials.

There is also a notion concerning the stimulus material. Since media tends to offer more stereotypical, negative views about ethnic minorities than representatives of the White majority (e.g. Tukachinsky, Mastro, & Yarchi, 2015), the threat perception in the studies using news material as stimulus material may have been influenced by previous negative portrayals of certain groups in the media (Atwell Seate et al., 2018).

Our outcome measure also warrants some discussion. The mere act of differentiating between groups can prompt intergroup hostility (Hainmueller & Hopkins, 2014). Further, assessments about attitudes that are contrary to the existing norms (like racism) are likely to be affected by social desirability bias (Krumpal, 2013). This is especially likely with the kind of measures used in the present studies where participants are requested to record their attitudes to different out-groups using a scale. On the other hand, the social desirability bias may be decreased somewhat by assessing many different out-groups, since the participants will likely record the scores for each out-group in relation to the other groups. In **Study II**, to protect against social desirability bias, we employed a forced choice test to compare its results to the self-reported acceptance scores. The results from the forced choice test were similar to the results from the self-reported scores.

The results from **Studies III** and **IV** did not align as we had expected. It is our wish that future studies will replicate the present studies and shed light on the remaining questions concerning emotion regulation strategies and out-group attitudes. A possibility for us would have been to conduct several separate studies with a similar set-up to assess the replicability of our results. However, we chose to conduct fewer studies with larger samples to reach higher statistical power and higher confidence in our statistical results.

5.8. Practical Implications and Future Research Questions

The results of the present studies can be applied both in preventive and clinical measures. For example, the results can be used together with other interventions for programs aiming at improving intergroup attitudes or preventing negative intergroup attitudes from forming. Such initiatives

may be of interest for example for actors working in multicultural settings (e.g. global businesses, UN agencies, non-governmental organizations and humanitarian organizations). As suggested by Halperin, Sharvit, and Gross (2011), interventions targeting emotion processes and emotion regulation in particular have the potential to play an important role also in peace processes for example in conflict settings. For example, Halperin, Russell, Dweck, and Gross (2011) suggested *prospective emotion regulation* as an intervention to reduce the level of hatred before conflict-related events as a way to modify the behavioral responses to the event.

Another interesting question concerns the application of our results in media. In **Studies III** and **IV** we used real, threatening news articles as stimulus material. Since intergroup threat increases negative out-group attitudes, the strength of the perceived threat could be modified by varying how the message is portrayed. A suggested future study is to expose the participants to threatening news articles and compare the effects between cognitive reappraisal employed by the reader versus cognitive reappraisal incorporated directly in the text.

Further on a societal scale, measures for preventing negative intergroup attitudes are of importance even in normative contexts for example given the increased multiculturalism in Europe due to a rise in immigration (Eurostat, 2018) and forcible displacements (UNHCR, 2018). A candidate context for such interventions is the educational sector. Given that emotion regulation skills have far reaching effects on the wellbeing of the individual (apart from the effects on intergroup relations) (e.g. Gross & John, 2003; Haga et al., 2009; Mcrae et al., 2012), training in emotion and general mental health skills could be included in the local curricula in Finnish schools. The Finnish national-level core curriculum, that guides local curricula, lists aims for transversal competences. One of the aims is taking care of oneself and managing daily life, a field where mental health skills could be incorporated[1] (Finnish National Agency of Education, n.d.). In accordance with previous studies (Aldao & Nolen-Hoeksema, 2012;

[1] In Finland, the government sets up national objectives for basic and general upper secondary education, and decides which subjects are compulsory, and their time allocation. The national-level core curricula is managed by the Finnish National Agency for Education, who define its objectives and core contents. The local education providers establish local curricula based on the national-level core curricula and requirements, outlining how they will meet the nationally set objectives (Finnish National Agency of Education, n.d.).

Otterpohl, Schwinger, & Wild, 2016), the teaching should focus both on supporting the use of functional strategies and limiting the use of dysfunctional ones.

Another possibility for applying the present results in practice is within prisons, particularly in interventions with individuals who have engaged, or who are at risk to engage, in some type of intergroup aggression. Emotion regulation skills could be included in preventive and therapeutic programs aimed at these individuals, both in group interventions and individual interventions. The skills training should include metacognitive skills about emotion, emotion identification, as well as training in concrete emotion regulatory techniques. Importantly, as there are indications on that different emotion regulation strategies interact (Aldao & Nolen-Hoeksema, 2012; Otterpohl, Schwinger & Wild, 2016), such training should ideally target both functional and dysfunctional strategies, that is, to increase the use of functional and decrease the use of dysfunctional emotion regulation. Another important aspect to consider concerning practical applications as well as future research relates to balancing functional and dysfunctional downregulation of emotions. For example, since emotions guide our behavior, is all downregulation of all negative emotions beneficial? As discussed by Ford and Troy (2019), cognitive reappraisal of negative emotions may not always be beneficial since aversive emotions can have important functions. Indeed, occasionally an individual or out-group may pose a real threat, whereby downregulation of the negative feeling of threat would not be functional. For example, downplaying the reasons and consequences of a spouse's violent behavior may prevent an individual from leaving an abusive relationship (Arriaga, Capezza, Goodfriend, & Allsop, 2018). Further, downregulating negative emotions originating from identity-based threats such as racial oppression may jeopardize the individual's sense of self over time, resulting in decreased psychological health (Ford & Troy, 2019; Perez & Soto, 2011). Taken together, there are numerous situations where a downregulation of negative emotions may not be functional and can have negative consequences both on an individual and social level. In addition, the individual and social impacts may interplay; in some occasions, the individual consequences may be beneficial and the social consequences negative, or vice versa. Further, the interpretation about the nature of the consequences is marked by subjectivity. The analysis on the effects of downregulation of negative emotions is vital, but multilayered and complex, sometimes even tapping into areas such as morality.

Apart from group interventions, emotion regulation skills training could also be implemented in individual interventions (e.g. psychotherapy), especially with individuals who have exhibited problematic attitudes and relations to out-groups. An interesting possibility involves exposure interventions. An earlier report has showed that imagining intergroup contact can change negative attitudes toward immigrant groups, some of whom were originally relatively negatively viewed (Brambilla, Ravenna, & Hewstone, 2012). Imagining intergroup contact can be viewed as a form of brief imaginary exposure. Imaginal exposure desensitizes and decreases the aversive emotions toward a certain object (here: an out-group) (Foa & Rothbaum, 1998). In Brambilla, Ravenna and Hewstone's study (2012), the imaginary intervention led to more positive attitudes toward discriminated groups. One could hypothesize that this happened at least partly through a reduction in negative emotions toward the out-group (through desensitization). Experimental results supporting this notion were presented by Hodson, Dube, and Choma (2015). They found that imagined contact with a person representing a derogated out-group weakened the link between intergroup disgust sensitivity and prejudice, compared to a control condition. Individuals who exhibited higher intergroup disgust sensitivity did not report higher prejudice given that they participated in the imagined contact conditions. This indicates that exposure-based interventions can lessen the ability of disgust sensitivity to produce prejudice, likely by reducing aversive emotions (Hodson et al., 2015, 2014).

To conclude the discussion about practical applications, prior to applying the interventions in practice, it is important to map the possible challenges this poses. As a first example, emotion regulation interventions in an intergroup context focus on social functioning and therefore differ from those in individual psychotherapeutic contexts, where the focus is predominantly on relieving individual suffering. Further, a realistic challenge especially concerning group interventions is that all group members may not have similar levels of motivation to undergo the intervention. In individual interventions lacking motivation can be addressed with less effort, but in group session this requires more resources. In addition, when the application is conducted in a school environment, it raises the question about who is the most appropriate facilitator when balancing costs, availability and expertise.

New research questions raised by the studies concern the temporal aspects between intergroup threat, the emotion regulation intervention and the attitudinal outcome. In **Study III**, we employed a shorter delay between the intervention and the attitudinal outcome measure. This delay was increased in **Study IV**, with effects on the attitudinal measure that differed from the **Study III**. Also the type of threat necessitates further research; in **Study III**, the threat employed was more impersonal (newspaper articles), whereas the stimulus material in **Study IV** likely had more of a personal impact (news material about the first ever recorded terror attack in Finland).

Of note, the effects of the emotion regulation strategies on negative out-group attitudes were small to medium sized. Further, in line with earlier research (Wohl et al., 2016) we found indications for that strong intergroup threat may limit the effect of emotion regulation interventions on intergroup attitudes. Future studies should assess, whether the emotion regulation interventions and their effects could be augmented and developed with additional components, especially in contexts of strong intergroup threat.

Lastly, as all psychological interventions, emotion regulation interventions may have unexpected negative consequences (Wohl & Tabri, 2016). It is hence important to investigate potential adverse effects of emotion regulation interventions, and the individual, social and situational factors that contraindicate emotion regulation interventions.

5.9. Conclusions

We set forth to study the emotional components of negative out-group attitudes, predominantly in situations involving a threat. Given the complexity of the topic, we cannot exhaustively explain how negative out-group attitudes arise. However, we have shown that habitual expressive suppression is negatively associated with out-group acceptance. Furthermore, we have shown that in peaceful settings, relatively simple modifications to intergroup emotions can influence out-group attitudes after less impactful threat, but after more severe types of threat, additional interventions may be needed. Additionally, we have developed the basic conceptual model by showing that certain related variables, such as posttraumatic stress, may moderate the effect of emotion regulation on emotions and outgroup attitudes.

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Appendix

Contextual information about the out-groups

In line with a previous study by Duckitt and Sibley (2007), the aim of the selection of the out-groups was to include the groups that frequently are met with prejudice in Finland (Korhonen, Jauhola, Oosi, & Huttunen, 2016; Ministry of the Interior, 2014). We also aimed to cover a broad range of groups to capture variation in prejudice scores, and to include groups consisting of different levels of threat. The religion- and worldview related groups consisted in Atheists, Christians, Muslims, and Jews, of which the three latter represent the largest groups of the world religions in Finland. A 33% of Finns report believing in God as per the Christian teachings (Ketola, Hytönen, Salminen, Sohlberg, & Sorsa, 2017) and, though not an indication of belief directly, 71 % are members of the largest church in Finland, the Evangelical Lutheran (The Evangelical Lutheran Church of Finland, 2018). Traditionally people in the Nordic countries have considered membership in the national church important (often referred to as "belonging without believing"). However, during the early 21st century particularly young adults have left the church, proposedly because it does not reflect their personal values (Niemelä, 2015). Also, other studies have noted that the Finns' belief in the Christian God is somewhat fluctuating, and declining (Ketola, Hytönen, Salminen, Sohlberg, & Sorsa, 2017). Still, however, in a study by the Pew Research Center (2018), 77% of the Finnish participants named their current religion as Christian. The attitudes towards Christians is generally positive in Finland, and there are indications that this is because Christianity is paralleled with the national identity (Ketola, 2011). Still, Finnish people generally have rather strong critical attitudes toward religion, and towards strong religiosity in particular (Ketola, 2011). A total of 24 % of the Finnish population is not member of any religious community (Official Statistics of Finland, 2015), but may still be religious (Ketola, Hytönen, Salminen, Sohlberg, & Sorsa, 2017). Concerning atheists, a 23% of Finns do not believe in God's existence, with the age group 25-34 year olds consisting in the largest group of non-believers, 38% (Ketola, Hytönen, Salminen, Sohlberg, & Sorsa, 2017). According to a survey from 2011, 13% of the population and 22% of young adults identified as atheist (The Church Research Institute, 2012). The attitudes in Finland toward atheists tended to be neutral or positive

(62%), whereas 26% of participants reported having fairly or very negative views about atheists (The Church Research Institute, 2012).

The first Jewish community was established in Finland in the first half of the 19th century when the Jewish soldiers who had served in the Tsar's army, were given permission to settle in Finland. However, in the beginning their civil rights were limited (Jewish Community in Helsinki, n.d.). Historically, anti-Semitism in Finland was latent, embedded in cultural and bureaucratic practices rather than directly in legislation (Holmila & Silvennoinen, 2011). Further, the Finnish historiography long maintained that Finland was not involved in the Holocaust in any respect, but this has later been questioned. There is for example evidence that Finland deported some Jewish persons to Nazi Germany. The most known deportation was that of eight Jewish persons in 1942 (Holmila & Silvennoinen, 2011); seven of them lost their lives at the Auschwitz concentration camp (Jewish Community in Helsinki, 2014). There are also indications that Finland sent Jewish Soviet prisoners of war to Germany in connection to the Holocaust (Holmila & Silvennoinen, 2011).Today, the number of Jewish people in the Finnish population is 1133 persons (Official Statistics of Finland, 2015). During the last years, the anti-Semitic actions against the Jewish community have increased (Assulin, 2015), although generally the level of anti-Semitic attitudes in Finland is relatively low (Pew Research Center, 2018).

There has been a Muslim population in Finland since the late 19th century, when the Tatars community was established in the country (Sakaranaho, 2017). The number of individuals who are officially registered as Muslim in Finland is less than a half percent (Official Statistics of Finland, 2015). However, due to immigration and asylum applications the estimated number of Muslims in Finland is currently between ca. 50 000 (Sakaranaho, 2010) and roughly estimated 70 000 (Demokraatti, 2015), meaning around 1-1.3 % of the population. The Muslim population is to a large part formed of first-generation immigrants and consists mainly of Somalis, Arabs, Kurds, Kosovo Albanians, Bosnians, and Turks (Rissanen, Tirri, & Kuusisto, 2015). Negative views of Islam in Finland are common (Ketola, 2011) and, for example, 62% of participants in a study believed Islam to be incompatible with Finland's values and culture (Pew Research Center, 2018).

The ethnic groups in the studies consisted in migrants from the Middle East and migrants from Africa, which are the most common origins of the asylum seekers in Finland. In 2015 and 2016, Finland experienced a large influx of mainly from the Middle East (with the four most common countries of origin being Iraq, Afghanistan, Iran, and Syria; Finnish Immigration Service, 2019) and Africa (with the four most common countries of origin being Somalia, Eritrea, Nigeria and Morocco; Finnish Immigration Service, 2019). In the aftermath of the influx, a strengthening of the public anti-immigration rhetoric was observed (Keskinen, 2015). Other foreign groups included were Russians and Romanian beggars, both of whom are reported to face prejudiced attitudes (Korhonen, Jauhola, Oosi, & Huttunen, 2016; discussion also in Shakir & Tapanainen, 2004). Attitudes toward Russians may partly have their roots in the two countries' shared history. The Grand Duchy of Finland (largely the same area as today's Finland) was an autonomous part of Russia 1809-1917, with increased Russification from the end of 1800 onwards (Olkkonen, 1987). Later Finland and the Soviet Union fought two devastating wars, the Winter War 1939-1940 and the Continuation War 1941-1944 (Laine, 1987).

Romanian beggars, who frequently face ethnic discrimination and poverty in their home countries, first appeared in Finland after the enlargement of the European Union in 2007 which facilitated people's movements (Mäkinen, 2013). Street begging is unusual and is seen as not "fitting" in the Finnish welfare system where the state is expected to care for those who cannot meet their basic needs (Mäkinen, 2013). The Romanian beggars were met with largely negative attitudes (Roman, 2014) and in the public rhetoric they were for example associated with increased social problems (Mäkinen, 2013). However, there have also been efforts to provide the Romanian beggars with basic services (Roman, 2014).

During the last decade, the differences in income level have risen in Finland (Official Statistics Finland, 2018c). In addition, the Finnish center-right government of 2015-2019 introduced austerity measures, which were criticized of targeting unemployed and low-income individuals to a larger extent than other groups (Kangas, Olli & Kalliomaa-Puhaa, 2017). We estimated that this would be reflected in an increased polarization between socio-economic and political groups. We therefore included right-wingers, left-wingers, feminists and persons with high income, unemployed, housewives and persons living on disability pension.

The Sami people, Finland-Swedes, and Finland's Roma people represent the Finnish national minorities. The indigenous Sami people have experienced discrimination, for example in questions regarding land-ownership (Shakir & Tapanainen, 2004). There is a debate about the legitimacy of considering Finland a colonialistic power in relation to the Sami; nevertheless, there are several examples of colonialistic policies and practices between the Finns and the Sami (Nyyssönen, 2011). In addition, the Sami people have been portrayed in a degrading light by popular culture (Typpö, 2017). Of Finland-Swedes there is partly a historical conception as belonging to an upper class culture and there are some reports of them facing prejudice (Korhonen, Jauhola, Oosi, & Huttunen, 2016). On the other hand, the Finland-Swedes also tend to be physically healthier (Suominen, 2014) and their right to use their own language is protected by the constitution (Finnish constitution, 17§, 11.6.1999/731).

Finland's Roma people are not to be confused with the other included group, Romanian beggars. Finland's Roma people are a cultural and language minority that has resided in Finland for more than 500 years (Ministry of Social Affairs and Health, 2004). In the early 20th century there were efforts to integrate the Roma people with the majority population, for example by separating Roma children from their parents and placing them in orphanages (Ministry of Social Affairs and Health, 2004). In 1970-1990, the services for the Roma increased for example by improving their living conditions and starting to teach their language within basic education. In 1995 legislative changes secured the Roma people's right to their own language and culture (Ministry of Social Affairs and Health, 2004). However, Roma people report experiencing frequent harassment, like name calling and verbal abuse (Korhonen, Jauhola, Oosi, & Huttunen, 2016).

Sexual minority groups included gay persons and transpersons. There is a relatively high acceptance level toward gay and lesbian people in Finland (Van Der Star & Bränström, 2015), whereas trans people face more discrimination and prejudice. For example, in a Finnish survey 82% of young trans persons reported facing harassment or inappropriate treatment from the environment (Alanko, 2014). The public knowledge of trans terminology was only established by the 1970-1980's, and the acknowledgment of the existence of trans persons emerged relatively late (Lehtonen, 2000). Homosexual acts were decriminalized in 1971 (SETA, n.d.-a), and homosexuality was removed from the disease classification in

1981 (Socada, 1998). A law about registration of same-sex partnerships was introduced in 2002, and a gender-neutral marriage law in 2017. On the other hand, Finland is the only one of the Nordic countries that still requires sterilization of persons undergoing corrective surgery of their biological sex (SETA, n.d.-b).

We also included groups related to physical health aspects; people with physical disability, elderly, and obese persons. Negative out-group attitudes have previously been linked to evolved disease-avoidance mechanisms (Faulkner, Schaller, Park, & Duncan, 2004). Earlier literature (Park, Faulkner, & Schaller, 2003) has also shown that physical disability can evoke negative emotional reactions from the environment, as suggested because humans' evolved disease-avoidance mechanisms that are sensitive to anomalous physical features, even those that are not actual There are some indications for that overweight persons (Johansson, Böckerman, Kiiskinen, & Heliövaara, 2009) and elderly persons (Eläkeläisliittojen etujärjestö, 2016) experience discrimination in Finland.

Finally, we added groups that could be associated with crime and/or threats to physical safety. These groups could elicit negative emotions and attitudes as they are perceived threatening (Cottrell & Neuberg, 2005). The groups we added in this category were sex workers, persons with substance use disorder, and psychiatric patients. Persons with substance use disorder are generally viewed negatively among the Finnish population. For example, 78% of the population would not want a person with substance use disorder as their neighbor (Mielenterveyden Keskusliitto, 2015). A total of 32% would not want to have a person with schizophrenia as their neighbor, and 18% would not accept a recovering psychiatric patient as their neighbor (Mielenterveyden Keskusliitto, 2015).

In Finland, buying sexual services from a young person or a victim of sexual trade is criminalized (Criminal Code of Finland, 20:8). In addition, selling sexual services in a public place is illegal (Public Order Act 7 §). There is a general stigma toward sex workers in Finland (Kontula, 2005). A survey conducted among Finnish students found that attitudes toward selling sexual services was somewhat more negative than positive, however, with men being significantly more positive towards the phenomenon than women (Räsänen & Wilska, 2007).

Original Publications

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ARTICLE

A Finnish adaptation of the emotion regulation questionnaire (ERQ) and the difficulties in emotion regulation scale (DERS-16)

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Abstract

The emotion regulation questionnaire (ERQ) and a short form of the difficulties in emotion regulation scale (DERS-16) were psychometrically evaluated in a Finnish, population-based sample (n = 409 for ERQ, n = 400 for DERS-16). The original two-factor structure of the ERQ was supported, after eliminating one item due to low loadings. A five-factor structure was supported for DERS-16, after dropping two items due to cross loadings. Both scales showed adequate internal consistencies. Women had a significantly stronger tendency to use reappraisal strategies than men did, and men used suppression significantly more than women. There were no gender differences on DERS-16. Age affected both ERQ and DERS-16. We conclude that both scales are psychometrically adequate for use in the Finnish population even though validation studies are needed.

Keywords: Emotion regulation, emotion regulation questionnaire, ERQ, difficulties in emotion regulation scale, DERS-16, age, gender

Humans regulate their emotions in order to change the intensity, duration or quality of particular emotions they experience (Gross & Thompson, 2007). A widely used model of emotion regulation, the process model of emotion regulation, was presented by Gross (1998). According to this model, emotion regulation can take place during different time points along the emotion generative process. In the broadest sense, regulation can occur before (*antecedent-focused*) or after (*response-focused*) the emotion generative event, that is, in the emergence of the emotion response. Antecedent-focused emotion regulation strategies include *situation selection* – choosing which situations to attend based on their potential emotional impact; *situation modification* –changing aspects of a situation in order to affect the emotional effects; *attentional deployment* –changing one's focus on different emotion-evoking aspects of the situation, and *cognitive change* –changing the meaning one places on the situation. *Response modulation* is a response-focused strategy and involves modifying the emotion response.

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The way humans regulate their emotions has significant effects on their psychological well-being, affective and cognitive functioning and social interaction (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Gross, 2002, 2015; Roberton, Daffern, & Bucks, 2012). Given the myriad of functions that are affected by emotion regulation, it is not surprising that there has been a considerable academic interest about the topic during the last two decades (Gross, 2015). A general search in academic databases (PsycINFO, PubMed and Google Scholar) suggests that research on emotion regulation has also experienced increased geographical spreading (e.g. Matsumoto, Yoo, & Nakagawa, 2008). This may highlight the considerable sociocultural variations in emotion experience and expression (Butler, Lee, & Gross, 2007; Haga, Kraft, & Corby, 2009; Markus & Kitayama, 1991; Mauss & Butler, 2010) and is directly reflected in the variation in the research results about emotion regulation strategies that has been conducted in different contexts. Measures developed for emotion regulation may not be applicable *per se* across different populations, whereby it is necessary to evaluate the existing measures for different settings and populations.

A frequently used measure of emotion regulation strategies is the emotion regulation questionnaire (ERQ) (Gross & John, 2003) which was developed to measure the tendencies to use two distinct emotion regulation strategies: expressive suppression (a response-focused strategy) and cognitive reappraisal (a form of cognitive change, an antecedent-focused strategy). When analysing the factor structure, Gross and John (2003) found that indeed a two factor model was most fit for the data, with reappraisal and suppression items loading on the two respective factors (Gross & John, 2003). Since then, other studies have replicated the two factor solution fully (Balzarotti, John, & Gross, 2010; Cabello, Salguero, Fernández-Berrocal, & Gross, 2013; Melka, Lancaster, Bryant, & Rodriguez, 2011) or partially or with modifications (e.g. Nives Sala et al., 2012; Spaapen, Waters, Brummer, Stopa, & Bucks, 2014; Wiltink et al., 2011).

Several studies have found significant gender effects on the tendency to use either reappraisal or suppression. A frequent finding across cultures is that men tend to habitually use more expressive suppression than women, and that there are no gender differences in the use of cognitive reappraisal (Cabello et al., 2013; Gross & John, 2003; Haga et al., 2009; Kwon, Yoon, Joormann, & Kwon, 2013), however, there are also differing reports which show gender differences in reappraisal (reviewed by Tamres, Janicki, & Helgeson, 2002), differences in both reappraisal and suppression (Rogier, Garofalo, & Velotti, 2017), or no gender effects for suppression (Nolen-Hoeksema & Aldao, 2011). The gender differences echo the gender socialization theory and Western gender norms according to which it is generally more acceptable for women to display emotions than for men (Fischer & Manstead, 2000). For example, a cross-cultural study of 37 countries found gender differences in crying proneness in all countries studied, including Finland (van Hemert, van de Vijver, & Vingerhoets, 2011).

There have also been indications that age affects how an individual uses emotion regulation strategies. For example, Diehl, Coyle, and Labouvie-Vief (1996) found that the tendency to cognitively reinterpret a situation increased with age, as did also the tendency to suppress emotions. Additional results of age effects on emotion regulation strategies have been reported by Wiltink et al. (2011), Larcom and Isaacowitz (2009) and Gómez-Ortiz, Romera, Ortega-Ruiz, Cabello, and Fernández-Berrocal (2015). On the other hand, some studies have found no age effects on the whole ERQ (Spaapen et al., 2014) or on one of the subscales (reappraisal; Wiltink et al., 2011). Potential theoretical bases for the age differences in emotion regulation are discussed further ahead.

An additional aspect of emotion regulation is emotion dysregulation, that is, when the regulation of emotion fails. To measure emotion regulation difficulties Gratz and Roemer (2004)

developed the difficulties in emotion regulation scale (DERS), which consists of six subscales: nonacceptance of emotional responses, difficulties engaging in goal-directed behaviour, impulse control difficulties, lack of emotional awareness, limited access to emotion regulation strategies, and lack of emotional clarity. Different shorter versions of the scale have been developed (Bjureberg et al., 2016; Kaufman et al., 2016; Victor & Klonsky, 2016). The current study evaluated the DERS-16 (Bjureberg et al., 2016). The DERS-16 items tap on five different latent variables, in contrast to the original six-factor DERS (Gratz & Roemer, 2004; Ritschel, Tone, Schoemann, & Lim, 2015). In creating the short scale, Bjureberg et al. (2016) decided to drop the items measuring awareness due to low item-total correlations, resulting in a five-factor model. A five factor solution was also reported by Bardeen, Fergus, and Orcutt (2012), Fowler et al. (2014) and Cho and Hong (2013). Miguel, Giromini, Colombarolli, Zuanazzi, and Zennaro (2016) assessed the psychometric properties of the original DERS and the DERS-16 in a Brazilian sample and found that the AWARENESS subscale of the original DERS had weak psychometric qualities. It is also worth mentioning that other solutions have been reported in the literature; Muñoz-Martínez, Vargas, and Hoyos-González (2016) analysis resulted in a two-factor solution with 15 items, and Medrano and Trógolo (2016) found that a four-factor solution produced the strongest model fit.

As mentioned, there is some variability in how women and men regulate their emotions, for example women use different emotion regulation strategies to a larger degree than men (Nolen-Hoeksema, 2012). Women have also been found to use both putatively adaptive and maladaptive emotion regulation strategies to a larger degree than men (Nolen-Hoeksema & Aldao, 2011). Nevertheless, previous literature has generally not found gender differences in the total DERS score, only on some of the subscales. An exception was found in a study using an adolescent sample, where Neumann, van Lier, Gratz, and Koot (2010) reported women scoring higher than men, and Gratz and Roemer's (2004) original study, where men had higher scores on the AWARENESS subscale. Gender differences on other subscales have also been reported (Miguel et al., 2016; Mitsopoulou, Kafetsios, Karademas, Papastefanakis, & Simos, 2013).

There are results indicating that with increasing age, individuals tend to acquire more efficient emotion regulation skills (Urry & Gross, 2010). Older adults seem to generally have less difficulties to regulate their emotions than the younger ones (Orgeta, 2009) and to be able to more effectively regulate and control their emotions (McConatha & Huba, 1999). Further, some age effects have been found on the DERS scale or its subscales specifically (Miguel et al., 2016; Mitsopoulou et al., 2013). The results of age differences in both the ERQ and the DERS resonate with the socioemotional selectivity theory (SST; Carstensen, Isaacowitz, & Charles, 1999), which posits that with increasing age, individuals tend to place more importance on emotional, rather than knowledge-related goals, because they perceive their remaining time of life as limited. They thereby place more importance to the emotional quality of social relationships and assume a greater motivation to appreciate the positive aspects of life (Carstensen et al., 2011, 1999). This motivation leads the older individuals to more effectively regulate their emotions, so that they optimize emotionally gratifying experiences and avoid potentially negative emotional experiences (Carstensen, Fung, & Charles, 2003). For example, they can actively choose to spend more time with emotionally meaningful and satisfying social contacts, rather than with peripheral and less satisfying ones (English & Carstensen, 2014).

The aim of the present study was to psychometrically evaluate the Finnish translations of the ERQ (Gross & John, 2003) and the DERS-16 (Bjureberg et al., 2016) in a Finnish population-based sample. The latent variables were examined through confirmatory factor analysis and the internal consistencies, item-total and inter-item correlations were assessed. In addition, gender and age effects and associations between the scales were explored.

Method

Participants and procedure

A random sample of 5000 Finnish-speaking inhabitants aged 18–64 years was drawn from the Finnish Population Register Centre and every selected person was mailed an invitation letter to participate in the study. The letter stated the purpose of the study in general terms, stressed the voluntary and anonymous nature of the participation and it featured a link and a QR code to the internet page that contained more information about the study and the informed consent page. After giving their consent to participate, the participants were directed to the survey. All measures were completed online. In Finland, 93% of 16–74 year olds use the internet (Statistics Finland, 2015). The recruitment was part of a study investigating the relationship between emotion regulation and attitudes towards different outgroups, which is reported elsewhere (Westerlund, Antfolk, & Santtila, 2018). A total of 636 of the invited participants entered the survey site and/or completed the survey partially, and 316 completed the whole survey. A total of 409 respondents completed the whole ERQ and 400 respondents completed the whole DERS-16. Demographic information about the sample is presented in Table 1.

Table 1. Demographic information.

	n (%)
Gender	
Female	249 (57.2)
Male	186 (42.8)
Age (years)	
18–29	127 (29.1)
30–39	72 (16.5)
40–49	77 (17.7)
50–59	101 (23.2)
>60	59 (13.5)
Level of education	
Primary school	36 (8.3)
High school	65 (14.9)
Vocational upper secondary	116 (26.6)
Bachelor/Polytechnic	125 (28.7)
Master's degree or above	94 (21.6)

Measures

The ERQ is a 10-item self-report scale that was introduced by Gross and John (2003), and it contains six items measuring cognitive reappraisal and four items that measure expressive suppression. The responses are given on a Likert-type scale from 1 (*strongly disagree*) to 7 (*strongly agree*). In the original study (Gross & John, 2003), across four different samples the Cronbach's α's for the two subscales were between .75 and .82 (reappraisal items) and .68 and .76 (suppression items). In the same study, it was found that individuals who tended to use cognitive reappraisal more frequently experienced and expressed more positive emotions, with the opposite being true for individuals who habitually use more expressive suppression strategies. These findings have since been partly or fully replicated in other studies (Balzarotti et al., 2010; Butler et al., 2007; Gillanders, Wild, Deighan, & Gillanders, 2008; Ioannidis & Siegling, 2015; Verzeletti, Zammuner, Galli, Agnoli, & Duregger, 2016).

The ERQ has been translated and validated in several different samples, including Swedish (Enebrink, Björnsdotter, & Ghaderi, 2013), Australian and British (Spaapen et al., 2014), Spanish (Gómez-Ortiz et al., 2015), Brazilian (Batistoni, Ordonez, Silva, Nascimento, & Cachioni, 2013), German (Abler & Kessler, 2009; Wiltink et al., 2011), and Italian (Balzarotti et al., 2010). Several of these studies have provided support for ERQ's criterion-related validity. The reappraisal scale has been found to be positively associated with social functioning like marital adjustment (Enebrink et al., 2013), with openness to experience and self-esteem (Gómez-Ortiz et al., 2015), positive affect (Balzarotti et al., 2010; Batistoni et al., 2013; Ioannidis & Siegling, 2015), and it has been negatively associated with depression (Batistoni et al., 2013) and negative affect (Ioannidis & Siegling, 2015; Spaapen et al., 2014). Expressive suppression has been positively associated with depression, anxiety and stress (Spaapen et al., 2014), social anxiety (Gómez-Ortiz et al., 2015; Ioannidis & Siegling, 2015), negative self-esteem (Gómez-Ortiz et al., 2015), and negatively associated with positive affect (Ioannidis & Siegling, 2015) as well as with positive affect and social functioning (Balzarotti et al., 2010). Nevertheless, expressive suppression has also been found to be negatively related to worrying (Ioannidis & Siegling, 2015) and not associated with increased negative affect (Balzarotti et al., 2010; Ioannidis & Siegling, 2015).

The Finnish translation of the ERQ (Vuorela & Nummenmaa, 2004) was downloaded from the Stanford Psychophysiology Lab Resources web site (https://spl.stanford.edu/resources). Vuorela and Nummenmaa (2004) pilot-tested and tested the Finnish translation of the ERQ and found its psychometric properties to be appropriate.

Difficulties in emotion regulation scale (DERS). The DERS was developed by Gratz and Roemer (2004) and consists of 36 items that aim to measure an individual's typical level of emotion dysregulation. The original DERS showed validity, excellent internal consistency ($\alpha = .93$) and an overall good test-retest-reliability. In the present study, the data collection was conducted as part of a larger survey battery, whereby it was decided that a short form of the DERS would be used in order to make the responding less time-consuming. The DERS-16 by Bjureberg et al. (2016) was used, because it was partly validated in a clinical sample in Sweden, which is a fellow Nordic country and culturally similar to Finland. In addition, the psychometric properties of DERS-16 were equally strong compared to the other versions of the scale. The scoring of DERS-16 is equal to the original DERS. For each item, the respondents use a Likert-scale to rate from 1 (*almost never*) to 5 (*almost always*) how often each statement applies to them.

There are several translations and validation studies of the DERS, including a French (Dan-Glauser & Scherer, 2013), Turkish (Rugancı & Gençöz, 2010), Greek (Mitsopoulou et al., 2013), Persian (Mazaheri, 2015; short forms), Italian (Giromini et al., 2012), Romanian (Bostan & Zaharia, 2016), Brazilian (Miguel et al., 2016), and Colombian (Muñoz-Martínez et al., 2016). DERS has been found to be positively associated with alexithymia (Giromini et al., 2012; Mazaheri, 2015; Miguel et al., 2016), affect lability (Bjureberg et al., 2016), psychological symptoms like anxiety, depression and stress (Bardeen et al., 2012; Bjureberg et al., 2016; Mazaheri, 2015; Rugancı & Gençöz, 2010), dissociative experiences (Giromini et al., 2012), characteristics associated with personality disorders (Miguel et al., 2016), experiential avoidance (Gratz & Roemer, 2004) and suppression and intrusion of thoughts (Bjureberg et al., 2016).

The Finnish translation of the 16 items was compiled from an existing Finnish translation of the original DERS (Tapolaa, Lappalainen, & Wahlström, 2010), which was translated and back-translated with the permission of the author of the original scale.

Data analyses

The data analyses aimed at investigating the factor structure of both the ERQ and the DERS-16. First, the items of the ERQ and the DERS were assessed by exploratory factor analysis using SPSS 24.0. Before the analysis, the skewness and kurtosis values were inspected in order to verify them being at an acceptable level (< 3 and < 10, respectively; Kline, 2011). The Bartlett's test of sphericity, the Kaiser-Meyer-Olkin (KMO) and the values in the anti-image correlation matrix were inspected. The confirmatory factor analyses were done using AMOS 24.0 (Arbuckle, 2016), starting by testing the models suggested by the exploratory factor analysis (two factor model with one item dropped for ERQ, and a five-factor model for DERS). The factor structures were inspected using maximum-likelihood estimation. Several goodness-of-fit indicators were inspected; the χ^2, normed χ^2 (Wheaton, Muthen, Alwin, & Summers, 1977), the comparative fitness index (CFI; Bentler, 1990), the Tucker-Lewis Index (TLI; Tucker & Lewis, 1973) and the root-mean square error of approximation (RMSEA; Steiger & Lind, 1980; Steiger, 2016). In reference to Hu and Bentler (1999), the cut-off values for the fit indices were close to .95 for CFI and TLI, below .06 for RMSEA and a non-significant chi-square. The GFI and NFI indices were not included due to their sensitivity to large samples (Fan & Sivo, 2007).

For the ERQ, a total of three models were tested. The first tested model was one where the two factors were allowed to correlate freely (the unconstrained model). Then, a model where the two factors were not allowed to correlate (the independent model) was tested, followed by a general factor model, where all items loaded on one single factor. Composite variables were formed of the means of the ERQ items as indicated by the factor loadings. Cronbach's αs, item-total and inter-item correlations were assessed with SPSS 24.0. The effects of age and gender were assessed with MANOVAs, with the ERQ factors as dependent variables and age group or gender, respectively, as independent variables. Finally the scale intercorrelation was explored.

The steps of the analysis of the DERS were similar to that of the ERQ. In the confirmatory factor analysis, three different models were tested; a five-factor model, a four-factor model and a general factor model. The effects of age and gender were assessed with MANOVAs, using the DERS factors as dependent variables and age group or gender, respectively, as independent variables. The mean scores of the subscales were compared between gender and age groups using Bonferroni-corrected t-tests. Finally, correlations between ERQ and DERS were performed.

Results

Emotion regulation questionnaire

Factor structure. The skewness and the kurtosis were below the recommended guidelines (< 3 and < 10, respectively; Kline, 2011). The skewness was below 1 or above –1 for all items except for two (1.30 and –1.11), and the kurtosis was below 1 or above –1 for three items (–1.16, 1.56 and 1.36). The exploratory factor analysis was done with varimax-rotation. The factorability of the items was confirmed with Bartlett's test of sphericity ($\chi^2[45] = 1137.50$, $p < .001$) and the Kaiser-Meyer-Olkin measure of sampling adequacy (*KMO* = .72). All the values in the anti-image correlation matrix were >.58. Three factors had eigenvalues greater than 1 (2.78, 2.37 and 1.15), however, the scree plot suggested a two factor solution. The two-factor solution was chosen for its clarity, interpretability and correspondence with the two factors on the original scale. The factor loadings are displayed in the supplemental material. Item number 5 had a weak loading of .30 as well as a low communality value (.17), and was, therefore, dropped from further analyses.

The analysis of the two-factor model suggested by exploratory factor analysis, with item 5 dropped and the two factors correlating freely (the unconstrained model), did not produce a satisfactory model fit ($\chi^2[26] = 177.88$, $p < .001$, CFI = .86, IFI = .86, TLI = .80, RMSEA = .12). The Modification Indices indicated that when allowing certain errors to co-vary, fit indices would increase. These items form part of the Reappraisal factor and are conceptually similar since they all describe changing emotions by changing the way of thinking. After allowing the errors of these items to covary (item 1 and 10, item 10 and 7, and item 7 and 3), the fit indices were nearly optimal (CFI = .96, IFI = .96, TLI = .94, RMSEA = .066 (90% CI: .047–.085), depicted in Figure 1. The χ^2 was significant ($\chi^2[23] = 63.53$, $p < .001$), which, however, is common for large samples ($n = 409$). The normed χ^2 (Wheaton et al., 1977) (χ^2/df), on the other hand, was 2.76. It has been suggested that the normed χ^2 should fall below 2.0 (Tabachnik and Fidell, 2007), 3.0 (Bollen, 1989) or 5.0 (Wheaton et al., 1977), whereby the value for this model can be considered acceptable.

In addition to the unconstrained model, two other models were tested. A general factor model, where all items loaded on one general factor resulted in a poor fit: $\chi^2[27] = 685.12$, $p < .001$, CFI = .38, IFI = .38, TLI = .17, RMSEA = .24 (90% CI = .23–.26). An independent model where the two factors were not allowed to correlate, produced a rather acceptable fit: $\chi^2[27] = 182.86$, $p < .001$, CFI = .85, IFI = .85, TLI = .80, RMSEA = .12 (90% CI = .10–.14). When allowing the error covariances as suggested by the Modification Indices (between items 1, 3, 8 and 10), the resulting model fit was nearly identical to the unconstrained model: $\chi^2[24] = 66.72$, $p < .001$, CFI = .96, IFI = .94, TLI = .96, RMSEA = .066 (90% CI = .048–.085). Two composite variables, Reappraisal and Suppression, were formed of the means of the remaining nine ERQ items as indicated by the factor loadings. Figure 1 presents the final factor structure.

Reliability. The Cronbach's αs, item-total and inter-item correlations are presented in Table 2. All measures support the reliability of the scales. The inter-item correlations for Suppression were more close to ideal range (.20–.40), indicating that the items are similar enough, but still contributing uniquely to the measure. The items for Reappraisal had higher inter-item correlations, which suggest that the items may overlap. All corrected item-total correlations were of acceptable magnitude.

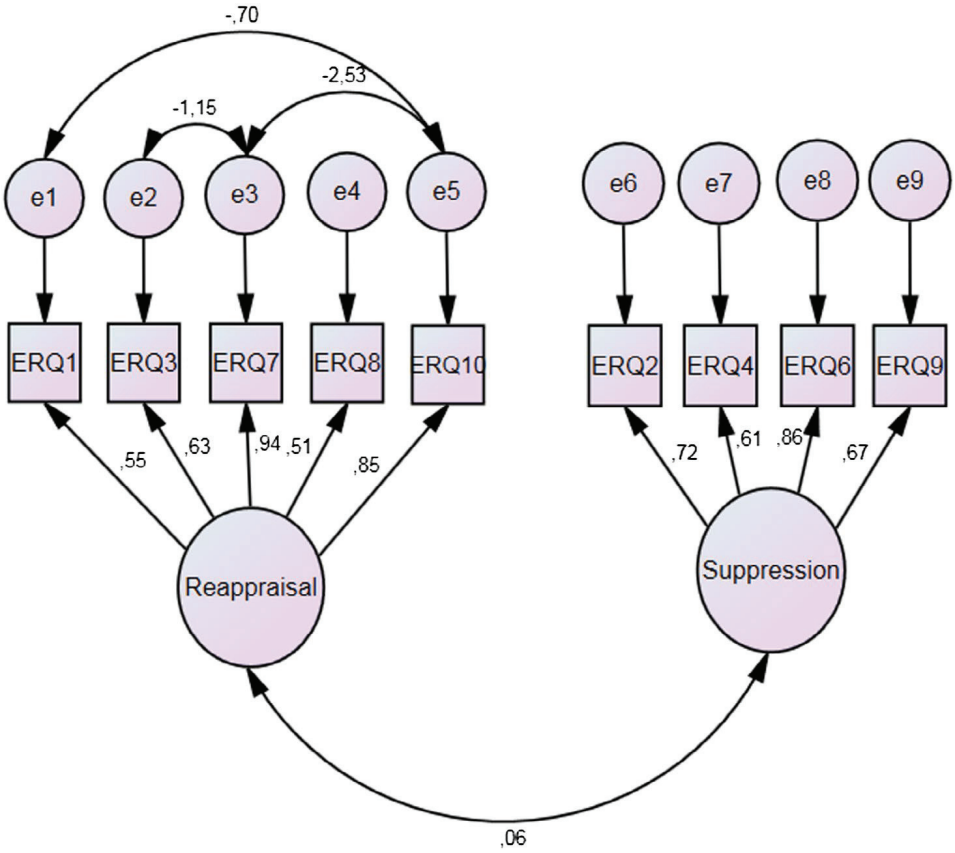

Figure 1. The factor structure of the ERQ. Source: Authors.

Effect of gender. A MANOVA was used to detect possible effects of gender, using reappraisal and suppression as dependent variables, and gender as independent. Using Pillai's trace, there was a significant effect of gender on reappraisal and suppression, $V = .11$, $F(2, 407) = 23.89$, $p < .001$. The univariate tests showed a significant gender effect for both reappraisal, $F(1, 408) = 9.89$, $p = .002$, and suppression, $F(1, 408) = 31.27$, $p < .001$. Women reported using reappraisal strategies more than men ($M = 4.60$, $SD = 1.15$, and $M = 4.24$, $SD = 1.05$, respectively; $t(409) = -3.29$, $p < .001$, Cohen's d = .33). In contrast, suppression was significantly more reported by men than women ($M = 3.61$, $SD = 1.25$, and $M = 2.97$, $SD = 1.11$, respectively, $t(409) = 5.44$, $p < .001$, Cohen's $d = 0.54$). Overall, the participants tended to use more reappraisal ($M = 4.45$, $SD = 1.12$) than suppression ($M = 3.24$, $SD = 1.21$), $t(410) = 15.46$, $p < .001$, Cohen's $d = 0.76$) strategies.

Table 2. Cronbach's *α's, item total and inter-item correlations for the ERQ subscales.*

Subscale	Cronbach's α	Range of item-total correlations	Range of inter-item correlations
Reappraisal	.74	.45–.57	.17–.50
Suppression	.81	.59–.73	.38–.61

Effect of age. Using reappraisal and suppression again as dependent variables, and age group (< 40 years and > 40 years) as independent, the effect of age was tested. The assumption of homogeneity of variances was not met, and the samples were of different sizes. The variance-covariance matrices were inspected; the smaller sample produced larger values, indicating that significant results may not be reliable (Field, 2013; Tabachnik & Fidell, 2007). Therefore, the sample sizes were equalized by randomly deleting cases from the larger sample (Field, 2013). There was a significant effect of age on reappraisal and suppression, $V = .03$, $F(2, 364) = 5.41$, $p = .005$. The univariate tests showed a significant age effect for reappraisal, $F(1, 365) = 8.19$, $p = .004$, and nearly a significant effect for suppression, $F(1, 365) = 3.57$, $p = .060$. The younger age group reported using reappraisal strategies more than the older ($M = 4.59$, $SD = 1.00$, and $M = 4.28$, $SD = 1.09$, respectively; $t(365) = 2.86$, $p = .004$, Cohen's $d = 0.30$). Also suppression was reported more by the younger group ($M = 3.34$, $SD = 1.29$, and $M = 3.10$, $SD = 1.09$, respectively, $t(355.62) = 1.98$, $p = .049$, Cohen's $d = 0.21$).

Scale intercorrelation. There was a significant correlation between reappraisal and suppression among women ($r = .22$, $p = .001$), but not for men.

Difficulties in emotion regulation scale-16

Factor structure. All the skewness and kurtosis values were as recommended (< 3 and < 10, respectively; Kline, 2011). The range of skewness was .55–2.19, and for the kurtosis –.44–4.56. The Bartlett's test of sphericity was $\chi^2[120] = 3773.24$, $p < .001$ and the *KMO* was .93. All the values in the anti-image correlation matrix exceeded .89. Four factors showed eigenvalues above 1 (7.82, 1.28, 1.05 and 1.01). The inspection of the scree plot showed a clear slope after five factors. Since the five-factor solution was clearly interpretable and corresponded to the solution found by Bjureberg et al. (2016), five factors were extracted. Fourteen of the sixteen items loaded on the same factors as in the original study by the authors of DERS-16, and two items that originally loaded on STRATEGIES, loaded now on GOALS (item 16) and NONACCEPTANCE (item 14). Items 14 and 16, however, also loaded on STRATEGIES, and based on these cross loadings the items were deleted from further analyses. The resulting model was then evaluated by confirmatory factor analysis, and indicated a good fit with the exception of the chi-square, which was significant; $\chi^2[67] = 139.98$, $p < .001$, normed $\chi^2 = 2.09$, CFI = .98, IFI = .98, TLI = .97 and RMSEA = .05 (90% CI = .40–.64). The model is presented ín Figure 2.

Based on earlier literature (Medrano & Trógolo, 2016) supporting a four-factor solution, and since CLARITY had only two items and could hence be a weaker factor, a four-factor model was assessed. However, this model did not have a stronger model fit than the five-factor one. Similarly, a general factor model, where all items loaded on a single factor, produced a poor model fit. Lastly, five composite variables of the DERS-16 items were formed according to the results of the confirmatory factor analysis. The factor loadings for DERS-16 are presented in the supplemental material.

Reliability. Table 3 presents the reliability data on the DERS-16 subscales. The internal consistency for the whole scale was excellent, $\alpha = .91$. All item-total correlations were over .30, indicating

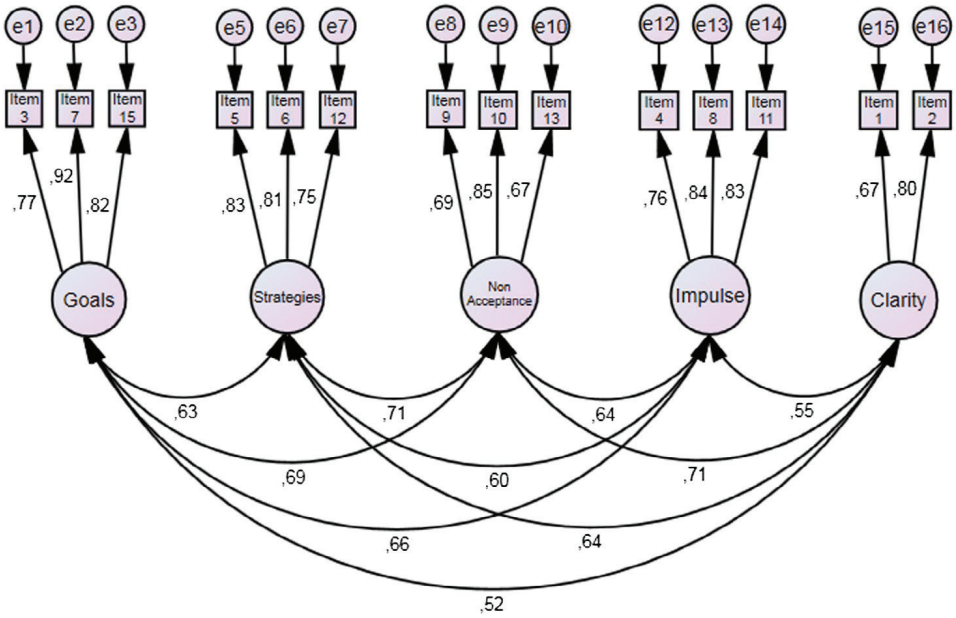

Figure 2. The factor structure of the DERS-16. Source: Authors.

adequate reliability. The inter-item correlations were relatively large, suggesting lower unique variance contributed by each item.

Effect of gender. The multivariate analyses revealed no significant effects of gender on the DERS-16 nor its subscales. Similarly, the univariate analyses showed no significant effect of gender on any of the scales. The mean scores of the DERS-16 and each subscale are presented in Table 4. Except for STRATEGIES, the mean values for the subscales were higher for women than for men; however, *t*-tests with Bonferroni correction for multiple comparisons revealed that none of the differences were statistically significant. The mean scores of the DERS-16 are comparable, although somewhat lower, to the results of the US community sample of female participants reported by Bjureberg et al. (2016), where $M = 33.57$, $SD = 13.14$. The current mean results of the DERS-16 were lower than what was reported by Miguel et al. (2016) in a Brazilian sample, where men scored $M = 43.46$ ($SD = 15.30$) and women $M = 44.81$ ($SD = 15.01$).

Table 3. Cronbach's *α's, item-total and inter item correlations of the DERS-16 subscales.*

Subscale	Cronbach's α	Range of item-total correlations	Range of corrected inter-item correlations
GOALS	.87	.71–.83	.60–.75
STRATEGIES	.84	.68–.72	.61–.66
NONACCEPTANCE	.79	.60–.65	.52–.59
IMPULSE	.85	.67–.74	.62–.72
CLARITY	.70	.54	.54

Note: DERS whole scale $\alpha = .91$.

Effect of age. The assumption of homogeneity of variances was again not met, and eventually the sample sizes were equalized by random deletion from the larger group. In a MANOVA, the DERS-16 subscales were used as dependent variables, and age group (<40 years and >40 years) as independent. There was a significant effect of age on all the subscales, $V = .10$, $F(5, 348) = 7.53$, $p < .001$. The univariate tests showed a significant, moderate to large age effect for all the subscales (Table 4). The mean scores for both age groups across all the subscales are presented in Table 4. *T*-tests with Bonferroni correction revealed that all differences between mean scores were statistically significant, with the younger group scoring higher than the older group on all scales.

Correlations with ERQ. The correlations with DERS-16 were $r = .12$, $p = .015$ for reappraisal, and $r = .20$, $p < .001$ for suppression. Reappraisal correlated significantly with GOALS ($r = .12$, $p = .018$), NONACCEPTANCE ($r = .17$, $p < .001$) and CLARITY ($r = .15$, $p = .003$). Suppression correlated significantly with STRATEGIES ($r = .27$, $p < .001$), NONACCEPTANCE ($r = .25$, $p < .001$) and CLARITY ($r = .24$, $p < .001$).

Discussion

The objective of this study was to psychometrically evaluate the Finnish versions of the ERQ and the DERS-16. The factor structure, internal consistencies, item-total, inter-item correlations, gender and age effects on the scales were explored.

Sample characteristics

The current sample did not demographically differ considerably from the general population (OECD, 2013; Statistics Finland, 2017). The largest differences in the share of each age group compared to those of the overall population is around 5%. The sample consists to a somewhat larger amount of women (around +7%) than would be expected from the population structure. The final sample is also somewhat more educated than the general population; 8% fewer had only a primary-level degree and about 10% more had a tertiary degree (OECD, 2013).

Factor structure of the ERQ

In the assessments of the latent structure, the original factor structure of the ERQ (Gross & John, 2003) could nearly be confirmed, however, with the modification of dropping item number 5. This reflects results from previous studies, where the item has produced lower factor loadings on reappraisal than the other items (Balzarotti et al., 2010; Cabello et al., 2013; Enebrink et al., 2013; Gross & John, 2003; Nives Sala et al., 2012). This can reflect that the item partly taps on a distinct dimension than the other Reappraisal items. One alternative is that the item may primarily measure attempts of emotion control rather than cognitive change. The other Reappraisal items have a more evident emphasis on cognitive change. Another reason for the low loadings for item 5 on Reappraisal may be due to the sample that was studied. The Finnish culture encourages moderation and calmness in most emotion expression (including in stressful situations), whereby the item may signal different meanings to Finnish respondents than to samples consisting of other nationalities.

It must be stressed that an acceptable model fit for ERQ was reached only after allowing certain errors to covary. This suggests that part of the shared variance is due to the latent variable and

Table 4. Mean scores on DERS-16 and the subscales per gender and age, differences in mean scores between age groups, and results from univariate ANOVA.

	All (n = 400)		Females (n = 231)		Males (n = 168)		Age <40 years (n = 180)		Age >40 years (n = 220)		Differences in scores/ age groups			Effects of age		
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*t*	*df*	Cohen's *d*	*F*	*df, df*	*p*
DERS-16 (14 items)	27.10	9.25	27.28	9.44	26.79	9.01	29.86	9.78	24.83	8.15	5.51***	348.24	.56	29.83	1, 352	<.001
GOALS	9.63	3.83	9.75	3.92	9.44	3.69	10.70	4.01	8.76	3.43	5.13***	353.92	.52	24.75	1, 352	<.001
STRATE-GIES	4.79	2.32	4.66	2.23	4.92	2.39	5.35	2.75	4.33	1.77	4.32***	292.89	.44	20.98	1, 352	<.001
NONAC-CEPTANCE	6.14	2.79	6.30	2.90	5.91	2.62	6.92	3.07	5.50	2.35	5.11***	329.11	.52	26.47	1, 352	<.001
IMPULSE	5.06	2.29	5.10	2.30	5.01	2.28	5.38	2.41	4.79	2.16	2.58*	363.17	.26	5.96	1, 352	.015
CLARITY	3.58	1.29	3.58	1.22	3.57	1.37	3.84	1.35	3.36	1.19	3.82***	398	.38	12.93	1, 352	<.001

Notes: All differences in mean scores between gender groups were nonsignificant.
*p = .05
**p = .01
***p < .001.

part due to an external source. In the case of questionnaire items, correlated errors may arise for example from items that overlap in content (Byrne, 2010) or items that are very similarly worded (Brown, 2006), of which the latter is a likely explanation in the case for the ERQ Reappraisal items. All the items that the modification indices suggested error covariances between had similar wording, as described above.

Gender effects on the ERQ

In accordance with previous research, there were apparent gender differences in the ERQ; women reported using significantly more cognitive reappraisal than men did, and men reported using more expressive suppression strategies than women. The effect sizes were moderate to strong. The gender differences were expected based on previous literature as referenced above (Cabello et al., 2013; Gross & John, 2003; Kwon et al., 2013; Rogier et al., 2017) and are likely reflecting the norms in Western societies according to which it is more acceptable for women to express emotion than for men (Fischer & Manstead, 2000). The current findings are supported for example by findings from Batistoni et al. (2013; the difference did not reach statistical significance), but they differ, however, from a number of other studies in that there were gender differences not only in the use of expressive suppression, but also in cognitive reappraisal. As suggested by Nolen-Hoeksema (2012), the greater tendency for women to engage in generally adaptive emotion regulation strategies such as cognitive reappraisal may correspond to findings indicating that girls show greater abilities in effortful control than boys (for a meta-analysis, see Else-Quest, Hyde, Goldsmith, & Van Hulle, 2006). Effortful control includes planning the behavior, and being able to knowingly modify, restrict and initiate attention and behavior (Eisenberg, Smith, Sadovsky, & Spinrad, 2011, p. 263) and it has hence an essential role in emotion regulation (Eisenberg et al., 2011).

Another aspect that may increase adaptive regulation of emotion in women is that they tend to have greater awareness about their emotions compared to men (Barrett, Lane, & Sechrest, Schwartz, 2000; Nolen-Hoeksema, 2012) as well as higher emotional reactivity (Bradley, Codispoti, Sabatinelli, & Lang, 2001; Kemp, Silberstein, Armstrong, & Nathan, 2004). Women may therefore be more sensitive to perceiving different emotions, whereby they more frequently have the need to consciously regulate them. This may also be reflected in the results showing a significant correlation between suppression and reappraisal for women, but not for men. Another possibility that may be at play in women's greater use of cognitive reappraisal in this sample is culture-specific gender roles. Culture has been found to affect the use of cognitive reappraisal (Haga et al., 2009) and it is possible that the cultural factors affecting the level of reappraisal would be further mediated by gender. This is an aspect worth further research.

Age effects on the ERQ

There was a moderate sized effect of age in the ERQ subscales, showing that younger participants used cognitive reappraisal more than the older. The use of suppression also showed a tendency to decrease with age. A similar result was reported by Nolen-Hoeksema and Aldao (2011), who found higher use of reappraisal in young adults compared to older adults. For suppression, however, they found higher means among the older adults. Haga et al. (2009) reported that individuals under 25 years of age used suppression more than those above 25 years. The current finding can be interpreted in the light of results obtained by Scheibe, Sheppes, and Staudinger(2015), where older more than young participants preferred distraction over cognitive reappraisal to

regulate the emotions evoked by negative visual material. The use of distraction provides immediate emotional relief, which is in accordance with the socioemotional selectivity theory (Scheibe et al., 2015) of older adults being motivated to decrease negative emotional states promptly. The current results could reflect the same phenomenon. This possibility should be further explored in future research.

The factor structure of the DERS-16

The five factor structure for the DERS-16 could be replicated from the studies by Bjureberg et al. (2016) and Miguel et al. (2016), but two items were dropped due to cross loadings. The items were number 14 and number 16. They loaded on NONACCEPTANCE and GOALS, respectively, and both also loaded on STRATEGIES. Item 14 seems closely related to a non-acceptance of emotional reactions. A verbatim translation of the item is not possible, and it is likely that the Finnish version of the item can be interpreted as the individual having a negative self-evaluation when feeling upset, similarly as item 10 of NONACCEPTANCE. As for item 16, the word "overwhelming" could be interpreted as being of such great emotional impact that it prevents the individual from goal-directed action (i.e. the person "freezes").

Gender effects on the DERS-16

The mean scores for the DERS were similar, albeit somewhat lower, to what was reported for a US community sample of female participants in Bjureberg et al.'s (2016) study. The mean score for the clinical sample reported in the same paper was twice the size in comparison, suggesting the clinical utility of the measure. The female participants in the current sample reported higher scores on the DERS-16 compared to the male; the women scored higher on all subscales, except for STRATEGIES, where the men scored slightly higher, but the differences were not statistically significant. As discussed earlier, a number of studies have not detected gender differences in the DERS scores. Nevertheless, as discussed above, men and women frequently report differences in how they regulate emotions (Nolen-Hoeksema, 2012). This may reflect actual differences in emotion regulation processes, for example due to differences in emotional reactivity, but it could also be a result of the variations in the language men and women use to describe emotional experiences (Anderson, Reilly, Gorrell, Schaumberg, & Anderson, 2016; Nolen-Hoeksema, 2012). In a recent study, Anderson et al. (2016) suggested that the gender differences in emotion regulation measures may be results of measurement bias rather than actual gender differences. Further, the authors noted that studies have failed to replicate the original factor structure of DERS and that this may partly be due to those bias. They examined differential item functioning (DIF) in the items of DERS and found significant DIF in a number of items and clinically significant in two. Three of those items are included in the DERS-16 that was used in the current study. As recommended by the authors of the study, future research should continue to explore possible variance that is not related to the construct and that is due to group membership (i.e. gender).

Age effects on the DERS-16

There were age differences on the DERS-16 as a whole, as well as on each of its subscales, indicating that with age the difficulties in emotion regulation decrease. This is in line with previous literature that has found that emotional reactivity and lability tends to reduce with age (Carstensen et al., 2011; Röcke, Li, & Smith, 2009). The finding is also consistent with the socioemotional selectivity theory, according to which a perception of having limited time left in life motivates the

individual to strive after positive and meaningful emotional experiences. In addition, emotion regulation has been found to be affected by age-related changes in attention, memory and brain functions (for a review, see Mather, 2013), and the socioemotional functioning in older age could also be affected hormonal alterations (Ebner, Kamin, Diaz, Cohen, & MacDonald, 2015).

Convergent validity

There were some significant correlations between the ERQ subscales and the DERS-16 and its subscales, which were larger and more significant between ERQ suppression and the DERS-16 subscales, compared to the significant correlations between ERQ reappraisal and the DERS-16 subscales. This may reflect the general, putative maladaptivity of expressive suppression compared to cognitive reappraisal, and suggest the validity of the measures. Interestingly, both ERQ subscales correlated with CLARITY and NONACCEPTANCE, albeit to somewhat different degrees. A possible explanation to this is that individuals who have difficulties regulating their emotions need to employ more strategies to neutralize their emotions. Indeed, Dixon-Gordon, Aldao, and De Los Reyes (2015) found that a high use of several emotion regulation strategies was associated with increased psychopathology symptoms. According to the authors, this may indicate that individuals with more psychopathology require more down-regulation of emotional experiences. Also, the habitual use of a high number of emotion regulation strategies may indicate dysfunctional, ineffective use of emotion regulation (Dixon-Gordon et al., 2015). Another perspective is provided by Aldao and Nolen-Hoeksema (2012) who found in a cross-sectional study that adaptive emotion regulation was negatively associated with psychopathology only when maladaptive strategies were high. This could be reflected in our results showing correlations between reappraisal and suppression and DERS.

Final considerations

It would be interesting to study how culture may influence the emotion regulation measures, for example on how different items are interpreted, and what kind of emotion expression is experienced as problematic. It would also be useful to evaluate DERS-16 within Finnish clinical samples in order to assess its clinical usefulness. The present results cannot be applied on clinical samples since the participants were selected from the general population. Nevertheless, we believe both scales now evaluated can facilitate clinical assessments by helping the clients describe their typical emotional patterns, which otherwise may be challenging to verbalize, especially for clients unaccustomed to psychological terminology. Emotion regulation skills are positively associated with mental health, and training of emotion regulation skills improves the efficacy of cognitive behaviour therapy (Berking et al., 2008). The ERQ and DERS can be used to assess change in emotion regulation skills, both clinically and as one part of psychotherapy research.

Limitations

There are several limitations to the present study. The ERQ and the original DERS together with the short forms of the scale have shown to have adequate validity (Bardeen et al., 2012; Bjureberg et al., 2016; Gratz & Roemer, 2004; Victor & Klonsky, 2016), but this should ideally also be investigated in a Finnish sample to complete the evaluation of the psychometric qualities of the measures in the Finnish context. It was not the aim of the present article and, further, not possible to thoroughly investigate the measures' validity, because additional psychometric instruments

were not included in the survey. Due to the anonymous nature of the participation, it was also not possible to conduct test-retest assessments.

The response rate remained low. In addition, many participants did not complete the whole survey. It is possible that participants who have a special interest in the survey topic could have been more likely to complete the whole survey. Further, the whole survey was conducted online, whereby there has with great likelihood been significant variation in the assessment situations across the respondents. There was no possibility to verify the identities of the respondents or to provide them with clarifications about the instructions. On the other hand, the anonymity of the survey may have increased the respondents willingness to provide truthful answers (Krumpal, 2013).

Conclusions

Both ERQ subscales and all DERS-16 subscales show adequate internal consistency and item-total and inter-item correlations, indicating reliability in the Finnish general population. Support was found for the original ERQ factor structure, and for a five-factor structure for DERS-16. A recommendation is to confirm the scales' validities and particularly the DERS-16 scale's usefulness in Finnish clinical samples.

Disclosure statement

No potential conflict of interest was reported by the authors.

Supplemental data

The supplemental data for this article is available online at https://doi.org/10.1080/19012276.2018.1443279.

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II

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Negative views of out-groups and emotion regulation strategies: Evidence for an association with the tendency to suppress emotion expression, but not with cognitive reappraisal or emotion dysregulation

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Abstract
Emotions influence attitudes and appraisals toward out-groups, including prejudice. We hypothesized that individuals who successfully regulate emotions will express more positive attitudes toward out-groups. We conducted an online study of associations between emotion regulation and attitudes toward out-groups in a Finnish population-based sample ($N = 320$). As hypothesized, expressive suppression was associated with decreased acceptance toward out-groups, but contrary to our hypothesis, cognitive reappraisal was not associated with increased acceptance. In exploratory analyses, we found that individuals with more cognitive reappraisal (vs. expressive suppression) had a higher acceptance of out-groups, and that emotion regulation may not influence attitudes toward all out-groups equally. In conclusion, we present novel results indicating that habitual emotion regulation strategies are differently associated with attitudes toward a broad array of out-groups, and that the sociocultural aspects of emotion regulation toward out-group attitudes may play a role.

Keywords Emotion regulation · Expressive suppression · Cognitive reappraisal · Prejudice · Out-groups

During the recent decade, there has been a surge in public anti-immigration rhetoric and attitudes in Europe (Vieten and Poynting 2016). This phenomenon of intergroup hostility has traditionally been examined focusing on cognitive representations and processes (Miller et al. 2004). However, when observing intense intergroup interactions, such as rallies between rivalling political groups, it is evident that also emotions play an important role in out-group attitudes. We assessed whether the ability to successfully regulate those emotions is associated with decreased negative attitudes toward out-groups. If modifying emotional responses is related to increased intergroup acceptance, it could constitute a significant complement to programs and interventions aimed at decreasing intergroup hostility.

Emotions and cognitions are closely interrelated (Scherer 2009; Blanchette and Richards 2010; Izard 2010). This is reflected in certain central theories of out-group attitudes that include affective components (e.g. Zawadzki 1948; Allport 1985), and especially in appraisal theories of emotions (discussed in Moors et al. 2013), which posit that emotional reactions depend on the individual's interpretation of the situation. Emotions again activate certain appraisal tendencies, which are relatively automatic and steer the following perceptions and decision-making (Lerner and Keltner 2000). For example, if an individual perceives that an out-group is unjustifiably receiving better social services than the group he or she identifies with, the emotional reaction can be anger. This negative emotion may then affect subsequent out-group related emotions, appraisals and attitudes (Halperin and Gross 2010). Previous literature has indeed linked emotions to prejudice. For example, Tenenbaum et al. (2018) conducted an experiment in a sample of British young people where they induced positive or negative emotions through a written emotion recall manipulation, and later measured attitudes toward asylum seekers' rights and feelings toward asylum seekers. The authors found

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that inducing positive emotions increased acceptance toward asylum seekers. Miller et al. (2004) showed in two survey studies among white college students that emotions predicted prejudice toward out-groups, and that emotions mediated the relationship between prejudice and intergroup contact, and political predispositions, respectively. Similarly, Kessler et al. (2010) found in a large longitudinal, two-wave panel survey study of German 13–18 year old pupils that positive intergroup emotions were negatively related to a variety of prejudice measures. Also Tapias et al. (2007) found support for the association between prejudice and specific emotions toward out-groups among university students in two studies; a survey study and a study in which the participants were first exposed to out-group priming, after which their reactions to stories designed to elicit different negative emotions were assessed.

The way an individual appraises a situation (or, in this case, an out-group) is, apart from emotional processes, also affected by several other, non-affective factors (Halperin et al. 2011). These include cultural (Moors et al. 2013), situational (Smith and; Kirby 2009) and intersectional factors (Wang et al. 2011), as well as personality and socio-economic status (Halperin et al. 2011). A thorough discussion of these factors is, however, beyond the scope of the present paper.

Emotion Regulation and Out-Group Attitudes

Humans are not merely passive emitters of emotion, but can actively affect their emotional experience (Mauss et al. 2007). The term emotion regulation refers to how individuals influence their own emotional state; what emotions they have, when, and how they experience and express them (Gross 1998). Since emotions are strongly associated with prejudice, we expected that modifying and regulating those emotions will be associated with an alteration of attitudes toward out-groups.

As described by Aldao (2013), emotion regulation strategies are often categorized into adaptive and maladaptive strategies based on their relationship with psychopathology symptoms. However, adaptive emotion regulation may imply different things in different settings, and whether or not emotion regulation strategies are adaptive depends in the end on contextual factors (Aldao 2013): for example, depending on individual and situation characteristics (e.g., Nolen-Hoeksema and Aldao 2011; Pliskin et al. 2018), the interaction between different emotion regulation strategies (Nolen-Hoeksema and; Aldao 2011; Aldao and Nolen-Hoeksema 2013), and probably also on the type of emotion regulation measured (habitual or instructed emotion regulation; Wolgast et al. 2011). Also, stress may compromise the ability to adaptively regulate emotions (Raio et al. 2013). Given the importance of contextual factors, Aldao (2013) recommends specifying the components that affect emotion regulation when conducting research in order to gain a broader understanding of the factors affecting the process. In the current paper, as we discuss next, we used a survey study to investigate the associations between trait-level emotion regulation and attitudes toward out-groups. We focused on two important emotion regulation strategies: *cognitive reappraisal* and *expressive suppression*.

Cognitive Reappraisal Involves reassessing a situation, changing its meaning, and thereby modifying its emotional impact (Gross 1998). For example, if an out-group member avoids eye contact during a conversation, the discussion partner may interpret the behaviour as rude and feel annoyance as a result. However, if the person cognitively reappraises the situation by thinking that the out-group member acts according to their cultural norms without an intention of insulting, the negative emotion is likely to be downregulated. This emotion regulation strategy has been found to effectively reduce negative emotions and increase positive emotions (Gross and John 2003; Nezlek and Kuppens 2008) and it is generally considered an adaptive form of emotion regulation and has been linked to less psychopathology (Aldao et al. 2010, but see also Nolen-Hoeksema and; Aldao 2011). It is thus likely that individuals who habitually use more cognitive reappraisal experience a lesser magnitude of negative emotions and thereby less negative emotions also toward out-groups. Since emotions trigger a tendency to perceive and appraise objects and situations in a way that is consistent with the original appraisal-patterns of that emotion (Lerner and Keltner 2000), decreased negative out-group emotions would likely result in more tolerant attitudes toward out-groups. Indeed, previous studies suggest that cognitive reappraisal is associated with more positive attitudes toward out-groups. Halperin and Gross (2011) found in a nationwide survey that among Israelis, after controlling for sociopolitical variables, the use of cognitive reappraisal was positively associated with support for humanitarian aid for Palestinians. In another survey study using a representative sample, Halperin and colleagues (Halperin et al. 2014) reported a negative correlation between the use of cognitive reappraisal and political intolerance in Israeli citizens during the 2009 Gaza war. Further, investigating causal effects in a sample of students, the authors found that, when participants prone toward political intolerance were instructed to use cognitive reappraisal while reading a news article prompting intolerance, both their negative emotions and intolerance decreased compared to a control condition. Similarly, Halperin et al. (2013) found in a laboratory study with a sample of Israeli university students that applying cognitive reappraisal after a brief training in response to anger-inducing material decreased the level of anger toward Palestinians and decreased support for aggressive policies. Similar findings were presented in a second study that included a 5-month follow-up assessment. Alkoby et al. (2017) found that among Jewish-Israelis, an 8–13 week mindfulness training and a brief cognitive reappraisal training (both individually and combined) increased the

support for compromise solutions of the Israel-Palestinian conflict, compared to a waitlist control. The effect was mediated by a reduction in negative emotions toward Palestinians. Relatedly, Lee et al. (2013) found in survey studies among US participants that cognitive reappraisal was negatively associated with support for conservative policies, and that it also decreased moral concerns related to conservatism by reducing the emotion of disgust. The authors suggest that the results may transfer into political attitudes, for example, regarding immigration and gay marriage.

There are also findings indicating that different emotion regulation strategies interact, and it is thus motivated to consider not only individual emotion regulation strategies, but also their relation to each other. Aldao and Nolen-Hoeksema (2012) found that cognitive reappraisal and other adaptive emotion regulation strategies had a negative association with psychopathology only when the level of maladaptive strategies was high. Results in the same direction have been reported by Otterpohl et al. (2016). See also Bonanno and Burton (2013) for a discussion on regulatory flexibility.

Expressive Suppression. The other well-researched form of emotion regulation is expressive suppression, which involves inhibiting the expression of an emotional response (Gross 1998). In contrast to cognitive reappraisal, expressive suppression has been associated with increased or prolonged duration of negative emotions (Gross and John 2003; Nezlek and Kuppens 2008), likely because whereas expressive suppression effectively decreases the *expression* of an emotion, the *experience* of the emotion may still prevail and be left unresolved (Gross and John 2003). This aversive emotional state again can negatively affect later appraisals (discussed in Bodenhausen, Mussweiler, Gabriel and Moreno 2001, see also Lerner and Keltner 2000), such as appraisals about out-groups. Previous literature provides support for this notion. Expressive suppression is closely related to experiential avoidance (Kashdan, Barrios, Forsyth and Steger 2006; Su, Wei and Tsai 2014), which refers to unwillingness to experience unpleasant emotions, thoughts, bodily sensations and behavioral predispositions (Hayes, Wilson, Gifford, Follette and Strohsal 1996). Experiential avoidance forms part of a larger construct of psychological inflexibility, which has been shown to predict generalized prejudice (Levin, Luoma, Vilardaga, Lillis, Nobles and Hayes 2016). Another further possible mechanism relates to the individual's ability to cope with possible automatic prejudiced reactions; psychologically inflexible individuals may for example be more likely to act on the prejudiced beliefs (Levin, Luoma, Vilardaga, Lillis, Nobles and Hayes 2016). Expressive suppression has been linked to psychopathology (Aldao et al. 2010) displaced aggression (Scott et al. 2015) and self-reported aggressive behaviour (after controlling for trait anger) among men who have been exposed to interpersonal violence (Tull et al. 2007).

Burns et al. (2008) studied the causal effect of emotional suppression (which includes both expressive and experiential suppression) in heterosexual participants while watching a video about a gay couple. Individuals high in prejudice reported more positive emotions in the suppression group than in the control group, which the authors suggested indicated overcompensation in regulatory efforts due to lesser experience regulating emotions toward stereotyped targets. In the present study we, however, expected that individuals with a higher degree of habitual expressive suppression will experience more negative emotions in general, which will be reflected in more negative views toward out-groups. We based this expectation on other available research indicating that the use of suppression is associated with a larger degree of negative and smaller degree of positive emotions (Gross and; John 2003; Nezlek and Kuppens 2008; Balzarotti et al. 2010;). In addition, Burns et al. (2008) measured the causal effect of suppression in response to a specific stimulus material, whereas we aimed to study trait expressive suppression in relation to general attitudes toward out-groups.

In sum, based on the previous literature, we proposed that individuals who habitually rely on expressive suppression are less able to neutralize negative emotional states compared to individuals who tend to use cognitive reappraisal. As a result, negative emotional states are more likely to prevail in these individuals. These negative emotions again influence the formation of attitudes toward out-groups, given the influence affective components have on cognition.

Emotion Dysregulation. Even when experiencing negative emotions, adaptive emotion regulation aims at modulating the emotional response, rather than eliminating it (Gratz and Roemer 2004), and thus allowing the individual to function well in a given context (Bridges et al. 2004). Cognitive reappraisal and expressive suppression both generally meet these criteria. Difficulties arise when the frequency and severity of maladaptive regulation increases. Emotion dysregulation refers to the inability to regulate emotional experiences, expressions and responses in regular settings (Linehan et al. 2007). Emotion dysregulation is a component and a risk factor of certain psychopathologies (Campbell-Sills and Barlow 2007; Aldao et al. 2010). Like expressive suppression, emotion dysregulation is associated with negative affect and increased aggression (see Roberton et al. 2012 for a review). Studies on the association between emotion dysregulation and out-group attitudes are limited in number. One study that taps into this field was conducted by Schlachter and Duckitt (2002). They found in a clinical sample that an avoidant-negativistic personality characteristic (consisting of features generally associated with emotion dysregulation; e.g. borderline, avoidant, negativistic) was indirectly, positively associated with prejudice, mediated via negative affective symptoms.

Zipris, Pliskin, Canetti and Halperin (2019) conducted a study in the aftermath of the 2014 war in Gaza using a survey including emotion-inducing stimuli. They found that individuals who were exposed to political violence and had emotion dysregulation characteristics were more likely to have post-traumatic symptoms and negative emotions, and to support militant action and collateral damage (toward the out-group).

Due to the association between emotion dysregulation and negative affect, as well as the strong relationship between negative emotions and prejudice, we expected that emotion dysregulation is associated with increased levels of prejudice toward out-groups. Individuals who fail to effectively down-regulate negative emotions (including emotions toward out-groups) would remain with higher levels of negative emotions and stronger negative emotional states. These negative emotions again influence subsequent appraisals, for example those of out-groups (Lerner and Keltner 2000). Individuals with more emotion dysregulation characteristics should, therefore, with a greater likelihood express negative attitudes toward out-groups.

Gender Differences. As mentioned previously, successful emotion regulation takes place in accordance with social norms. However, norms for acceptable emotion expression frequently differ for men and women (Fischer and Manstead 2000; see also Brody 2000). In fact, several studies have found that men tend to use expressive suppression more than women, whereas there are small or no gender differences in the use of cognitive reappraisal (e.g., Gross and John 2003; Rogier et al. 2017), although results are somewhat mixed (Tamres et al. 2002). A study by McRae et al. (2008) reported gender differences in the neural bases for cognitive appraisal. Women use both adaptive and maladaptive emotion regulation strategies to a larger degree than men (Nolen-Hoeksema and Aldao 2011). Concerning out-group attitudes, women also tend to report less prejudice than men (Akrami et al. 2000). Due to these reported gender differences in emotion regulation and out-group attitudes, we assessed whether our main analyses were influenced by gender in order to avoid generalizing a possibly gender-specific association to the whole population. We expected that the earlier research was reflected in our results, so that men reported more suppression and negative attitudes toward out-groups than women.

The Current Study

In sum, we proposed that emotion regulation and emotion dysregulation are associated with explicit attitudes toward different minority groups. Although most previous research has been conducted in conflict settings with attitudes toward specific antagonist groups as outcome measure, there is abundant literature from non-conflict settings supporting the association between emotions and prejudice more generally (Miller et al. 2004; Tapias et al. 2007; Kessler et al. 2010; Tenenbaum et al., 2018). Effective regulation of those (negative) emotions is, therefore, likely to attenuate, or even prevent, negative appraisals and attitudes toward out-groups (Gross et al. 2013).

We conducted a correlational study using an online survey to which we invited a random, population-based sample of Finns. We expected that:

1. Participants who rely predominantly on expressive suppression will have less favorable attitudes toward out-groups in general.
2. Participants who rely predominantly on cognitive reappraisal will have more favorable attitudes toward out-groups in general.
3. Participants who express emotion dysregulation characteristics will have less favorable attitudes toward out-groups in general.

Due to differences in emotion regulation and out-group attitudes between men and women as reported above, we also assessed whether the associations were moderated by gender. We also examined how self-identification with the out-groups moderated the associations.

Finally, we performed three exploratory analyses in order to guide future research questions: First, since part of emotion regulation can occur outside conscious control (Mauss et al. 2007), we investigated the associations between automatic emotion regulation and attitudes toward out-groups (Electronic Supplementary Material 1). Second, we wanted to explore whether the association between emotion regulation strategies would differ between sub-samples of out-groups. Lastly, we wanted to assess whether participants who rely more on cognitive reappraisal *relative* to expressive suppression have more favorable attitudes toward out-groups in general.

Method

Participants and Demographics

A random sample of 5000 Finnish-speaking citizens (18–64 years) was drawn from the Population Register of Finland and we sent them invitation letters to participate in the study. A total of 307 participants (6.1%) completed the whole survey, and 628 (12.6%) of the invited participants entered the survey web page and/or completed the survey partially. The total number of participants who responded to the items included in the hypothesis testing was 320.

Ethical Permission

The study plan was approved by the Board for Research Ethics at Åbo Akademi University.

Procedure

We collected all self-report data online. In Finland, 93% of 16–74 year-old individuals use the internet (Statistics Finland 2015). We sent the entire sample an invitation by post, stating that the recipient had been randomly selected to an anonymous, voluntary study about societal opinions and emotional experiences. The first page of the online survey described the anonymous, voluntary nature of the study and the data handling. Informed consent was obtained from all individual participants included in the study. The participants were told that they could participate in a draw of a cinema ticket.

Measures

Demographic Information We asked the participants for gender, age, marital status, residential region, mother tongue, highest level of education, and level of religiosity on a scale (1 = extremely religious, 10 = extremely non-religious). Demographic information is presented in Table 1.

Emotion Regulation Questionnaire (ERQ) We assessed emotion regulation using the 10-item Emotion Regulation Questionnaire (Gross and John 2003). ERQ measures the habitual use of cognitive reappraisal and expressive suppression. Answers to all items are given on a 7-point Likert scale (1 = "strongly disagree", 7 = "strongly agree"). The measure has been validated in European community samples (e.g. Enebrink et al. 2013; Balzarotti et al. 2010). We obtained the Finnish translation (Vuorela and Nummenmaa 2004) of the ERQ from the Stanford Psychophysiology Lab Resources web site (https://spl.stanford.edu/resources). A factor analysis of the Finnish translation (Westerlund and Santtila 2018) supported the expected two factor solution with item number 5 dropped due to low factor loadings. The cognitive reappraisal scale had a Cronbach's α of .74, and the expressive suppression scale .81.

Table 1 Demographic information

	Complete responses *n (%)*
Gender	
Female	188 (58.8)
Male	131 (40.9)
Age (years)	
18–29	103 (32.2)
30–39	57 (17.8)
40–49	54 (16.9)
50–59	70 (21.9)
above 60	36 (11.3)
Highest level of education	
Primary school	23 (7.2)
High school	53 (16.6)
Vocational upper secondary	77 (24.1)
B.A. / Polytechnic	97 (30.3)
Master's degree or above	70 (21.9)

Difficulties in Emotion Regulation Scale (DERS-16) We measured emotion dysregulation using a 16-item version (Bjureberg et al. 2016) of the Difficulties in Emotion Regulation Scale (Gratz and Roemer 2004). The DERS-16 has five of the original six latent factors of DERS: Nonacceptance of Emotional Responses, Difficulties Engaging in Goal-Directed Behavior, Impulse Control Difficulties, Limited Access to Emotion Regulation Strategies, and Lack of Emotional Clarity (Gratz and Roemer 2004; Bjureberg et al. 2016;). The scale has been validated in clinical and community samples (Bjureberg et al. 2016). The translation was gathered from an existing Finnish translation of the original DERS (Tapolaa et al. 2010).

A factor analysis (Westerlund and; Santtila 2018), supported the expected five factor model with two items (number 14 and 16) dropped. The subscales had adequate internal reliability (Cronbach's α = .70–.90).

Stress Measure We used a single-item stress measure to screen participants for experienced level of stress since we wanted to control for this factor, which may compromise otherwise adaptive emotion regulation. This measure has been employed in Finnish occupational health studies, and has shown satisfactory validity in different Finnish samples (Elo et al. 2003). The response was recorded on a 5-point Likert scale ("*not at all*" to "*very much*").

Attitudes Toward Out-Groups In line with Duckitt and Sibley's (2007) study, we compiled a list of 26 different sexual, ethnic, cultural, religious, health-related and political/socioeconomic groups: Atheists, Christians, Muslims, Jews, migrants from the Middle East, migrants from Africa, right-wingers, feminists, left-wingers, Sami people, Finland-Swedes, Finland's Roma people, Russians, persons with high income, Romanian beggars, persons living on disability pension, housewives, the unemployed, gay persons, transgender persons, people with physical disability, elderly, sex workers, obese persons, persons with substance use disorder, and mental health patients. The participants recorded how negative or positive their general view on each group was on a Likert-type response scale, ranging from 1 ("very negative") to 7 ("very positive"). We summed the responses into a total score of

acceptance. To control for the participants' own minority status, we asked participants to state whether they themselves identified as any of these out-groups.

Different out-groups may elicit different levels of perceived threat (Cottrell and; Neuberg 2005). For our exploratory analyses, we wanted to assess, whether emotion regulation was differentially associated with different out-groups. We explored the attitudes toward the 26 groups with an exploratory factor analysis (Electronic supplementary material 2). This revealed five latent constructs; *ethnic out-groups* (groups ethnically distinct from the majority of Finnish nationals), *antinormative out-groups* (groups generally seen as actively departing from the mainstream norms, e.g., atheists, transgender persons), *crime-associated out-groups* (groups generally associated with crime; e.g., sex workers, persons with substance use disorder), *privileged out-groups* (groups generally seen as materially privileged), and *internal differing out-groups* (internal groups in the Finnish society, who may be perceived as differing from the mainstream, e.g., housewives, people with physical disability, and mental health patients).

Forced-Choice Test Given that the assessment of attitudes that violate existing social norms (like racism) is prone to social desirability bias (Krumpal 2013), six out-groups (Finland-Swedes, Migrants from developing countries, Muslims, Homosexuals, Unemployed, Disabled) were selected for a forced choice test for a comparison with the self-reported attitudes. We chose one group from each category of groups (i.e. sexual, ethnic, cultural, religious, health-related and socioeconomic groups). The forced-choice format prevents the participants from distorting their scores toward socially desirable answers since they are asked to choose one preferred group of two given options instead of scoring the groups more freely. This kind of questioning is likely to protect against desirable responding (Martin et al. 2002). Moreover, analyses of paired forced-choice data allows for interpreting outcomes on an interval scale (Kingdom and; Prins 2016) .

Automatic Emotion Regulation Since controlled emotion regulation requires considerable resources (Koole and Rothermund 2011) and situations requiring regulation of emotional responses occur constantly throughout the day, some of the emotion regulatory processes likely occur outside of the individual's awareness to reduce the costs of regulation (Mauss et al. 2007, see also Wang et al. 2017). In order to explore associations of automatic emotion regulation on outgroup attitudes we used a variant of the Implicit Association test (IAT; Greenwald et al. 1998); the emotion regulation IAT (ER-IAT; Mauss et al. 2006), which measures implicit evaluations of emotion regulation. However, the results from this measure were ambiguous and did not meaningfully complement the overall results. The description and the results from the ER-IAT are reported in the electronic supplementary material1.

Statistical Analyses

With a sample of 320 we had an .80 power to detect correlations as low as .16. No a priori power analysis was performed.

We conducted all analyses using SPSS 24.0, except for the analysis of the forced choice task, which was conducted with the prefmod-package (Hatzinger and Dittrich 2012) in R (R Core Team 2008). Moderation analyses were conducted with the PROCESS macro for SPSS (Hayes 2018). We explored the data to verify that the assumptions of the linear model were met. We explored linearity, independence of residuals and homoscedasticity graphically. To assess the effect of the extreme cases, we deleted four cases with both high Mahalanobis distances and high leverage, and repeated the regression analyses (Field 2013).

Hypothesis Testing To test the association of expressive suppression and cognitive reappraisal with attitudes toward out-groups, we created a total score reflecting individual acceptance of all out-groups. The associations between the ERQ subscales, the DERS-16 and the total score for acceptance of all out-groups were examined using a linear regression model. The moderation analyses to assess for the influence of gender and self-identification were conducted using the PROCESS macro (Hayes 2018), model 1, without centering the variables. We conducted the moderation analyses with standardized variables in order to obtain standardized regression coefficients.

We also tested the influence of eliminating extreme values and rerunning the analyses. Finally, there was a relatively large number of missing data, which carries a risk of reduction in statistical power and may lead to biased results. To address this, we repeated the hypothesis testing after performing multiple imputation to assess whether the analyses would yield similar conclusions as when restricted to the original data. We first conducted a missing values analysis, which indicated data missing mostly at random. Next, using SPSS's multiple imputation function, we generated 20 imputed datasets for the ERQ and DERS-16 items, the acceptance scores, as well as stress level, religiosity and age. We then conducted the regression analyses using z-scores of the variables in order to obtain pooled standardized regression coefficients.

Exploratory Testing In an explorative manner, we wanted to assess whether automatic emotion regulation was associated with the acceptance of out-groups. This analysis is reported in the electronic supplementary material 1.

We also explored whether the association between emotion regulation differed for different out-groups. We performed simple regression analyses where expressive suppression was entered as a predictor for acceptance of each of the five latent out-groups.

In addition, as previous literature has highlighted the importance of assessing the interaction of emotion regulation

strategies (Aldao and; Nolen-Hoeksema 2012), we wanted to explore whether the *balance* between emotion regulation strategies influenced the outcome. Therefore, we created a score for the difference between individual levels of the two emotion regulation strategies. We created a difference variable by subtracting the expressive suppression score from the cognitive reappraisal score. We then used simple regression analysis to investigate its association with acceptance of all out-groups.

Results

Descriptive Results

Means, standard deviations for ERQ, DERS-16, the median for the stress measure and correlations among the measures are reported in Tables 2 and 3. The correlations between the ERQ (particularly the Suppression scale) and DERS-16 indicated partial overlap, but overall the scales seem to tap into different constructs. In addition, stress correlates significantly with DERS-16, indicating that stress may jeopardize adaptive emotion regulation. The mean acceptance scores and the results of the exploratory factor analysis are found in the electronic supplementary material 2. The out-group preference scores from the forced-choice test corresponded largely with the self-reported acceptance scores. The preference scores are reported in the electronic supplementary material 3.

Demographic Factors and Emotion Regulation There was a significant correlation between education and the DERS scale ($r = -.12$, $p = .027$), implying that lower level of education was associated with increased emotion dysregulation.

Table 2 Mean scores on the DERS-16 and ERQ subscales, and the stress measure

	Women		Men		All	
	($n = 188$)		($n = 131$)		($n = 320$)	
	M	*SD*	*M*	*SD*	*M*	*SD*
DERS-16 scale*	27.44	9.84	26.41	8.63	27.04	9.36
GOALS	9.92	4.04	9.35	3.65	9.70	3.89
STRATEGIES	4.67	2.34	4.83	2.35	4.76	2.37
NONACCEPTANCE	6.30	2.97	5.92	2.57	6.14	2.81
IMPULSE	5.15	2.41	4.82	2.05	5.01	2.27
CLARITY	3.56	1.26	3.50	1.34	3.54	1.30
ERQ Reappraisal	4.59	1.06	4.20	1.00	4.43	1.05
ERQ Suppression	2.93	1.08	3.62	1.22	3.22	1.19
Stress measure	3 (Mdn)		3 (Mdn)		3 (Mdn)	

*Items 16 and 14 were excluded

Table 3 Correlations with DERS-16, ERQ subscales and the stress measure

	Reappraisal *r (p)*	Suppression *r (p)*	Stress measure *r (p)*
DERS-16 scale	.11 (.057)	.20 (<.001)	.42 (<.001)
GOALS	.12 (.039)	.09 (.110)	.38 (<.001)
STRATEGIES	−.01 (.814)	.26 (<.001)	.44 (<.001)
NONACCEPTANCE	.16 (.004)	.27 (<.001)	.33 (<.001)
IMPULSE	.04 (.435)	−.06 (.265)	.23 (<.001)
CLARITY	.13 (.018)	.24 (<.001)	.39 (<.001)
ERQ Reappraisal			.02 (.685)
ERQ Suppression			.04 (.504)

Non-religiosity was positively correlated with expressive suppression ($r = .21$, $p < .001$).

Hypothesis Testing

Hypothesis 1 and 2: Associations between Emotion Regulation and Attitudes toward Out-Groups

Next, we tested our hypothesis that expressive suppression is associated with less acceptance of out-groups and that cognitive reappraisal is associated with more acceptance of out-groups overall. The total score of acceptance of out-groups was predicted by expressive suppression, $b* = -.17$, $p = .002$, $F(1, 317) = 9.57$, $R^2 = .03$, $p = .002$. Self-identification with an out-group did not moderate this relationship ($b* = 0.13$, $p = .410$), nor did gender ($b* = 0.07$, $p = .529$).

The acceptance of out-groups overall was not predicted by the use of cognitive reappraisal ($b* = -.01$, $p = .935$). There was no evidence of moderation by gender ($b* = -0.05$, $p = .681$) nor self-identification ($b* = 0.31$, $p = .054$).

Hypothesis 3: Association between Emotion Dysregulation and Attitudes toward Out-groups

We proceeded to examine our hypothesized association between emotion dysregulation and attitudes toward out-groups. There was no support for this association, $b* = -.09$, $p = .098$, with $R^2 = .01$, $F(1, 317) = 2.75$. There was also no evidence for moderation by gender ($b* = -0.07$, $p = .556$) or self-identification ($b* = 0.13$, $p = .508$).

Finally, we repeated the testing of the three hypotheses after performing multiple imputation using 20 imputed data sets to assess whether our results were influenced by the missing data. The pooled results supported our earlier results: (H1) Expressive suppression predicted decreased acceptance of outgroups at $b* = -.18$, $p = .001$, and (H2) cognitive reappraisal did not predict acceptance toward out-groups, $b* = -.02$, $p = .749$. However, (H3) emotion dysregulation showed

to have a negative association with out-group acceptance, $b^* = -.12$, $p = .038$.

Exploratory Analyses We performed three explorative analyses. The description and the results of the first analysis which concerned the role of automatic emotion regulation is reported in the electronic supplementary material 1. The results did not meaningfully complement the overall results and showed some ambiguity.

Our second exploratory question aimed to extend the results from the main analysis. We wanted to explore whether the associations between expressive suppression and out-groups differed between the five latent out-groups. We performed simple regression analyses where expressive suppression was entered as a predictor. Two significant associations emerged: expressive suppression predicted decreased acceptance of internal differing out-groups ($b^* = -.21$, $p < .001$, with $R^2 = .04$, $F(1, 318) = 14.36$) and ethnic out-groups ($b^* = -.16$, $p = .005$, with $R^2 = .03$, $F(1, 318) = 8.13$).

Based on earlier literature concerning regulatory flexibility (Aldao and Nolen-Hoeksema 2012; Bonanno and Burton 2013; Otterpohl et al. 2016) we further wanted to assess how the relative distribution of the two emotion regulation strategies was related to out-group attitudes. We therefore explored whether a relatively higher degree of habitual cognitive reappraisal compared to expressive suppression would be associated with the attitudes toward all out-groups. There was a positive association between a relatively higher score of cognitive reappraisal than expressive suppression and acceptance of all out-groups ($b^* = .13$, $p = .018$, with $R^2 = .02$, $F(1, 318) = 5.7$). This association was not moderated by gender ($b^* = -0.10$, $p = .378$).

Discussion

We investigated the associations between emotion regulation strategies and emotion dysregulation on attitudes toward out-groups. We expected that participants with more habitual expressive suppression would have less favourable attitudes toward out-groups, and that habitual use of cognitive reappraisal would be associated with greater acceptance of out-groups. We also expected that participants with more emotion dysregulation would have less favourable attitudes toward out-groups.

In line with our first hypothesis, increased use of expressive suppression was associated with decreased acceptance of all out-groups. This reflects previous research, where expressive suppression has been linked for example to displaced aggression (Scott et al. 2015). On the other hand, the other form of generally maladaptive emotion regulation, emotion dysregulation, was not associated with the acceptance toward out-groups (the third hypothesis) before conducting the imputation. An interesting question, therefore, concerns which emotional components do play a role in intergroup attitudes. The findings suggest that the question may be about whether an emotion expression is inhibited or not. Gross and John (2003) suggest that expressive suppression may not be an effective means to reduce negative emotions if they are not the direct target of the regulation effort, leading to an accumulation of unresolved negative emotional experience. Emotion dysregulation, although not necessarily context-appropriate, may prevent such accumulation of negative affect through emotion expression. Gross and John (2003) showed that individuals who habitually used more expressive suppression were less satisfied with life, experienced more negative emotions, had lower self-esteem, less optimistic views on life and weaker social support.

All in all, the accumulated negative emotions together with the negative consequences of habitual expressive suppression could be a potential breeding ground for developing hostility toward out-groups. For example, individuals may make prejudiced evaluations of others to enhance their self-image (Fein and; Spencer 1997).

Nevertheless, the negative association between emotion dysregulation and out-group acceptance reached statistical significance in the analyses conducted after multiple imputation. Since emotion dysregulation has been linked to lack of perseverance (Fossati et al. 2014; Maxfield and Pepper 2018) it may be that individuals with less abilities to regulate negative states (for example fatigue) were more likely to discontinue the study. Future studies should further assess the relationship between emotion dysregulation and out-group attitudes.

We found no evidence for our second hypothesis that cognitive reappraisal would be related to attitudes toward out-groups. The result differs from earlier studies, in which cognitive reappraisal has been found to reduce out-group bias. Cognitive reappraisal strategies are effective in reducing negative out-group bias in contexts with greater polarization between groups and stronger negative intergroup emotions (for example in intractable conflicts; e.g., Halperin et al. 2013). It may be that these effects on prejudice are weaker in less emotional settings, in the absence of overt conflicts. This difference in context was reflected in the results reported by Steele et al. (2017). The authors found that another adaptive emotion regulation strategy, reflection, reduced bias and anger toward Muslims only after an intense intergroup threat (The Boston Marathon bombing), but not before. A possibility is that none of the out-groups in our study constituted in a current significant threat, which would elicit stronger negative emotions and be attenuated by regulatory efforts. A related possibility is that individuals experiencing less negative emotions are better able to use adaptive strategies like cognitive reappraisal.

A last point to highlight is that habitual emotion regulation can show variation over time, so that emotion regulation tends to become increasingly adaptive with age (Gross et al. 2006).

Future studies should provide longitudinal data on emotion regulation and out-group attitudes to assess the stability of the reported associations.

Exploratory Analyses

Partly reflecting our main results about the use of expressive suppression and acceptance of out-groups, the exploratory findings suggested that a greater level of habitual cognitive reappraisal (relative to habitual expressive suppression) was positively associated with higher acceptance of out-groups. It is possible that greater acceptance toward out-groups emerges in the Finnish context after a certain threshold, that is, when the level of cognitive reappraisal is markedly higher than the normative level of cognitive reappraisal and the level of expressive suppression. This preliminary finding highlights the importance of studying emotion regulation strategies in relation to each other, as discussed for example by Bonanno and Burton (2013).

To further extend our understanding about the results on emotion regulation and the acceptance of out-groups, we performed a third exploratory analysis focusing on the role of emotion regulation on the acceptance of different sub-groups. A few indications emerged. The use of expressive suppression predicted negative attitudes toward internal differing groups and toward ethnic groups, but not toward antinormative, crime-associated or privileged groups. One plausible explanation to this finding could be the level of perceived threat. Cottrell and Neuberg (2005) found that the respondents perceived different out-groups threatening in a varying degree and the threat perception elicited functionally associated emotions. It is possible that the threat perception of ethnic and internal differing groups elicit a kind of aversive emotions that are less likely to be successfully regulated by individuals with a high degree of habitual suppression. Future studies should address the possible role of different levels of threat and compare the effects of emotion regulation strategies on the acceptance of different categories of out-groups.

The results of the current study highlight the potential of interventions targeting emotional processes in creating preventive programs and interventions that aim to decrease intergroup hostility. Such programs could be for example anti-prejudice programs in schools or interventions against intergroup violence in prisons. The programs could offer psychoeducation about the role of emotions in hostile out-group attitudes and training on adaptive emotion regulation strategies.

Limitations

There are several limitations in the present study that warrant discussion. The response rate was low. This may partly be due to the fact that no reminder letters were sent. Further, it is possible that some systematic factors were associated with participation, which increases the risk for a biased sample. The final sample did not, however, differ markedly from the population on the whole (OECD 2013; Statistics Finland 2017). The sample consists somewhat more of women (around +7%) than the overall population, and it is more educated (8–10% differences, depending on education level; OECD 2013). The largest percentual differences in age groups in the sample compared to the general population is around 5%.

The survey was completed online, which limited our control over the testing situation. The emotion regulation and the attitudes toward out-groups were measured with self-report, and are vulnerable to desirability bias. Measurement bias may also be an issue regarding the measures on explicit emotion regulation. Accurate self-report of emotion regulation –and likely the emotion regulation skills themselves – requires introspective and metacognitive abilities. There may be significant variation in such abilities among the participants. The current study should, therefore, be replicated using objective measures of emotion regulation, such as physiological measures.

As previously mentioned, appraisals can be affected by several non-affective factors (Halperin et al. 2011), which were not thoroughly assessed in our study. Cultural factors could affect for example agency appraisals. In a study by Imada and Ellsworth (2011), people from an individualistic culture were more likely to credit successes to themselves and blame external factors for failures, whereas the tendency for a person from a collectivistic culture was the opposite. Situational factors such as how motivationally relevant the situation is to the person (Smith and; Kirby 2011) also affect interpretations. Intersectionality is also relevant, e.g. if people interpret that they are treated differentially based on one or several of their social identities (Wang et al. 2011). Further influencing factors are personality factors such as level of authoritarianism, and socio-economic status (Halperin et al. 2011), which for example may influence how threatening a person appraises a situation.

Lastly, a number of variables, which might influence the outcome variables such as the familiarity and closeness to representatives of the included out-groups, were not assessed in the current study. There is also a possibility of hypothesis guessing, i.e. that the participants may have guessed the intent of the study and altered their responding accordingly. Relatedly, the study did not include a measure on socially desirable responding. It still needs to be tested how such variables might modulate the associations found in the present study.

Conclusion

Increased use of expressive suppression was associated with decreased acceptance of out-groups. Emotion dysregulation

and cognitive reappraisal were not associated with attitudes toward out-groups, although after multiple imputation, an association between emotion dysregulation and out-group attitudes emerged. We found some preliminary indications for that relatively high cognitive reappraisal (over expressive suppression) was positively associated with acceptance of out-groups. This should be further tested in future studies. By highlighting the role of emotional components in overall intergroup attitudes, the results of the present study are applicable in programs aiming to increase intergroup acceptance and in clinical settings, for example in interventions with individuals who have engaged in intergroup conflicts.

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Compliance with Ethical Standards

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Regulating emotions under exposure to negative out-group-related news material results in increased acceptance of out-groups

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ABSTRACT

Negative emotions affect the acceptance of out-groups. Here, we investigated whether modifying negative emotions would affect perceptions of out-groups. We experimentally manipulated the use of two emotion regulation strategies: suppression of emotional expression and cognitive reappraisal, the latter involving reframing a situation to mitigate its emotional impact. Using a population-based sample (N = 317), we conducted an online randomized controlled trial. Participants regulated their emotions while reading threatening news about out-groups. Not only reappraisal, but also suppression increased immediate acceptance of out-groups. The effect of reappraisal was partly mediated by decreased disgust, suggesting unique effects of reappraisal on this emotion. In the suppression condition acceptance decreased at high levels of habitual emotion regulation, whereas reappraisal showed an opposite tendency. Previous research may have underestimated the importance of different emotion regulation strategies on prejudice, and that relatively simple interventions can affect prejudice. The findings are of interest to prejudice prevention programs.

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The social groups individuals belong to determine a part of their identity (as described in the social identity theory, Tajfel & Turner, 1979, and the self-categorization theory, Turner, 1987). Because of their group membership, individuals produce group-level appraisals of their surroundings, and, in turn, these appraisals generate emotions. An influential theory that focuses on these emotional consequences of social identity is the Intergroup Emotions Theory (Mackie, Devos, & Smith, 2000). It posits that when individuals identify with a group, they appraise stimuli and experience emotions with respect to their group membership (Miller, Smith, & Mackie, 2004). For example, when an out-group gains resources that are perceived to belong to the in-group, or when an out-group member breaks social norms, the members of the in-group are likely to react with anger (Cottrell & Neuberg, 2005). If an out-group is perceived as a threat to the in-group's physical safety, the resulting emotion can be fear (Mackie & Smith, 1998). A third example is disgust, which has a survival-related function of protecting the individuals and their in-groups by serving as a signal about possible pathogens. The disgust response is sensitive to a broad set of clues of pathogen-infection (from rotten food to certain behaviors and other people), all of which are not likely to pose an actual threat (Schaller & Park, 2011).

In sum, the appraisal of situations in relation to their meaning for the individual's in-group influences the resulting emotional reactions and, further, the action tendencies such as discriminatory behavior. The emerging intergroup emotions have indeed shown to be predictors of attitudes and behaviors toward out-groups (Smith, Seger, & Mackie, 2007). For example, the induction of

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Supplemental data for this article can be accessed on the publisher's website.

disgust has been found to make participants view homosexual men more negatively, underlining the role of disgust in social judgment (Inbar, Pizarro, & Bloom, 2012). Disgust can also add to prejudice against groups whose physical appearance is perceived as anomalous as a reaction to perceived threat of infection (Schaller & Park, 2011). Also anger may contribute to negative attitudes and prejudice toward the out-group (Miller et al., 2004) and it has been found to be negatively associated with conciliatory and positively with vengeful policies toward out-groups (Lerner, Gonzalez, Small, & Fischhoff, 2003). Fear can increase political intolerance and in-group favoritism (Skitka, Bauman, & Mullen, 2004). Further, the negative attitudes may also transfer to other out-groups than those directly associated with the threat (Bouman, van Zomeren, & Otten, 2015) and incidental affects can influence attitudes toward situationally unrelated out-groups (discussed in Bodenhausen, Mussweiler, Gabriel & Moreno, 2001).

Emotion regulation and intergroup attitudes

Since threats and the negative emotions that follow can increase prejudice toward out-groups, we aimed to investigate if actively decreasing these negative emotions would lead to a decrease in prejudice against out-groups presented as threatening. The variation in the extent that individuals experience negative and positive emotions is related to *emotion regulation*, the process by which individuals modulate what emotions they feel, when they feel them, and how they experience and express them (Gross, 1998b). Failure to control emotional cues, experiences, and verbal, expressive, or behavioral responses in normal settings is referred to as emotion dysregulation (Linehan, Bohus, & Lynch, 2007). In the literature, much interest has been placed on two specific emotion regulation strategies: *expressive suppression* which refers to inhibition of the expression of emotions, and *cognitive reappraisal* which involves generating different perspectives or reinterpreting the meaning of an emotion-eliciting situation in order to change its affective impact (Gross, 1998b). Reappraisal can take different qualitative forms such as *positive reappraisal*, where the individual focuses on the positive aspects of the situation in order to increase positive affect (Shiota & Levenson, 2012) and *detached reappraisal*, where the individual assumes a neutral, distanced and uninvolved approach to the stimuli in order to reduce their subjective relevance (Dörfel et al., 2014). In fact, self-distance has been found to reduce aggressive emotions (Mischkowski, Kross, & Bushman, 2012).

Previous research has shown that, compared to those who tend to suppress emotions, individuals who rely more on cognitive reappraisal strategies for emotion regulation exhibit less negative emotions and higher level of social functioning (Gross & John, 2003), although for example stress may hamper the ability to cognitively regulate emotions (Raio, Orederu, Palazzolo, Shurick, & Phelps, 2013). Expressive suppression again is associated with decreased positive and increased or unchanged negative affect (Butler et al., 2003; Campbell-Sills & Barlow, 2007; Gross, 1998a), increased sympathetic activation (Gross, 1998a) and aggression (Tull, Jakupcak, Paulson, & Gratz, 2007). Attempts to prevent emotion expression may hence enhance internal negative arousal and the aversive emotional state and paradoxically increase aggression (Tull et al., 2007). This negative emotional state may affect subsequent appraisals (discussed in Bodenhausen, Mussweiler, Gabriel & Moreno, 2001), for example about out-groups.

Returning to emotions and out-group attitudes, we hypothesized that downregulating the negative emotions that arise after intergroup threats could lead to a decrease in prejudice toward the out-groups. Previous correlational studies have showed that emotion regulation is indeed associated with attitudes toward out-groups. For example, in a previous study (Westerlund, Antfolk & Santtila, in press) using a Finnish population-based sample, we found that the use of suppression was associated with decreased acceptance of out-groups in general. Roth, Shane, and Kanat-Maymon (2016) found that integrative emotion regulation, defined as the ability to experience and explore reasons for negative emotions, and regulate emotions based on this information, mediated by the ability to empathize with others, predicted Israelis' support for conciliatory policies toward Palestinians. Halperin, Pliskin, Saguy, Liberman, and Gross (2014) found a negative correlation between political intolerance and the use of cognitive reappraisal in Israeli citizens. The authors also found support for a causal effect for reappraisal decreasing negative emotion and political intolerance, with indications that the effect was moderated by political

orientation. This is in line with previous research linking political ideology to attitudes toward out-groups (Duckitt & Sibley, 2007). Importantly, political ideology can influence the individual's appraisal of events, which again affects the emotional reaction and, consequently, the related action tendencies (Miller, 2011). To recapitulate, the correlational results indicate that emotion regulation strategies, and cognitive reappraisal in particular, are associated with decreased negative intergroup emotions and attitudes.

Some other studies have also found evidence on the causal effects of emotion regulation on out-group attitudes by directly manipulating emotion regulation strategies. Halperin, Porat, Tamir, and Gross (2013) found that the use of cognitive reappraisal decreased the level of anger Israeli participants felt toward Palestinian citizens as well as their support for aggressive policies toward Palestinians, and these effects were maintained at a 5-month follow-up. Similar results were reported by Alkoby, Halperin, Tarrasch, and Levit-Binnun (2017) who found that mindfulness and cognitive reappraisal both individually and combined increased the support for compromise in the Israeli-Palestinian conflict. This effect was mediated by reduced negative affect against Palestinians.

In sum, previous research supports the notion that emotions and regulation of emotion processes have an impact on intergroup attitudes. Most evidence currently exists for cognitive reappraisal, showing it can decrease negative emotions toward out-groups. The majority of previous research on the topic has been conducted in conflict-settings, but there are also some results from peaceful settings. This led us to ask whether regulating emotions after exposure to common threatening information could influence the attitudes and prejudice toward out-groups in normative situations – a highly topical question given the increased political polarization in Europe (Groskopf, 2016).

The current study

We examined whether emotion regulation strategies have a causal effect on out-group attitudes after presentation of real news material involving different out-groups that can be perceived as threatening to the majority in-group's economical resources, physical wellbeing and safety. We chose to use authentic news articles to ensure the ecological validity of the stimuli.

Based on previous results, we formulated the following hypotheses:

(1) Using cognitive reappraisal to regulate the emotions elicited by material that potentially activates negative emotions toward out-groups will result in less prejudice toward the outgroups (both those targeted by the stimulus material and others) compared to suppression of emotional expression and the control condition.
(2) The prejudice reduction is mediated via reductions in the aversive emotions of anger, anxiety, fear and disgust, as well as arousal, which is closely associated with fear and anxiety.
(3) We expected the effects of the emotional regulation strategies to be moderated by habitual emotion regulation and political ideology. We expected habitual emotion regulation to have a facilitating effect on the participants' ability to employ the instructed experimental emotion regulation strategy.

Method

Ethical permission

The study plan was approved by the Board for Research Ethics at Åbo Akademi University .

Participants

We sent invitation letters to a population-based, random sample of 5000 18-64-year-old Finnish-speaking individuals residing in Finland. The sample was drawn from the Finnish Population Register Center, which holds the addresses of all people currently living in Finland. Invitees were randomly assigned to either the reappraisal condition (2000 individuals), suppression condition (2000 individuals) and control condition (1000 individuals). In total, 349 (186 women) individuals completed the whole assessment.

Measures

Left-right ideology

To report the participants' political ideology between left and right, we asked them to use a scale from 0 (most left) to 10 (most right).

Stress measure

We included a one-item stress measure which has shown satisfactory validity in different Finnish samples (Elo, Leppänen, & Jahkola, 2003). The question briefly describes common stress symptoms and asks whether the person feels that kind of stress lately. The responses are given on a 5-point Likert scale ("not at all" to "very much").

Emotion Regulation Questionnaire

The Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) is a 10-item scale that was designed to measure the habitual use of two specific emotion regulation strategies, cognitive reappraisal and expressive suppression. The answers are recorded using a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree). The scale has been validated in different contexts, including American (Gross & John, 2003), German (Wiltink et al., 2011) and Swedish (Enebrink, Björnsdotter & Ghaderi, 2013). We used a Finnish translation of the scale (Vuorela & Nummenmaa, 2004) from the Stanford Psychophysiology Lab Resources web site (https://spl.stanford.edu/resources).

Difficulties in Emotion Regulation Scale-16

The Difficulties in Emotion Regulation Scale-16 (DERS-16; Bjureberg et al., 2016) is a short form of the 36-item DERS originally developed by Gratz and Roemer (2004). DERS-16 has five of the original DERS' six latent factors: Nonacceptance of Emotional Responses, Difficulties Engaging in Goal-Directed Behavior, Impulse Control Difficulties, Limited Access to Emotion Regulation Strategies, and Lack of Emotional Clarity (Bjureberg et al., 2016; Gratz & Roemer, 2004). The answers are reported using a 5-point scale from 1 (almost never) to 5 (almost always). DERS-16 has shown to have adequate psychometric properties (Bjureberg et al., 2016). The translation of the DERS-16 was compiled from an existing Finnish translation of the original DERS (Tapola, Lappalainen, & Wahlström, 2010).

Self-Assessment Manikin

The Self-Assessment Manikin (SAM; Lang, 1980; Bradley & Lang, 1994) was used to measure the amount of arousal elicited by each article. SAM is a nonverbal instrument with figures depicting a 9-point range of each of the affective dimensions (happy-unhappy, calm-aroused, and inferior-dominant). Earlier studies have found the SAM to possess adequate psychometric qualities (Bradley & Lang, 1994). In our study, the Cronbach's α for the SAM were good to excellent (valence α = .87, dominance α = .92, arousal α = .83).

Verbal emotions

The participants were asked to indicate on a 7-point Likert-type scale how much of the emotions sadness, pleasure, anger, disgust, anxiety, fear and joy they felt (1 = *not at all* to 7 = *very much*).

Acceptance of out-groups

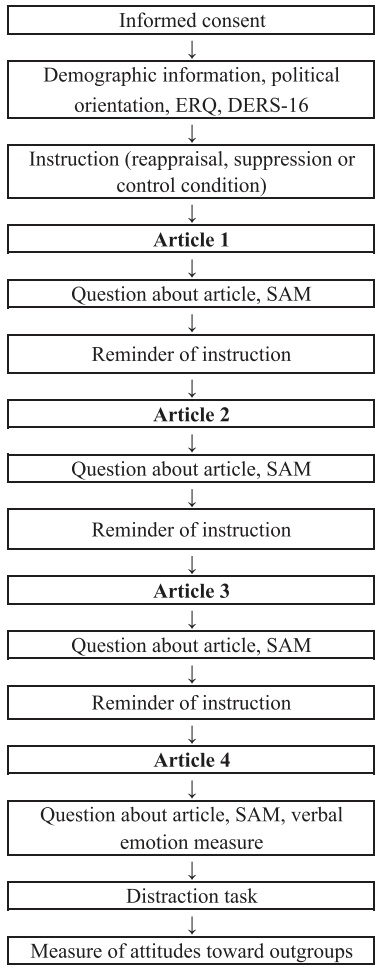
Finland overall is ethnically, religiously and linguistically fairly homogenous (Official Statistics of Finland, 2019 ; Patsiurko, Campbell, & Hall, 2012). We asked the participants to report their general views (from 1 = *very negative* to 7 = *very positive*) on the target out-groups that were represented by the newspaper articles (migrants from the Middle East and Africa, persons with high income, Russians, and mental health patients) and other out-groups (atheists, Christians, Jews, Muslims, right-wingers, feminists, left-wingers, Sami people, Finland-Swedes, Finland's Roma people, Romanian beggars, persons living on disability pension, housewives, the unemployed, gay persons, transgender persons, people with physical disability, elderly, sex workers, obese persons, and persons with substance use disorder) to assess whether the effect transferred to unrelated groups. For the other out-groups, we chose groups that would likely represent different levels of threat, and cover the groups that have been reported to experience prejudice in Finland (Korhonen, Jauhola, Oosi, & Huttunen, 2016). Lastly, participants were asked to report which of the out-groups they identified with themselves.

Procedure

The invitation letter to the study contained a link to the experimental condition-specific online survey. The informed consent page described generally the study procedure and the voluntary nature of the study, the data handling, and stated that the purpose was to assess "opinions about societal phenomena and ways to manage common emotional reactions". The text contained a bolded warning text stating that some of the newspaper articles describe violence, threat of violence, and mention sexual violence, which some readers could find distressing. The study procedures are outlined in a flow chart (Table 1).

For the news article task, the participants read instructions according to their experimental condition: the cognitive reappraisal, the expressive suppression and the control condition. As mentioned, there are different qualitative variations of cognitive reappraisal, and we chose to use detached reappraisal rather than positive reappraisal due to the nature of the articles; it would have likely been challenging for the participants to reappraise the topics (e.g., child sexual abuse, manslaughter) in positive terms. Detached reappraisal implies increasing one's psychological distance from the emotion-eliciting aspects by taking an objective, technical, third person perspective (Ochsner, Silvers, & Buhle, 2012). The instructions were modified based on the instructions used by Richards and Gross (2000) and Halperin et al. (2014) (see Supplemental material 1). All instructions contained a reminder about the sensitive content of the articles. At the end of the instructions page, we asked the participants to check a specific box in order to express that they had read and understood the instructions. After each article, the participants saw shortened, brief reminders of their specific instructions. The participants also answered a question about what happened in the article, as well as the SAM ratings. After the last article, the participants answered the verbal emotion measure. Next, the participants completed a short distraction task, where they were instructed to search for about 10 seconds for words of different professions in a box filled with otherwise random letters. Then the participants indicated their attitudes toward a list of out-groups. Lastly, the participants could participate in a lottery for a cinema ticket and they saw an acknowledgment, contact information and a description of a short breathing exercise in case the assessment had provoked strong emotions in them.

Table 1. Flow chart over the study procedures.



Note: ERQ = Emotion Regulation Questionnaire. DERS-16 = Difficulites in Equation Regulation Scale-16.
The articles were presented in different orders, see Methods section.

Stimulus materials

To assure the ecological validity of the stimulus material, we chose to use real newspaper articles depicting threatening out-group related topics. The trust in mainstream media and newspapers is high in Finland (Newman, Fletcher, Kalogeropoulos, Levy, & Kleis Nielsen, 2018). The articles were published in Finnish printed and online media between 2011 and 2016. The articles covered emotion-inducing topics and tapped a broad array of distinct threats: (1) a psychiatric patient killing a war veteran, (2) increasing income differences, (3) child sexual abuse perpetrated by an asylum seeker, and (4) two political scientists opinion of a probable Russian invasion of Finland. We compressed, and anonymized the articles, and slightly modified the wording to increase their emotional impact. The articles appeared in four different orders as determined by a 4 × 4 Latin square design.

In a pilot study, we tested the stimulus articles against four neutral articles for valence and strength of emotional impact. The neutral articles covered the cultivation of tulips, traditional Finnish rugs, overnight changes in weather, and an archeological excavation searching for evidence of historic farming under the Finnish National Road 5. The participants (N= 41) for the pilot study were recruited through student and staff intranet sites of a university, and a Health and Wellbeing Faculty of a University of Applied Sciences. There was a significant difference between the mean score of negative emotions elicited by the neutral articles (M= 1.06, SD = 0.14) compared with the negative emotions elicited by the valenced articles (M= 3.42, SD = 1.13), $t(40)$ = 13.61, p< .001, d = 2.94, on a scale from 1 to 7, with 7 indicating the highest level of negative emotions.

Statistical analysis

Preliminary data treatment

All statistical analyzes were conducted using SPSS 24.0. The scoring of ERQ and DERS-16 is described in Westerlund and Santtila (2018). Participants who did not check the correct box to express that they had read the instructions were removed from all further analyses. This resulted in 317 participants. Due to a technical error in the measure for political ideology, the option number 6 was omitted from the scale in the survey. We managed this by changing the scale from a 10-point scale to a 9-point scale, by replacing the values 10, 9, 8 and 7 with 9, 8, 7 and 6, respectively. Before the analyses, we confirmed that the assumptions of the linear model were met. (Field, 2013).

Descriptive analysis and hypotheses tests

We calculated frequencies on the demographic variables. To protect against Type I error due to multiple tests we used t-tests with a Bonferroni-corrected p-level of .01 to compare the emotional responses (SAM arousal and verbal measure) between both experimental groups and the control group.

To test our first hypothesis, we used an ANOVA to compare the means in the attitudes toward target and non-target out-groups between all experimental groups. We used t-tests to compare both experimental groups with the control group. As these analyses were post hoc analyses after a general effect we considered a p-level of < .05 significant. Lastly, we used PROCESS macro for SPSS (Hayes, 2018) to assess whether self-identification with the out-groups affected the main effect.

Prior to the mediation analysis to assess the second hypothesis, we inspected the leverage, Cook's distance, Mahalanobis distances, standardized DFBeta, and standardized residuals; 15 cases (5%) showed residuals above 2, and two cases above 3. Using the PROCESS macro for SPSS (Hayes, 2018), we conducted a mediation analysis with the experimental groups as independent, categorical variables coded into dummy variables with the control group as reference category (Hayes, 2018; Hayes & Preacher, 2014). The path from the predictor variable (experimental condition), via the mediator (emotion) to the outcome variable (acceptance of out-groups) quantifies the difference in the outcome between the experimental group (reappraisal or suppression) and the control group on the mediator, which then affects the outcome (*relative indirect effects*). Similarly, the *relative direct effects* quantify the effect of the predictor on the outcome (Hayes, 2018). We used 1000 bootstrapped iterations to produce bias-corrected 95% confidence intervals. We assessed the independency of residuals using the Durbin-Watson test (Durbin & Watson, 1951), and we assessed for multicollinearity.

For the third hypothesis we again used the PROCESS macro (Hayes, 2018), models 1 and 2, and the moderators were centered prior to the analyses.

Results

Descriptive analyses

Demographic information is presented in Table 2. We assessed the associations between the measures of emotion regulation (see Table 3).

Table 2. Demographic information.

	Final sample
	n (%)
Gender	
Female	170 (53.6)
Male	147 (46.4)
Age (years)	
18-29	78 (24.6)
30-39	59 (18.6)
40-49	59 (18.6)
50-59	72 (22.7)
above 60	49 (15.5)
Highest level of education	
Primary school	22 (6.9)
High school	46 (14.5)
Vocational upper secondary	63 (19.9)
B.A./Polytechnic	115 (36.3)
Master's degree or above	71 (22.4)
Political inclination	
Left 0	8 (2.5)
1	9 (2.8)
2	23 (7.3)
3	42 (13.2)
4	40 (12.6)
5*	76 (24.0)
7	40 (12.6)
8	56 (17.7)
9	17 (5.4)
Right 10	6 (1.9)

*Due to a technical error, option nr. 6 was omitted from the survey (see Methods section)

Table 3. Means and standard deviations of the measures used prior to the manipulation, and correlations among emotion regulation measures and stress.

	M	SD	1	2	3	4	5
1. ERQ-Reappraisal	4.59	1.0		**.15 (.006)**	-.015 (.796)	-.04 (.466)	.02 (.689)
2. ERQ-Suppression	3.29	1.27			**.22 (<.001)**	**.17 (.002)**	.14 (.013)
3. DERS-16	26.17	8.71				**.42 (<.001)**	-.11 (.057)
4. Stress	2.74	0.86					-.05 (.373)
5. Political ideology	4.87	2.01					

Note. ERQ = Emotion Regulation Questionnaire. DERS-16 = Difficulties in Emotion Regulation Scale-16.

Emotion measures

Next, we tested if the groups differed in the amounts of anger, anxiety, fear, disgust, and arousal. For the SAM arousal subscale, the reappraisal group did not differ from the control group (M = 3.81, SE = 0.13; mean difference −0.24, BCa 95% CI [−0.66, 0.19], t[202] = − 1.10, p = .272, d = .08) or from the suppression group (M = 3.81, SE = 0.15; mean difference −0.24, BCa 95% CI [0.70, 0.22], t[181] = 1.01, p = .314, d = .07).

For the verbal emotions, participants who received no instructions to regulate their emotions had significantly higher levels of anger (M = 3.11, SE = 0.20) than those who were instructed to reappraise their emotions (M = 2.49, SE = 0.12; mean difference 0.63, BCa 95% CI [0.17, 1.10], t[121.41] = 2.70, p = .008, d = .37), with a p-level of .01. Similar results were found for disgust between the reappraisal (M = 2.32, SE = 0.13) and control group (M = 2.94, SE = 0.21; mean

difference 0.62, BCa 95% CI [0.13, 1.11], t[120.24] = 2.51, p = .014, d = .38), but the association did not reach the Bonferroni-corrected significance level.

The results for the suppression group were in the same direction. Suppressing emotions resulted in lower anger (M = 2.65, SE = 0.16) compared to the control group (M = 2.94, SE = 0.21), but the difference was not statistically significant (mean difference 0.47, BCa 95% CI [−0.01, 0.95], t[181] = 1.86, p < .066, d = .28). Similarly, the difference for disgust (M = 2.59, SE = 0.16) was not statistically significant (mean difference 0.35, BCa 95% CI [−0.14, 0.85], t[181] = 1.33, p < .195, d = .20).

Hypothesis testing

According to our first hypothesis, the reappraisal group would express less negative attitudes toward out-groups (both groups that were targeted and not targeted in the articles) compared to the other conditions. There was a significant effect of the emotion regulation manipulation on acceptance of targeted out-groups, F(2, 314) = 7.80, p < .000, ω^2 = .04. The reappraisal group (M = 3.88, SE = 0.07) reported higher acceptance scores for target out-groups compared to the control group (M = 3.62, SE = 0.07; mean difference −0.25, BCa 95% CI [−0.48, −0.02], t[202] = − 2.18, p = .030, d = 0.37). The suppression group also reported higher acceptance scores (M = 4.11, SE = 0.08) compared to the control group, and the difference was significant and medium sized (mean difference −0.49, BCa 95% CI [−0.72, −0.25], t[168.51] = − 4.13, p < .001, d = 0.69). We did not find evidence for self-identification moderating the main effect, p = .793.

To assess whether the effect of the manipulation would also transfer to non-targeted outgroups, we reran the analysis using the acceptance toward other out-groups than those targeted in the articles as outcome variable. We found that the experimental condition did affect the acceptance scores, F (2, 314) = 3.58, p = .029, ω^2 = .02. Again, the reappraisal group (M = 4.36, SE = 0.06) reported higher acceptance scores compared to the control group, but the difference was not statistically significant (M = 4.18, SE = 0.07; mean difference −0.18, BCa 95% CI [−0.38, 0.02], t[202] = − 1.76, p = .080, d = 0.30). The suppression group reported significantly higher acceptance scores (M = 4.46, SE = 0.07) compared to the control group, and the difference was significant (mean difference −0.28, BCa 95% CI [−0.48, −0.08], t[181] = − 2.76, p = .006, d = 0.46). Self-identification with the out-groups did not influence this relationship (p = .599).

Next, to test our second hypothesis, we assessed whether the effect of the experimental condition on the acceptance of target out-groups was mediated by the negative emotions elicited by the articles. We used anger and disgust as our target emotions, as these differed more than the other emotions between the control and emotion regulation conditions.

Mediation through anger

There was no statistically significant indirect effect on target outgroup acceptance through anger of either suppression (b = 0.03, 95% BCa CI [−0.01, 0.09]) or reappraisal (b = 0.03, 95% BCa CI [−0.00, 0.11]) in relation to the control group.

Mediation through disgust

We found some support for an indirect effect on acceptance of target out-groups, mediated via disgust, for reappraisal in relation to the control group (b = 0.04, 95% BCa CI [0.00, 0.10]), but not for suppression in relation to the control (b = 0.02, 95% BCa CI [−0.01, 0.07]).

We also found some support for direct effects of anger and disgust on acceptance of target outgroups, (b = − 0.06, 95% BCa CI [−0.12, −0.00]) and (b = − 0.07, 95% BCa CI [−0.12, −0.01]), respectively.

Next, we turned to our third hypothesis. We assessed whether the acceptance of target out-groups was, apart from experimental condition, further predicted by habitual reappraisal and suppression, emotion dysregulation, and political inclination, or interactions between experimental condition and these factors. We did not find support for that these factors alone, or in interaction with the experimental

condition, significantly moderated the effect of the experimental condition on the acceptance toward target out-groups. Similarly, political ideology did not moderate the effect (Supplemental material 2).

Explorative analyses

We decided to inspect the simple slopes in order to explore differences in the values for out-group acceptance for the three experimental conditions when the value of the moderator was equivalent to the mean, and one standard deviation above and below the mean. In the suppression and control groups, low levels of habitual suppression seemed to increase out-groups acceptance, whereas high levels decreased it. High habitual reappraisal seemed to increase acceptance, and low habitual reappraisal decreased it. For the reappraisal experimental condition, the tendencies for habitual suppression were the opposite; low habitual suppression decreased acceptance and high levels increased it.

Discussion

We conducted an online experiment about the effect of cognitive reappraisal and suppression compared to a control condition on attitudes toward out-groups after exposure to threatening news material. There were differences in the levels of anger and disgust between the reappraisal group and the control condition, although the significance in the difference for disgust did not withstand a Bonferroni-correction.

We expected that the experimental groups would also differ in the amount of fear, anxiety and arousal, but found no differences. This is a cause for deliberation. First, the topic of one of the articles was child sexual abuse, which is likely to elicit anger and disgust (Russell & Giner-Sorolla, 2013). In the pilot study and the current study this article was rated as eliciting more anger and disgust than the other articles. It may be that the participants experienced these emotions at a greater intensity than other emotions. Another plausible explanation is that some emotions may be more difficult to regulate than others. For example, a meta-analysis by Webb, Miles, and Sheeran (2012) showed that the type of emotion moderated the effectiveness of emotion regulation strategies. Of negative emotions, sadness (but not anxiety, disgust or anger) positively moderated the effectiveness of the strategies. The authors suggest this may be because sadness is experienced more often than the other emotions and therefore individuals may be more accustomed to regulate it. In our sample, the emotion regulation strategies may have facilitated the regulation of anger and disgust specifically, perhaps because participants are less exposed to those emotions and hence not habitually able to regulate them as effectively. We suggest that the group that received no instructions to regulate emotions had to rely on automatic, habitual regulatory strategies, which were not as effective as the instructed strategies. One factor worth considering relates to the emotion measures themselves. Participants may be more accustomed to identify higher-order emotions and describe their emotions using verbal than non-verbal measures such as SAM.

The effect of emotion regulation strategy on acceptance toward out-groups

We found partial support for our first hypothesis. As we predicted, using cognitive reappraisal did result in higher target out-group acceptance compared to the control condition. Surprisingly, the suppression condition also showed significantly higher target out-group acceptance than the control condition, and, additionally, somewhat higher acceptance scores than the reappraisal group. Since previous research (Gross & John, 2003) has found that reappraisal is generally an effective strategy in reducing negative emotions, and results on suppression have been the opposite, we predicted that the reappraisal condition would exhibit the highest out-group acceptance scores. On the other hand, previous research about the effect of emotion regulation strategies on out-group attitudes has mainly focused on reappraisal, whereby data on suppression are limited.

We propose that our finding can be explained with temporal aspects. As theories of threat and defense (reviewed in Jonas et al., 2014; Tritt, Inzlicht, & Harmon-Jones, 2012) posit, when

individuals are faced with a threat, they first employ proximal defenses. These are inhibitory in nature and immediately suppress threat-related thoughts from awareness. After a delay, the proximal defenses subside and distal defenses emerge, which involve stronger commitment, for example, to groups, goals and cultural worldview, the latter of which has been associated with decreased acceptance of out-groups (Tritt et al., 2012). Due to this delay, we employed an approximately 10-second distraction task between the news material and the main outcome measure. However, it is possible that the delay was too short in order for distal defenses to emerge. Support for this possibility comes from earlier research on threat compensation. Although recently generalized, biologically based systems of threat and defense have been proposed (Jonas et al., 2014; Tritt et al., 2012), much research on distal defenses has been conducted using a specific theory under the umbrella of generalized theories of threat and defense, namely the Terror Management Theory (TMT, Greenberg, Solomon, & Pyszczynski, 1997). This theory posits that the anxiety that results from threatening reminders of one's own mortality is buffered by enhancing one's cultural world-view and in-group. A meta-analysis (Steinman & Updegraff, 2015) on TMT showed larger effect sizes for studies that used longer delays between presenting death-related stimuli and measuring death-thought accessibility (the latter is suggested to cause cultural worldview defense; Greenberg et al., 1997). Relatedly, earlier results on TMT also indicate that reappraisal can decrease the negative emotions triggered by a threat and, as a result, limit the processes leading to worldview defense (Webber et al., 2014). The suppression group, due to relatively higher negative affect, may have experienced the proximal defenses at the time of measuring acceptance of out-groups. Nevertheless, before any conclusions can be drawn, more tests need to be conducted where the delay between stimuli and outcome assessment is longer. We also found indications for that the effect of the manipulation transferred to non-targeted out-groups. This is in line with earlier results showing that angry mood is associated with increased stereotyping (Bodenhausen, Sheppard, & Kramer, 1994). Another possible interpretation of our results is that merely being instructed to pay attention to one's emotional processes can result in increased acceptance toward outgroups. This would be in line with results showing that focusing on one's feelings prevents the emotions' biasing effect on forming impressions of others (McFarland, White, & Newth, 2003).

Mediation of the emotion regulation effect

In our second hypothesis, we further predicted that the reappraisal strategy's reduction of negative attitudes toward out-groups would be mediated via aversive emotions resulting from the stimulus material. We found only limited support for this: The only significant indirect effect of emotion regulation, mediated via disgust, was found for the reappraisal group in the acceptance of target out-groups. Previous research has found results in the same direction; Matsumoto, Hwang, and Frank (2017) found that inducing a combination of anger, contempt and disgust increased hostility toward already disliked out-groups. The authors suggested that a likely explanation was that the negative affects activated preexisting hostile cognitions toward the specific out-group. Results from our earlier Finnish population-based association study (Westerlund, Antfolk & Santtila, in press) provides support for this. We assessed the unmanipulated attitudes toward various minorities and found that the acceptance toward some of the groups that were included as target out-groups in the current study was relatively low. Given this, we propose that our results reflect on a unique effect of cognitive reappraisal on disgust. Similar results were reported by Feinberg, Antonenko, Willer, Horberg, and John (2014) who found a unique (negative) association between the tendency to reappraise disgust and conservatism, but no association between suppression of disgust and conservatism. This too reflects our results, which show no support for an indirect association between suppression, disgust and negative attitudes toward out-groups. When assessing direct effects, we found that negative acceptance of target out-groups was decreased by anger and disgust, again reflecting earlier literature.

Taken together, the effect of the emotion regulation strategies does not seem to operate via our chosen emotion measures. It may be that the emotions triggered by the stimulus material were affecting the participants on an implicit level, which may not have been adequately captured by the current explicit measures used. Tritt et al. (2012) suggested that when facing threats, an avoidance motivational state and, for example, the cultural worldview defense may be automatically employed in order to restore psychological homeostasis – so quickly that people may not be aware of their affective reactions on the threat. The authors further suggested that self-report measures may not be sensitive and fast enough to capture these affective changes, which may also have occurred in our study.

Moderation by habitual emotion regulation and political ideology

We did not find support for our third hypothesis, that habitual use of expressive suppression or cognitive reappraisal, emotion dysregulation, or political attitudes moderated the effects of the experimental manipulation. Since habitual emotion regulation did not predict attitudes toward target out-groups, we suggest that the intervention may at least momentarily supersede the effect of habitual emotion regulation. On the other hand, the simple slopes revealed certain patterns. For the control and suppression groups, the acceptance toward out-groups seemed to increase at low levels of both habitual reappraisal and suppression, and to decrease at high levels. In contrast, the reappraisal group showed an opposite, albeit weak, tendency. We suggest that these findings can be interpreted in the light of results from Dixon-Gordon, Aldao, and De Los Reyes (2015), which indicated that heightened use of a broad array of emotion regulation strategies was associated with increased symptoms of psychopathology. The authors propose that individuals with more psychopathology need more efforts to downregulate their psychological distress (Dixon-Gordon et al., 2015). Our results may reflect some components in the reappraisal strategy that help individuals with more dysfunctional trait emotion regulation to regulate emotions after exposure to negative stimuli, possibly in a similar way as reappraisal techniques can be used in psychotherapy to reduce aversive emotions (Goldin et al., 2012). Our results on this matter are, however, generally weak and need to be further examined before conclusions can be drawn.

Taken together, the results from the current study indicate that relatively simple interventions may have an effect on attitudes toward out-groups. This can have implications for both initiatives preventing prejudice, which have traditionally focused on other aspects of prejudice than the emotional ones. Further, the results may even be applied in clinical practice for example when working with individuals involved in intergroup aggression.

Limitations

Some methodological limitations should be considered when interpreting our results. The main limitation concerns the low response rate, which can indicate sampling bias and lower generalizability. Also, the content warning may have made some participants choose not to participate. Further, our study was conducted online, weakening our control over the testing situation compared with a laboratory setting.

Another possible limitation relates to the instructions: We chose to employ detached reappraisal rather than positive reappraisal. It is possible that positive reappraisal instructions would have affected the outcome. Some indication for this can be found in previous literature. For example Vescio, Sechrist, and Paolucci (2003), found that adopting an objective and detached perspective when listening to an interview with an out-group member resulted in less favorable attitudes toward that out-group, compared to taking the perspective of the out-group member. It is possible that positive reappraisal would, in theory, have resulted in less negative emotions and increased acceptance of out-groups. However, as mentioned, we chose to use stimulus material with high negative emotional impact, and we concluded that it would be challenging for the participants to reappraise the stimulus material in a positive light.

Another factor affecting our results may be the type of instructions provided. The reappraisal instructions were extended with concrete examples of questions the participant could consider in order to achieve a detached perspective. It is possible that the example questions steered the

participants' spontaneous reappraisal process excessively. They may even had led some participants to immerse themselves in the topics intellectually, which could have had an emotional effect. In addition, apart from prompting the participants to adopt a neutral, non-personal approach, the reappraisal instructions did not explicitly instruct the participants to change their emotions. It is likely that an emphasis on emotional modification could have decreased the negative emotions and affected the outcome measure.

Finally, we must consider the possibility of experimenter demand, i.e. that the experimental effect arouse because participants answered in a way they assumed the researchers expected. However, we believe this possibility is low given that all emotion measures were not affected similarily. Also, we believe it is unlikely that a data pattern allowing mediation would arise if the effect were due to experimenter effect. The question, however, could be addressed in replication studies, for example by using more covert outcome measures.

Conclusions and future directions

Suppressing and – to a lesser degree – reappraising emotions while consuming negative out-group-related news material resulted in more accepting immediate attitudes toward target out-groups compared to the control condition. This would imply that simply making the individuals aware of emotion processes could affect their attitudes toward out-groups. However, future studies should evaluate the effect of emotion regulation strategies on out-groups after longer delays in order to exclude the possibility of proximal defenses.

These results suggest that the strengths of negative emotions, and possibly preexisting negative emotions, may mediate the effect of the emotion regulation. Future studies should examine whether and how the effect of emotion regulation on out-group attitudes is dependent on the strength of negative emotional impact.

Disclosure statement

No potential conflict of interest was reported by the authors.

Data availability statement

The data described in this article are openly available in the Open Science Framework at https://osf.io/d4wns

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IV

Brief Emotion Regulation Strategies Affect Emotions Related to Reminders of a Terror Attack in the Affected Population

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Abstract

We conducted an online randomized controlled trial to test whether modifying emotional reactions when reminded of an actual terror attack affects attitudes toward out-groups perceived associated with the attack. The participants (N = 501) used cognitive reappraisal, expressive suppression, or mindful attention to regulate emotions during exposure to attack-related news material. The mindful attention condition reported most and the reappraisal condition least negative emotions. Out-group attitudes were not directly affected by the experimental condition, although there was an indirect effect via negative emotions in the reappraisal and mindful attention conditions. Posttraumatic symptoms correlated positively with negative emotions, and negatively with attitudes toward attack-associated out-groups. In addition, we discuss how the physical and psychological distance to the attack impacts the effects. The results suggest that emotion regulation strategies affect the emotions associated with terror attacks, but more robust interventions may be needed to modify attitudes toward attack-associated groups within contexts involving real terror attacks.

Keywords: Emotion Regulation, terrorism, cognitive reappraisal, expressive suppression, mindfulness, PTSD

Brief Emotion Regulation Strategies Affect Emotions Related to Reminders of a Terror Attack in the Affected Population

On the 18th of August 2017, a young man stabbed two people to death and injured eight others on the Central Square in Turku, Finland. The attack was investigated as the first recorded Islamist terror attack in the country. The individual sentenced for the crimes was an asylum seeker of Moroccan nationality. The incident received a lot of media attention (Parkkari, 2017) and some of the public reactions were strong and hostile towards immigrants in general (Langenoja, 2017). Previous research shows that terror attacks cause strong negative emotional reactions in the affected population (Rubin et al., 2005), including posttraumatic stress reactions (Galea et al., 2002), especially if one has a personal connection to the victims (Thoresen et al., 2012). Geographical proximity to a terror attack site is also associated with PTSD prevalence; Galea et al. (2002) found in their survey about the 9/11 terror attack that PTSD was more common among individuals who were more closely exposed to the attacks. Similar results were found by North et al. (2011) who found that 35% of those directly exposed to the 9/11 attacks and 20% of eyewitnesses met the criteria for PTSD at any time after the attack. In addition, 35% of those exposed via a close associate's exposure developed PTSD. Here, we tested whether geographical and psychological proximity to the Turku terror attack affected subsequent attitudes towards out-groups believed to be associated with the perpetrator. We also investigated how emotions elicited when reminded of the attack affect attitudes toward different out-groups and, especially, whether those attitudes could be affected by emotion regulation.

The Intergroup Emotions Theory (Mackie et al., 2000) suggests that individuals appraise stimuli and experience emotions with respect to the group they identify with (Miller et al. 2004). A significant source for negative intergroup emotions (e.g. anger, fear, resentment or disgust;

Cottrell and Neuberg, 2005) is perceived intergroup threat (Riek et al., 2006). The emotional dynamics in response to threat have been described abundantly: Threats give rise to an anxious arousal (Jonas et al., 2014) and to neutralize this aversive emotion, proximal defenses emerge. These defenses consist in suppression of the threatening thoughts from awareness, increased vigilance for new information and heightened anxious arousal (Jonas et al., 2014). After a delay, distal defenses emerge, which may include cultural worldview defense, adherence to the in-group and distancing oneself from the out-group (Greenberg et al., 2008; Jonas et al., 2014; Pyszczynski et al., 1999; Tritt et al., 2012).Out-group threat implies that one group's actions, beliefs or characteristics are perceived to threaten the wellbeing of another group or challenge it from reaching its goals (Riek et al., 2006). For example, if an out-group is perceived a threat to the wellbeing of the group one identifies with, the individual may react with anxiety (Smith and Mackie, 2016) and form aversive attitudes toward the out-group (Mackie and Smith, 1998). Further, ethnic and cultural differences may represent a symbolic threat to the majority culture, i.e. through differences in moral values, norms, beliefs, attitudes, etc. (Stephan et al., 1999). Because previous research has linked intergroup threat with out-group-bias (Riek et al., 2006), we expected that exposure to a intergroup threat, a terror attack, as well as reminders of it, increases negative emotions towards groups believed to be associated with the perpetrator.

Negative emotions and negative attitudes toward out-groups are also connected to a concept closely related to terror attacks, posttraumatic stress disorder. This condition is characterized by dysfunctional emotion regualtion, avoidance of reminders of the traumatic event and overly negative appraisals of the event (Boden et al., 2013; Ehlers and Clark, 2000; Foa and Rothbaum, 1998). Consequently, as discussed by Boden et al. (2013), individuals with PTSD may use expressive suppression excessively and under-utilize cognitive reappraisal. Indeed,

reductions in the use of expressive suppression and increases in the use of cognitive reappraisal have been found to predict decreased PTSD severity (Boden et al., 2013). Furthermore, PTSD is also associated with prejudice, ethnocentrism and negative out-groups attitudes, especially in relation to traumatic stressors that involve terrorism (Goodwin et al., 2017; Hobfoll, et al., 2006)

An important aspect concerning emotions is that humans do not passively emit them (Mauss et al., 2007), but actively influence their emotions, and when and how emotions are experienced and expressed (Gross, 1998). The process model of emotion regulation (Gross, 1998) posits that emotion regulation occur at different time points during emotion-generating situations, and distinguishes five different regulatory processes: situation selection, situation modification, attentional deployment, cognitive change, and response modulation. A cognitive change strategy is cognitive reappraisal and involves cognitively changing the meaning of a situation to modify its emotional impact. A response modulation strategy is expressive suppression and involves inhibiting emotion-expressive behavior (Gross, 1998). Previous research has generally found associations between cognitive reappraisal and increased positive and decreased negative affect (Gross and John, 2003; Nezlek and Kuppens, 2008; Schmidt et al., 2010; Szasz et al., 2011), as well as associations between suppression and decreased positive and increased negative affect (Butler et al., 2003; Campbell-Sills and Barlow, 2007; Gross and John, 2003).

Other constructs relating to emotion regulation are mindfulness and acceptance. Mindfulness simultaneously affects several emotion regulation components and entails observing one's emotions without judgment and acceptingly, not inhibiting or suppressing them (Linehan et al., 2007). Similarly, acceptance as a therapeutic intervention refers to being present in current experiences (Cavanagh et al., 2014). Acceptance and mindfulness-based techniques have been

associated with positive outcomes in affective measures (Wolgast et al., 2011), emotion regulation (Alkoby et al., 2019; Hill and Updegraff, 2012; Robins et al., 2012), and improved anxiety and depression symptoms (Cavanagh et al., 2014; Goldin and Gross, 2010). Although mindfulness necessitates practice (Chambers et al., 2008), brief attentional manipulations can also affect outcome affectivity and memory (Grafton et al., 2012; Watkins and Teasdale, 2001, 2004), Specifically, brief mindfulness and acceptance manipulations have positive effects on affective measures (Erisman and Roemer, 2011; Wolgast et al., 2011).

Building on the Intergroup Emotions Theory, we assessed whether modifying the negative emotions elicited by a threatening intergroup event affects subsequent intergroup attitudes. In support of this, Tenenbaum et al. (2018) showed that induced feelings of happiness, compared to fear and a control condition, increased accepting intergroup attitudes toward Muslim asylum seekers. Some studies have assessed whether using specific strategies to regulate emotions affects political attitudes toward out-groups. Halperin et al. (2013) found in two studies that the use of cognitive reappraisal in the context of an intergroup conflict resulted in more support for conciliatory policies and less support for aggressive ones. Similar results for the role of cognitive reappraisal in reducing political intolerance toward out-groups was found by Halperin et al. (2014). Steele and colleagues (2017) investigated if out-group bias were affected by the emotion regulation strategy of reflection, a strategy they suggest may have similar effects as reappraisal (Steele et al., 2017). During their data collection, the Boston Marathon bombings occurred, providing the researchers with the opportunity to assess the effects of emotion regulation both before and after the terror attack. Reflection reduced bias and anger toward Muslims after, but not before, the bombings. This indicates that this emotion regulation strategy was effective in reducing negative affect and bias in a context of strong intergroup threat. In

addition to cognitive reappraisal, the literature also describes on the effect of other emotion regulation strategies. Alkoby and colleagues (2017) found that, compared to controls, participants who received reappraisal training, mindfulness training, or training on a combination of mindfulness and reappraisal were more in favor of conciliatory policies. Lueke and Gibson (2016) found that a brief mindfulness intervention reduced racial discrimination, also among novice practitioners. In our previous experiment (Westerlund, Santtila & Antfolk, 2019), we wanted to assess how emotion regulation stratgies affected the participants' reactions to out-group threat in more everyday contexts. We presented the participants with material presenting out-groups in a threatening light (e.g. news reports about immigrants having committed crimes, psychiatric patients having committed manslaughter and the possibility of an invasion by a neighboring country). We found that not only reappraisal, but also suppression increased the acceptance of out-groups after a short delay (ca. 20 seconds). It has been suggested that negative out-group attitudes are associated with distal defenses, and thus only emerge with a delay after experienced threat (Greenberg et al., 2008; Pyszczynski et al., 1999; Jonas, et al., 2014). We suggest that our results from the previous study may have been different if the outcome had been measured after a longer delay, an aspect we took into account in the current study. Another finding from our previous study (Westerlund, Santtila & Antfolk, 2019) was related to the influence of habitual emotion regulation, i.e. emotion regulation strategies that the individual uses frequently in everyday life: In the control and instructed suppression conditions, acceptance toward out-groups increased at low levels of both habitual reappraisal and suppression, and decreased at high levels. In the instructed reappraisal group, on the other hand, acceptance increased at high levels of both habitual reappraisal and suppression. We interpreted these findings in accordance with the results from Dixon-Gordon et al. (2015), who showed that the

use of a broad array of emotion regulation strategies was positively associated with increased psychopathology. The authors propose that individuals with more psychopathology experience more negative emotions and therefore require more efforts to down-regulate. We suggested that our results could reflect components in the reappraisal strategy that facilitates emotion regulation in individuals with more dysfunctional habitual emotion regulation after exposure to negative stimuli. In the current study, we therefore expected that individuals with less effective emotion regulation (characterized by higher use emotion regulation strategies and more emotional distress) would benefit more than others from the instructed cognitive reappraisal strategy. For these individuals, the suppression instructions would not facilitate effective down-regulation of negative emotions.

Current study and hypotheses

We conducted a population-based, randomized online experiment to assess the effect of emotion regulation strategies on attitudes toward groups associated with the perpetration of a real terror attack. Based on previous literature, we formulated the following hypotheses: 1) Participants from Turku (where the attack took place) vs. participants from Tampere (a similar sized Finnish city) would report stronger negative emotions after being presented with negatively charged terror-related information. As a result, attitudes toward groups believed to be associated with the perpetrator would be more positive among participants from Tampere. 1.1) We expected that the physical and psychological distances to the terror site and the number of reported traumatic reactions after the incident would have similar effects (that is, increased proximity and traumatic symptoms are associated with more negative emotions and more negative attitudes toward groups believed to be associated with the perpetrator).1.2) We expected that the number of reported traumatic reactions after the incident would moderate the effects of the emotion

regulation manipulations (see below) so that manipulations are less effective at higher levels of traumatic reactions. 2) We expected that emotion regulation strategies employed during exposure to negatively charged terror-related information affect subsequent emotions so that the reappraisal and mindful attention groups would experience less negative emotions than the control and the suppression groups. 3) Increased negative emotions resulting from exposure to negatively charged terror-related information negatively affect subsequent attitudes toward both out-groups in general and out-groups perceived to be associated with the perpetrator in particular (i.e. more strongly). We expected that reappraisal and mindful attention will increase positive out-group attitudes through a decrease in negative emotions. Suppression and control conditions will decrease positive out-group attitudes through higher levels of negative emotions.3.1) Based on our previous findings (Westerlund, Santtila, & Antfolk, 2019), we expected that habitual emotion regulation would moderate the effect of the manipulation so that high levels of both habitual reappraisal and suppression in the reappraisal and mindful attention groups increase positive out-group attitudes, whereas high levels of both habitual reappraisal and suppression in the suppression and control group decrease positive attitudes.

Materials and methods

Ethical permission

This study protocol was approved by the Research Ethics Committee of Åbo Akademi University. All subjects gave written informed consent.

Preregistration

The hypotheses and the related analysis plan were pre-registered on the Open Science Framework after the data collection was completed, but before any inspection and analysis of the data had taken place. The plan can be accessed through osf.io/73utm/.

Power analysis

We examined the effect sizes of a comparable study conducted within a conflict-setting, where reappraisal led to more support for conciliatory policies and less support for aggressive policies after anger-inducing, conflict-related material (*d*s = 0.67 and 0.79; Halperin et al., 2013). We, however, expected lower effect sizes in the current study, since we believed it likely that emotional reactions of participants within an intractable conflict are stronger than in an otherwise peaceful society. Using G*Power (Faul et al., 2007), we conducted a power analysis to detect a small to medium effect size ($f = 0.20$ with a $p = .05$) for the ANOVA of the out-group attitudes between experimental conditions. To reach a power of .95 the analysis yielded a required N of 436.

Participants

In total 889 participants responded to the survey at least partially. Data from 501 participants (308 women, 190 men and 3 other) were used for hypothesis testing after planned exclusions. We removed participants who did not confirm they had read the instructions or who incorrectly answered on more than one of the three control questions, as well as participants who had not completed the relevant measures. We sent invitation letters to a population-based, random sample of 5000 18-64-year-old Finnish-speaking individuals residing in two Finnish cities: 2500 invitations to Turku (where the incident took place) and 2500 invitations to Tampere (a similar size city elsewhere in Finland). The sample was drawn from the Finnish Population

Register Centre. Before sending invitations, we randomized the sample into four groups each with 1250 individuals: a cognitive reappraisal group, an expressive suppression group, a mindful attention group, and a control group (625 invitations were sent to Turku and 625 to Tampere). Invitation letters included a condition-specific survey link. The data collection was conducted during a time period of eight weeks seven to eight months after the attack. We continued collecting data until no new responses were submitted for two weeks.

Measures

Emotion Regulation Questionnaire (ERQ; Gross and John, 2003). The ERQ is a 10-item scale designed to measure the habitual use of two specific emotion regulation strategies, cognitive reappraisal and expressive suppression. Answers are recorded using a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree). The scale has been validated in different contexts, including American (Gross and John, 2003), German (Wiltink et al., 2011) and Swedish (Enebrink et al., 2013). We used a Finnish translation (Vuorela and Nummenmaa, 2004) from the Stanford Psychophysiology Lab Resources web site (spl.stanford.edu/resources). The scale has adequate psychometric properties in the Finnish population (author's own).

Difficulties in Emotion Regulation Scale-16 (DERS-16). The DERS-16 (Bjureberg et al., 2016) is a short form of the original 36-item DERS by Gratz and Roemer (2004). DERS-16 has five of the original DERS' six factors: Nonacceptance of Emotional Responses, Difficulties Engaging in Goal-Directed Behavior, Impulse Control Difficulties, Limited Access to Emotion Regulation Strategies, and Lack of Emotional Clarity (Bjureberg et al., 2016; Gratz and Roemer, 2004). Answers are reported using a 5-point scale from 1 (almost never) to 5 (almost always). DERS-16 has adequate psychometric properties (Bjureberg et al., 2016; Hallion et al., 2018).

The translation was compiled from an existing Finnish translation of the original DERS (Tapolaa, Lappalainen, and Wahlström, 2010). There is preliminary support for the validity of the scale in the Finnish population (Tapolaa et al., 2010).

Trauma symptoms. To assess how participants had coped with the terror event, a Finnish translation (Poijula, 2002) of the Impact of Events Scale-Revised (IES-R) was used. It is a 22-item self-report measure about subje ctive distress caused by traumatic events. Items were rated on a 5-point scale ranging from 0 (not at all) to 5 (always). Respondents were asked to retrospectively report symptoms experienced during the two weeks after the incident.

Verbal emotions. Participants were asked to indicate on a slider bar between 1 (not at all) and 100 (very much) how much anger, fear, joy, sadness, and anxiety they felt at the current moment. The verbal emotions were recorded twice; after the demographic questions, and after the stimulus material.

Physical proximity to the attack site. We asked participants how far they were from the attack site at the moment they knew about it (< 100 meters, ca. 200 m, ca. 500 m, ca. 1 km, ca. 5 km, ca. 10 km, ca. 50 km, and > 100 km).

Psychological proximity to the attack site. We asked participants to indicate if they knew someone who was injured or killed in the attack, if they knew someone who knows someone who was injured, and if they knew someone who was seen in the (stimulus) news material? Positive answers to the questions equated 3, 2 and 1 points, respectively.

Distraction tasks. In our previous study with a similar experimental set-up (Westerlund, Santtila & Antfolk, 2019), the delay between the stimulus and the outcome measure (attitudes toward out-groups) was short. In the current study, we wanted to target distal rather than

proximal defenses, the latter of which have been associated with negative out-group attitudes (Pyszczynski et al., 1999). We employed four distraction tasks before the outcome measure: a brief questionnaire about (1) what news medias they mostly consume, and (2) which part of the news interests them the most (e.g. international, national, economy), as well as a number and word search task (30-45 seconds each).

Out-group attitudes. We asked the participants to report on a slider bar from 1 (very negative) to 100 (very positive) their general views towards different social groups: groups potentially perceived to be associated with the attack (attack-associated groups for brevity below) (immigrants from the Middle East, immigrants from Africa, Moroccans, Muslims, groups positive to immigration) and other groups (groups critical to immigration, elderly, gay persons, Christians, feminists, Finland-Swedes, people with high income, people with substance use disorder). We included the latter groups in order to assess whether the expected reactions would generalize to out-groups overall, or whether they would be limited to attack-associated groups.

Procedure

The invitation card contained a condition-specific link. The informed consent page described the purpose, data handling, as well as the anonymous and voluntary nature of the study. A disclaimer stated the importance of reading the whole description of the study before deciding to participate. The study description stated that the purpose of the study was to assess emotional reactions and related opinions to the news material used in the reporting of the attack, potentially eliciting distress in participants. Participants were recommended not to participate if they felt it would be too distressing. After consenting to the study, participants filled in demographic information, reported their verbal emotions, the ERQ, the DERS, and the IES-R.

Next, participants saw the instructions for the newspaper article task. The instructions were modified based on the instructions used by Richards and Gross (2000) and Halperin et al. (2014). Participants in the cognitive reappraisal group were instructed to read the articles from a neutral, external perspective, thinking that the material had no personal or emotional meaning to them, while they tried to feel as few negative emotions as possible. The suppression group was instructed to suppress and hide all emotions the material may have awoken in them. The mindful attention group was instructed to observe their bodily reactions and their thoughts, while gently accepting all sensations they were experiencing. The control condition was merely asked to read the material and study the pictures.

We asked the participants to check a box to express they had read and understood the instructions. After two of the stimulus materials, participants saw shortened, brief reminders of the instructions. After the last article, participants answered the verbal emotion measure, the physical and psychological proximity measures. Next, participants completed the distraction tasks. Participants then reported their attitudes toward a list of minority groups. Lastly, participants answered three questions about details in the stimulus material to check they had attended to the material. Before completing the survey, participants were given the option to participate in a lottery for a cinema ticket. On the last page of the survey participants saw contact information and a description of a short breathing exercise in case the assessment had provoked strong emotions.

Stimulus material

Stimuli consisted of five headlines, pictures, and articles about the terror attack published in Finnish media. The stimuli were presented in the same order for all participants.

Data analysis

All statistical analyses were conducted using SPSS 24.0. The scoring of ERQ and DERS-16 is described in (Westerlund & Santtila, 2018). The ERQ subscales showed acceptable reliability; $\alpha = .69$ for reappraisal, and $\alpha = .78$ for suppression. The DERS-16 total scale had excellent reliability, $\alpha = .91$. IES-R was scored according to Weiss and Marmar (1997). The reliability for the IES-R and its subscales was acceptable to excellent; intrusion ($\alpha = .87$), avoidance ($\alpha = .76$), hyperarousal ($\alpha = .78$), and total scale ($\alpha = .91$).

We then confirmed that the assumptions of the linear model were met. We screened for outliers with histograms. We confirmed the homogeneity of variances using Levene's test and the variance ratio (Field, 2013).

We tested our first hypothesis about differences in emotional reactions, out-group attitudes, and posttraumatic reactions among participants in Turku and Tampere using t tests. The association between physical distance and negative emotions was assessed using regression. The relationship between negative emotions and psychological proximity and posttraumatic symptoms, respectively, were assessed with correlations.

To test predicted interactions, we first inspected correlations between the variables. We conducted mediation and moderated mediation analyses using the PROCESS macro for SPSS (Hayes, 2018) with the experimental groups as independent, categorical variables, and the control group as reference category (Hayes and Preacher, 2014; Hayes, 2018). The path from the predictor via the mediator to the dependent variable quantifies the difference in the outcome between the experimental group (reappraisal, mindful attention or suppression) and the control group on the mediator, which affects the outcome (relative indirect effects). The relative direct

effects represent the effect of the predictor directly on the outcome (Hayes, 2018). We did not center the variables prior to the interaction analyses due to its limited effect on the accuracy of estimations and hypothesis tests (discussed in Hayes, 2018). Before the mediation and moderated mediation analyses, we conducted separate linear regressions with the variables used in the mediation analyses and inspected the regression diagnostics. To obtain standardized beta coefficients, we standardized the variable values prior to the analysis. In the mediation and moderated mediation analyses, we used 1000 bootstrapped iterations to produce bias-corrected 95% confidence intervals.

When we assessed the interaction of physical proximity from the attack site, we dichotomized the proximity variable into over and under 200 meters from the attack site. The psychological proximity score was calculated as described in the measures section.

To test our last two hypotheses, we employed ANOVAs with planned comparisons. We assessed the relationship between negative emotions and out-group attitudes with regression. In order to protect against Type I error due to multiple testing, we used a Holm-Bonferroni correction at the .05 significance level for the testing of our three hypotheses (in total 13 tests, not including the planned contrasts). We did not correct for multiple testing when assessing the predicted interactions.

Results

Initial analyses

We first examined demographic information (Table 1). We also assessed whether the stimulus material had affected the level of negative emotions and found a significant difference in the negative emotions before, $M = 12.97$, $SE = 0.68$, and after, $M = 29.28$, $SE =$

0.96, the stimulus presentation, $t(500) = 17.85$, $p < .001$, $r = .62$. The experimental groups did not differ on negative emotions before the manipulation, $F(3, 497) = 0.75$, $p = .522$, $\omega^2 = .00$.

[TABLE 1 ABOUT HERE]

Hypothesis testing

Next, we tested our first hypotheses that increased negative emotions after the stimuli, and consequently more negative attitudes toward out-groups associated with the perpetrator, would be associated with residency in Turku where the attack took place, and with physical and psychological proximity to the attack site. We also expected increased posttraumatic symptoms to have similar associations.

Physical proximity to the attack site. Comparing the four negative emotions between participants from Turku and Tampere did not reveal significant differences in levels of negative emotions: anger, $t(482) = 0.38$, $p = .702$; fear, $t(482) = 0.55$, $p = .580$; sadness, $t(482) = 0.40$, $p = .690$, and anxiety, $t(482) = 1.14$, $p = .256$. Likewise, there was no difference in the attitudes toward attack-associated groups, $t(482) = 0.23$, $p = .821$ or other groups, $t(482) = 0.65$, $p = .514$. We decided, in deviation from the original analysis plan, to create a composite variable consisting of the mean score of negative emotions to reduce the number of statistical tests. The linear relationship between physical distance from the attack site and negative emotions was not statistically significant, $\beta = -.04$, $p = .397$.

Deviating from the original analysis plan, we performed further comparisons on the IES-R score. We found that the IES-R score differed between the two cities so that participants from Turku reported higher IES-R scores, $M = 18.31$, $SD = 11.76$, than Tampere, $M = 11.93$, $SD = 10.37$, $t[436.18) = 6.26$, $p < .001$, d = 0.62. The IES-R score was also associated with the distance

to the attack site, $r = -.30$, $p < .001$, such that participants who had been closer to the attack site reported higher IES-R scores.

Psychological proximity to the attack. Psychological proximity was positively associated with negative emotions, $r = .09$, $p = .043$, but not with attitudes toward attack-associated out-groups, $r = .02$, $p = .677$. The IES-R was positively associated with psychological proximity, $r = .20$, $p < .001$.

Posttraumatic symptoms. The IES-R score correlated significantly with negative emotions both before and after the stimuli, $r = .23$, $p < .001$, and $r = .54$, $p < .001$, respectively. The IES-R also correlated negatively with positive attitudes toward attack-associated groups, $r = -.13$, p = .004, but not other groups, $r = .04$, $p = .361$.

We then tested our second hypothesis that the reappraisal and mindful attention groups would experience less negative emotions after the stimuli than the control group and the suppression group. We found that the experimental condition had a significant, small to medium effect on all negative emotions (Table 2).

[TABLE 2 ABOUT HERE]

Planned contrasts showed that the mindful attention and reappraisal groups did not experience less negative emotions than the suppression and control conditions as hypothesized, $t(480.19) = -0.82$, $p = .410$, $r = .04$. We performed further contrasts to explore which group differences were statistically significant. The results showed that the control condition, $M = 29.38$, $SE = 1.92$, did not differ from the experimental conditions $t(171.37) = -0.15$, $p = 883$, $r = .01$, and suppression, $M = 30.43$, $SE = 1.85$, did not differ from mindful attention and reappraisal conditions, $t(268.62) = -0.91$, $p = .362$, $r = .06$. We found, however, that participants

in the reappraisal, $M = 21.25$, $SE = 1.64$, experienced less negative emotions than in the mindful attention, $M = 35.49$, $SE = 2.02$, $t(250.70) = -5.47$, $p < .001$, $r = .33$.

Next, we tested our third hypothesis that the elicited negative emotions would affect attitudes toward out-groups, and particularly out-groups associated with the perpetrator. Increased negative emotions after the stimuli negatively predicted attitudes toward attack-associated groups, $b^* = -.16$, $p < .001$, $R^2 = .03$, $F(1, 500) = 13.62$, $p < .001$, but not toward other groups, $b^* = -.03$, $p = .470$. We also expected reappraisal and mindful attention to increase positive attitudes toward out-groups through a decrease in negative emotions, while the effect for the suppression and control conditions would be the opposite (i.e., more negative attitudes through increased negative emotions). The experimental condition did not have an effect on the attitudes toward attack-associated groups, $F(3, 497) = 0.59$, $p = .623$, $\omega^2 = .00$, nor other groups, $F(3, 497) = 0.20$, $p = .899$, $\omega^2 = .00$. However, mediation analysis using model 4 in PROCESS (Hayes, 2018), showed that there was a statistically significant indirect effect of mindful attention and reappraisal conditions (relative to the control condition) through negative emotions on the attitudes toward attack-associated groups (Figure 1).

[FIGURE 1 ABOUT HERE]

We also expected that a higher number of traumatic symptoms would decrease the effect of the reappraisal and mindful attention manipulation, increase negative emotions, and, as a result, negative attitudes toward attack-associated out-groups (hypothesis 1.2.). We tested our prediction using model 6 of PROCESS (Hayes, 2018), with negative emotions and the total score on IES-R as mediators. There was no indirect effect of experimental conditions on the attitudes toward attack-associated groups nor other groups, as mediated via negative emotions and

posttraumatic symptoms: for mindful attention, $b^* = -.01$, 95% BCa CI [-.03, .01]; for reappraisal, $b^* = .01$, 95% BCa CI [-.02, .04], and for suppression, $b^* = -.00$, 95% BCa CI [-.02, .01].

Another expected interaction concerned the role of habitual emotion regulation on the experimental condition and out-group attitudes (hypothesis 3.1.). ERQ reappraisal correlated positively with positive attitudes toward attack-associated groups, $r = .13$, $p = .004$, and ERQ suppression correlated negatively, $r = -.17$, $p < .001$. No relationship was found for emotion dysregulation as measured with DERS-16. Habitual emotion regulation was also associated with the attitudes toward other groups: $r = .15$, $p = .001$ for reappraisal; $r = -.20$, $p < .001$ for suppression; and $r = .10$, $p = .031$ for emotion dysregulation. We expected high levels of habitual reappraisal and suppression in the reappraisal and mindful attention group to increase positive attitudes toward out-groups, and high levels of habitual emotion regulation in the suppression and control group to decrease positive attitudes. We tested this using model 2 of PROCESS (Hayes, 2018) with ERQ reappraisal and suppression as moderators. The relationship between the mindful attention condition and the positive attitudes toward attack-associated groups was moderated by habitual expressive suppression, $b^* = .35$, 95% BCa CI [.07, .62], $t = 2.49$, $p = .013$, indicating that as suppression increased by one unit, the difference in positive attitudes between the mindful attention and control groups increased an equivalent to b^*. A similar relationship was found between the mindful attention condition and positive attitudes toward other groups, $b^* = .31$, 95% BCa CI [.03, .58], $t = 2.20$, $p = .028$. An explorative inspection of the slopes showed that in the mindful attention group high levels of both habitual suppression and reappraisal tended to increase positive attitudes toward attack-associated groups, whereas the tendency in other conditions was the opposite.

Emotion dysregulation did not mediate the relationship between experimental condition and attitudes toward out-groups. However, in the suppression condition, a higher score in emotion dysregulation decreased positive attitudes toward attack-associated groups, whereas the tendency in other conditions was the opposite.

Discussion

We conducted an online experiment on the effect of three emotion regulation strategies compared to a control condition, as well as physical and psychological proximity to a terrorist attack, on attitudes toward out-groups after exposure to news material about the attack.

First hypothesis: Physical and psychological proximity, and posttraumatic symptoms

We did not find support for our hypothesis that participants from Turku would report more negative emotions and less positive attitudes toward out-groups associated with the perpetrator. Neither did we find that physical proximity was associated with negative emotions and attitudes toward out-groups. One possible explanation may be that the incident was the first recorded Islamist terror attack in Finland, and may hence have had strong emotional effects on the entire population. Participants from Turku, nevertheless, reported higher posttraumatic symptoms in the two weeks following the attack than participants from Tampere. In addition, participants who had been physically closer to the attack site reported more posttraumatic symptoms. The lack of difference in negative emotions after the stimuli between the two cities may suggest that the initial posttraumatic symptoms have attenuated over time (Shalev, 2002) and reminders do not cause stronger negative reactions in individuals who were closer to the attack site. There is some support for this possibility: North and colleagues (2011) assessed the associations between geographic distance from the World Trade Center during the 9/11 attacks

and the development of PTSD, and found that only those within a radius of about one block from the attack displayed elevated PTSD.

We also found that psychological proximity was associated with more negative emotions, but, against our hypothesis, not with lower positive attitudes toward attack-associated out-groups. It is possible the stimulus material hence provoked stronger reactions from individuals with personal relationships to the victims. The lack of effect on out-group attitudes, on the other hand, warrants further reflection. As suggested above, attitudes toward attack-associated out-groups might have affected the entire population relatively equally. Another limitation is that less than five participants included in the hypothesis testing reported knowing personally someone who was injured, indicating that we did not reach many participants with a greater psychological proximity.

We found that posttraumatic symptoms after the attack correlated with negative emotions before and, even more strongly, after stimulus presentation. This might reflect the increased sensitivity to material about a traumatic event in traumatized individuals (Pole, 2007). However, as our measure was retrospective in nature the current psychological state might have had an impact on the psychological trauma measure. The number of traumatic symptoms also correlated negatively with positive attitudes toward attack-associated groups, but not of other groups. We propose that individuals who experienced a stronger negative impact of the attack tend to develop more negative attitudes toward groups they associate with the threat. This stresses the importance of addressing posttraumatic symptoms in the aftermath of a terror event, primarily to improve the wellbeing of the individual, but also as a way to prevent negative intergroup relations.

Second hypothesis: Emotion regulation

Terror attacks produce significant negative emotional reactions in affected populations (Rubin et al., 2005; Thoresen et al., 2012) and the stimulus material about the terror attack increased negative emotions in the participants. We found partial support for our second hypothesis that the reappraisal and mindful attention groups would experience less negative emotions after the stimuli than the control and suppression group. The effects on negative emotions were small to medium, and were due to differences between the reappraisal and mindful attention conditions. As predicted, participants in the reappraisal group reported lowest levels of negative emotions, but contrary to our hypothesis, participants in the mindful attention group had the highest. The results for the reappraisal group correspond to numerous results indicating that reappraisal reduces or is negatively associated with negative emotions (e.g., Balzarotti et al., 2010; Gross and John, 2003; Haga et al., 2009; Kalokerinos et al., 2016; Wolgast et al., 2011).

Previous literature have showed that mindfulness techniques (even brief ones; Erisman and Roemer, 2011; Wolgast et al., 2011) reduce negative emotions (Eberth and Sedlmeier, 2012). However, since this was not supported in the current study, we propose that in the case of stronger threats a longer period of mindfulness training may be needed for the effects to emerge. There is some support for this possibility; Brazier (2013) and Hanley et al. (2016) propose that being mindful when facing negative emotions and experiences may heighten the awareness about difficult feelings. The heightened awareness again can result in increased levels of distress—distress novice mindfulness practitioners individuals cannot properly manage (Lomas et al., 2015). Further, our results imply that viewing terrorism-related threats may result in stronger negative emotions than other violent material, and even exert a strong effect on attitudinal

processes (Shoshani and Slone, 2008). The aversive emotions triggered by such threats may require greater regulatory efforts than our instructed interventions provided.

Third hypothesis: Effect of emotion regulation on out-group attitudes and related interactions

Across conditions, we found that adverse emotions directly negatively predicted the attitudes toward attack-associated groups, but not toward other groups. This is in line with the Intergroup Emotions Theory, according to which individuals appraise objects and experience emotions based on their group membership. Negative emotions predicted decreased positive attitudes toward attack-associated groups, who were likely perceived as a threat toward the majority in-group. In this study, no threatening material was presented about other groups.

We found partial support for our third hypothesis that experimental condition would affect the attitudes toward out-groups via negative emotions. The experimental condition did not directly affect the positive attitudes toward attack-associated groups or other groups. This differs from previous results on the causal effects of emotion regulation strategies on attitudes toward out-groups (Alkoby et al., 2017; Halperin et al., 2014; Halperin et al., 2013; Steele et al., 2017).

The results for reappraisal were in line with our hypothesis and reflect previous literature indicating that reappraising negative emotions leads to more positive attitudes toward out-groups (Alkoby et al., 2017; Halperin et al., 2014; Halperin et al., 2013). Our results concerning mindful attention differ from an earlier study (Lueke and Gibson, 2016), in which a brief mindfulness intervention led to reduced racial bias. However, in contrast to our study, the participants in Lueke and Gibsons (2016) study were not exposed to negative affective stimuli. We suggest that increased awareness of negative emotions resulting from the stimulus material may have

produced our contrasting results on out-group bias. One plausible explanation for our results is that since the reappraisal and mindful attention conditions exhibited the highest and lowest levels of negative emotions, the effect of the emotion regulation strategy on the attitudes toward out-groups possibly emerge after reaching a certain threshold of negative emotions. This is supported by study by Steele and colleagues (2017), in which reflection as an emotion regulation strategy reduced bias and anger toward a terror-associated out-group after, but not before, an attack. It is also possible the material activated already existing negative attitudes toward attack-associated groups, resulting in the emergence of negative emotions. Moreover, proximal and distal defenses emerge after exposure to threat, as described in theories of threat and defense (Jonas et al, 2014; Pyszczynski et al., 1997; Tritt et al., 2012). As these theories posit, worldview defense and negativity toward out-groups occur after the proximal defenses have subsided. Since we wanted to target the distal defense processes specifically, we employed distraction tasks between the stimuli and the attitudinal out-come measure. However, it is possible that the distraction tasks were too long in duration and the more immediate negative affective reactions were neutralized during the distraction tasks.

As for indirect effects, we found that the mindful attention and reappraisal conditions indirectly affected the positive attitudes toward attack-associated groups and other out-groups through increased and decreased negative emotions, respectively. We found no indirect effect of experimental conditions on the positive attitudes toward attack-associated groups nor other groups, mediated via both negative emotions and posttraumatic symptoms. This indicates that negative emotions and posttraumatic symptoms are involved in the formation of attitudes toward attack-associated groups, but the effects of the emotion regulation interventions are not completely mediated through these variables, but through other routes additionally.

The results also showed that habitual cognitive reappraisal was positively and habitual expressive suppression was negatively associated with positive attitudes toward attack-associated groups and other groups. Emotion dysregulation was also positively associated with positive attitudes toward other groups. Partly supporting our final prediction (hypothesis 3.1.), the relationship between the mindful attention condition and the positive attitudes toward attack-associated and other groups was positively moderated by habitual expressive suppression. Expressive suppression is opposite to mindful attention: the former is based on avoidance of emotion expression, whereas the latter is based on attending to, observing, and accepting any emerging emotions. Individuals who habitually show greater expressive suppression may experience more challenges in assuming a mindful and accepting stance to their emotions. As a result, the negative effect of mindful attention on the outcome emotions may have been reduced among habitual suppressors.

Finally, our explorative results showed that a higher score in habitual emotion dysregulation in the suppression condition decreased the positive attitudes toward attack-associated groups, whereas the results in the other conditions were in the opposite direction. Since suppression generally does not reduce the negative affect and leaves it unresolved (Gross and John, 2003), the instructions to suppress negative emotions may have resulted in stronger negative emotions and attitudes among individuals with fewer habitual abilities to regulate emotions effectively.

Our results can be used as complementary interventions in programs working on preventing or improving negative intergroup attitudes, for example in schools, organizations and for actors working in multicultural settings. Emotion regulation training and interventions could also be applied on individuals at heightened risk of committing violence toward out-groups, for

example in prisons, as part of individual or group interventions. An important aspect implied by our results is that brief mindful attention interventions may not help novice practitioners in reducing negative affect when facing negative stimuli, but more comprehensive trainings are likely needed.

Another intriguing area of implementation, and a topic for future research, is whether media portrayals of terror attacks can function in an emotion regulatory manner in order to decrease the number of extreme aversive reactions from forming.

Limitations

The current study was conducted online, whereby control over how well the participants complied with the emotion regulation instructions is decreased. It is possible that individuals who failed to employ the instructed emotion regulation strategy may have used another, more familiar one. The response rate was rather low, although comparable to earlier studies with similar data collection method. Due to the anonymous nature of the study, we could not send reminders to those who did not participate after the first invitation. The sample may also have been somewhat biased by the disclaimer on the informed consent page. We warned that the participation may provoke difficult emotions and discouraged participation if the individual estimated that the own reaction could be too distressing. Moreover, the trial of the perpetrator occurred during the data collection. The trial was reported in the media, and the public could read about the perpetrator's plans for the attack. He had, for example, planned to decapitate the victims (Yle, 2018). Such concurrent, distressing information might have affected participants' attitudes. It is possible that participants' attitudes toward attack-associated groups were already strongly formed during the aftermath of the actual attack. The attack occurred ~7 months before

our data collection. Another possibility is that the immediate arrest of the perpetrator, the legal proceedings, and the resulting verdict have attenuated the sense of threat in the population.

A limitation relating to the measures is that he IES-R was measured retrospectively, which could have led to recall bias. Further, we did not measure whether participants themselves identified with the groups nor the out-group attitudes before presenting the participants with the stimuli. We did not measure or control for participants' prior consumption of news material related to the attack. It is possible that a more exposure to such material may have desensitizing effects. A final aspect that may have affected the results is that attitudes toward out-groups were measured directly rather than through more convert questions regarding attitudes toward policies concerning out-groups.

Conclusions

We found that reappraisal decreased negative emotions and mindful attention increased negative emotions in response to terror-related news material. We also found that adverse emotions negatively predicted the positive attitudes toward attack-associated groups, but the effect did not differ among experimental groups. The mindful attention and reappraisal conditions also had an indirect effect through negative emotions on the positive attitudes toward attack-associated groups and other out-groups. Posttraumatic symptoms correlated positively with negative emotions, and negatively with positive attitudes toward attack-associated groups, but not other groups. Physical proximity to the attack site did not affect the emotional and attitudinal reactions. Psychological proximity affected the negative emotions, but not the attitudinal measures.

In sum, the results indicate that negative emotions and posttraumatic symptoms are associated with the formation of attitudes toward attack-associated groups, and negative emotions related to terror attacks can be modified using emotion regulation interventions. However, to modify attitudes toward attack-associated out-groups more robust interventions should be applied, possibly at an earlier time point.

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Tables

Table 1

Demographic information about the sample included in the hypothesis testing (n = 501)

		n (%)
Gender		
	Male	190 (37.9)
	Female	308 (61.5)
	Other	3 (0.6)
Highest level of education		
	Primary school	19 (3.8)
	High school	101 (20.2)
	Vocational upper secondary	85 (17.0)
	B.A. / Polytechnic	167 (33.3)
	University degree	129 (25.7)
Area		
	Turku	295 (61.0)
	Tampere	189 (39.0)
Physical distance:		
Distance to the site during the incident		
	< 100 meters	14 (2.8)
	ca. 200 meters	18 (3.6)
	ca. 500 meters	23 (4.6)
	ca. 1 kilometer	70 (14.0)
	ca. 5 kilometers	95 (19.0)
	ca. 10 kilometers	36 (7.2)
	ca. 50 kilometers	10 (2.0)
	> 100 kilometers	233 (46.7)
Psychological distance:		
Number of participants who knew a person who was injured or killed in the attack		4 (0.8)
Number of participants who knew a person who knows someone who was injured		68 (13.6)
Number of participants who knew a someone who was seen in the [stimulus] news material		20 (4.0)

Table 2
The effect of the experimental condition on negative emotions

	df	*F*	*p*	ω^2
Anger	3, 270.02	7.38	<.001	.03
Sadness	3, 270.20	7.25	<.001	.03
Fear	3, 269.37	6.59	<.001	.04
Anxiety	3, 270.56	6.58	<.001	.03
Negative emotions composite variable	3, 271.80	10.90	<.001	.05

Figures

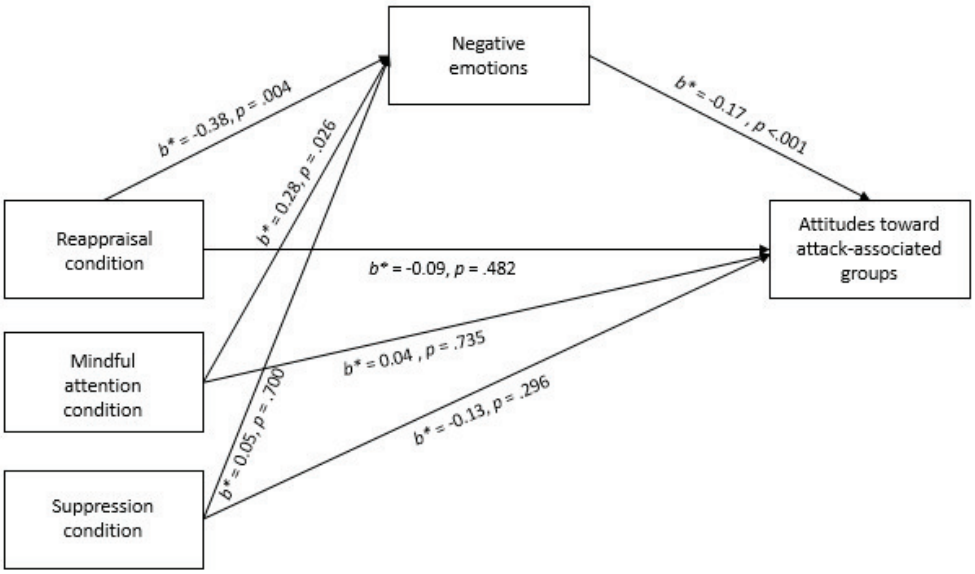

Figure 1. The mindful attention condition (relative to the control condition) resulted in increased negative emotions, which again decreased the positive attitudes toward attack-associated groups, b^* = -0.05, 95% BCa CI [-0.10, -0.01]. The reappraisal condition (relative to the control condition) decreased negative emotions and led to higher acceptance of attack-associated groups, b^* = 0.07, 95% BCa CI [0.02, 0.13]. No indirect effects on acceptance was found for the suppression condition. There were no direct effects of experimental condition on acceptance of attack-associated groups.

Minja Westerlund

Lens of Emotion

Emotion Regulation and Out-Group Attitudes

Emotions play an important role in negative out-group attitudes and prejudice. The present thesis investigates whether modifying those emotions can produce a change in negative out-group attitudes. The results indicate that a specific form of habitual emotion regulation, expressive suppression, is negatively associated with out-group attitudes. Furthermore, the results show that relatively simple modifications to intergroup emotions can influence out-group attitudes after milder threats, but after more severe types of threat, additional interventions may be needed.

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