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„The effects of security priming on empathy in people with various degrees of childhood trauma experiences"

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1 Theoretical Background

1.1 Introduction

Experiences made in childhood influence a person's development and shape the way he or she views the world in general and interpersonal relationships in specific. Further, they impact how a person experiences or behaves in social interactions (Kliethermes, Schacht, & Drewry, 2014). Negative incidents in the social domain, such as childhood trauma, including various types of abuse and neglect, can have severe consequences on how we feel about and relate to other people (Lord, 2013). They can also distort our expectations regarding the actions of others (Kliethermes et al., 2014). Research has shown that such traumatic experiences while growing up are associated with various maladaptive outcomes in adulthood, such as mental health problems (Harden, Buhler, & Parra, 2016).

The current study focused on the effects of maltreatment in childhood on people's functioning in interpersonal relations. In specific, whether childhood trauma has an influence on how empathic a person is towards others. Some studies have investigated the relationship between traumatic experiences and empathy, which is a central attribute that helps us guide our interactions with other people (Grimm et al., 2017; Mazza et al., 2015; Parlar et al., 2014). However, the exact mechanisms through which trauma might influence empathy are still unidentified, as literature presents inconsistent findings (e.g. Greenberg, Baron-Cohen, Rosenberg, Fonagy, & Rentfrow, 2018; Lord, 2013). Probably, the relationship is affected by other factors that lead to these contradictory results, depending on the degree to which they are involved. Such related variables are constructs like attachment style and emotion regulation ability (e.g. Lord, 2013; Troyer & Greitemeyer, 2018). Importantly, it is suggested that people with childhood trauma experiences are more likely to develop an insecure attachment style (Kliethermes et al., 2014). Attachment insecurity, in turn, is believed to also have detrimental effects on interpersonal functioning, like being empathic towards others (Boag & Carnelley, 2016). Besides, it can have negative consequences on the quality of life by affecting mental and physical health (Oehler & Psouni, 2018).

Therefore, a central part of this study was to investigate whether enhancing a person's felt attachment security through a technique called security priming can positively impact empathy in adults. Consequently, this could generally improve their interpersonal functioning. Security priming is a method to increase feelings of safety and care by mentally activating the felt bond to a supportive attachment figure (Gillath & Karantzas, 2019). Research regarding this topic has become increasingly popular in recent years.

This master's thesis wants to add to the existing literature by investigating the association between childhood trauma and empathic functioning as well as the effect of security priming on empathic responding. If this technique can actually enhance empathy, it could be of clinical relevance as an additional intervention used in treatment to increase people's interpersonal abilities and quality of relationships.

To start with, the various concepts related to this matter will be described, as well as their connection with each other. Further, the existing literature on these topics will be reviewed and other related constructs will be introduced. Afterwards, the empirical part of the research will be illustrated and the interpretation of the results will lead to the conclusion of this study.

1.2 Childhood Trauma

In general, traumatic experiences are non-normative and unexpected events that are characterized by a high degree of severity for the person concerned (Wittchen & Hoyer, 2011). In the DSM-IV, a trauma is defined as follows: „the person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others" (American Psychiatric Association, 1994, p. 427). The DSM-5 retains this definition in the section on Posttraumatic Stress Disorder, but with a slightly modified wording (American Psychiatric Association, 2013). In the ICD-10, the following definition is used: Trauma encompasses either short-term or long-term danger to which most people would react with distress and despair (World Health Organization, 1992).

The concept of trauma can be grouped into different forms, including interpersonal (man made) and non-interpersonal trauma (e.g. natural disaster, like an earth quake) and can further be divided on the basis of it being a single event or a repeated occurence. Type I trauma describes it happening one time or in a short period, like a robbery or a car accident. Type II trauma occurs repeatedly or for a longer period of time, like war, torture or abuse, as well as flooding (Maercker, 2013). Symptoms associated with Type I trauma are stronger linked to posttraumatic stress disorder (PTSD; Kliethermes et al., 2014). PTSD is a mental disorder that can develop after the experience of a traumatic event and further includes the following diagnostic criteria: it is characterized by intrusions (disturbing flashbacks and nightmares of the trauma), the attempt to avoid trauma-related cues (thoughts, feelings, activities), emotional numbing and hypervigilance (Maercker, 2013).

The sort of trauma that is investigated in this thesis falls into the category of interpersonal trauma in childhood and therefore involves trauma caused by another person (in the child's environment). Childhood maltreatment is defined as a deliberate violent psychological and/or physical intrusion of a child's integrity by its caregivers, which hurts and endangers the child and obstructs its development (Maercker, 2013). There are different types of childhood trauma discriminated in literature, namely abuse (emotional, physical, and sexual) and neglect (emotional and physical). Abuse refers to an assault against someone. Sexual abuse signifies "sexual contact or conduct between a child younger than 18 years of age and an adult or older person" (Bernstein et al., 2003, p. 175). Physical abuse implys "bodily assaults on a child by an adult or older person that posed a risk of or resulted in injury" (Bernstein et al., 2003, p. 175). Emotional abuse includes "verbal assaults on a child's sense of worth or well-being or any humiliating or demeaning behavior directed toward a child by an adult or older person" (Bernstein et al., 2003, p. 175). Neglect, on the other hand, happens when a caretaker fails to provide for the basic physical and emotional needs, including safetly, food, love and support. Physical neglect is "the failure of caretakers to provide for a child's basic physical needs, including food, shelter, clothing, safety, and health care" (poor parental supervision was also included in this definition if it place children's safety in jeopardy) (Bernstein et al., 2003, p. 175). Emotional neglect implys "the failure of caretakers to meet children's basic emotional and psychological needs, including love, belonging, nurturance, and support" (Bernstein et al., 2003, p. 175).

Childhood maltreatment is an issue that occurs around the world and is estimated to have a prevelance of 4-16% for physical abuse, around 10% for emotional abuse or different forms of neglect, and 5-10% of sexual abuse experienced by girls and up to 5% for boys (Cohen et al., 2017). Miano and colleagues (2018) mention prevelance rates "from 6% to 36% for sexual and 16% to 40% for other forms of childhood maltreatment like physical abuse or neglect" (Miano, Weber, Roepke, & Dziobek, 2018, p. 309).

Childhood trauma, as described above, is usually a complex form of trauma as it involves repeated exposure to such events in critical periods of children's development (Kliethermes et al., 2014). For this reason, it can lead to various deficits in the development of personality, interpersonal relationships and trust. Besides, it can obstruct the acquisition of a secure attachment style, as well as adaptive emotional regulation strategies and cognitive abilities. Further, it might affect biological components increasing the risk for diseases (Kliethermes et al., 2014). As mentioned earlier, it can also change the perception of the self and others and lead to various psychological problems. These include aggressive and violent

behavior, depressive, dissociative, and psychotic symptoms, major depression, bipolar disorder, borderline personality disorder, PTSD, eating disorders, somatic concerns, and suicidality (Greenberg et al., 2018; Maercker, 2013). Especially, the earlier, longer and severe forms of maltreatment are more damaging and have a strong impact on a person's biopsychosocial development and later functioning in the different cognitive, emotional and social domains (Kliethermes et al., 2014; Maercker, 2013; Miano et al., 2018). This is because such an environment is not a safe place with opportunities for the child to develop properly (Locher, Barenblatt, Fourie, Stein, & Gobodo-Madikizela, 2014). In terms of social problems, intimate relationships might get avoided, social isolation may occur, or a lot of conflicts when a relationship is entered, due to a deficit in social skills (Maercker, 2013).

1.3 Empathy

The global construct of empathy does not have a consistent definition yet, since researchers seem to not find common ground on what really comprises this attribute (Coll et al., 2017). In the following, the most important general components will be summarized. Mark H. Davis, who created the Interpersonal Reactivity Index (IRI), which is a popular questionnaire to assess a person's empathy, used the following definition. He described it as the "reactions of one individual to the observed experiences of another" (Davis, 1983, p. 113). Further, empathy encompasses caring thoughts and feelings of concern as well as negative feelings from observing discomfort in others (Keaton, 2017). It includes being aware of other people's feelings, to identify, understand and feel them as well (Schaub, 2015). Empathy can also be described as "the capacity to resonate with another person's emotions" (Oliveira-Silva & Gonçalves, 2011, p. 201). An important part of the construct is, however, that the person experiencing empathic feelings can distinguish whether the source of this emotional experience lies within themselves or is merely a reflection of the observed thoughts and feelings of another person (Schaub, 2015). In general, authors are at consent over its importance for interpersonal relations (Chrysikou & Thompson, 2016; Parlar et al., 2014). For example, it is linked to compassion and altruism (Cassidy, Stern, Mikulincer, Martin, & Shaver, 2018). Changed or decreased empathy can affect social relations in many ways (Schaub, 2015).

Various researchers have tried to identify the elements of empathy that further divide the construct into different components. A common division is based on affective and cognitive parts of empathy. According to Feshbach (1978) these affective and cognitive

processes work collaboratively in forming empathy. Cognitive empathy is understood as perspective taking and awareness of the internal state of another individual without necessarily being emotionally affected (Blair, 2005). It involves emotion processing in a conscious manner (Chrysikou & Thompson, 2016). Therefore, cognitive empathy appears to be strongly related to the Theory of Mind construct, which reflects the ability to understand and differenciate someone else's feelings, desires, thoughts and beliefs from one's own and knowing that these do not have to be the same (Baron-Cohen, 2001; Boag & Carnelley, 2016). According to Boag and Carnelley (2016), theory of mind is a requirement for empathy. In contrast, emotional or affective empathy is characterized as the emotional experience of the affective state of another individual (Buruck, Wendsche, Melzer, Strobel, & Dörfel, 2014). It is thought to be a more unconscious experience of sharing emotions of others including "personal distress, affective responsiveness, and emotional contagion, and can be characterized as one's 'gut reaction' to emotional stimuli" (Chrysikou & Thompson, 2016, p. 769). Up to this point, there is no clear behavioral distinction between the two types of empathy, making it difficult to assess the construct. In recent years, it was consistently argued that research does not sufficiently support the two-factor model (Chrysikou & Thompson, 2016).

Overall, it can be said that there is still no agreement on a general, as well as an operational definition of empathy and its implementation. This is due to the complexity and multidimensionality of this construct, which is further reflected in the various definitions across researchers and the disagreement on how to operationalize the construct best (Loinaz, Sánchez, & Vilella, 2018). Recently, researchers advocate for new approaches to the study of empathy, as there is no completely satisfying measurement (Coll et al., 2017).

Nevertheless, after long considerations regarding an appropriate measure for the general expression of empathy, independent of a specific situational context, it was decided to keep the study more comparable to existing literature by using the established Interpersonal Reactivity Index (self-report questionnaire; find a detailed explanation in the Methods section of this thesis).

1.4 Empathy and Trauma: Previous Research

Trauma and impaired empathy

Some studies have found a relation between trauma and lowered empathy. According to Lord (2013), childhood trauma is connected to lower empathy in general, as well as more insecure attachment (this conclusion was drawn on basis of her literature review).

When looking at impairment in different facets of empathy the following was found. Grimm and colleagues (2017) investigated a sample of 541 individuals (with an age range of 18 to 90 years) regarding the interaction between early life stress and empathy, amongst other variables. The Childhood Trauma Questionnaire (CTQ) was used to measure early life stress. Empathy was assessed via the Multifaceted Empathy Test (MET) and the Empathy Quotient (EQ). With regard to empathy and trauma, the authors concluded that severe stress in early life and decreased emotional empathy are associated. This did not hold for cognitive empathy, however (Grimm et al., 2017).

In a study by Mazza and colleagues (2015) people with PTSD symptoms also showed decreased implicit (arousal ratings) and explicit (rating of empathic concern) emotional empathy, but not cognitive empathy. In specific, they looked at the functional brain correlates. The seventeen participants underwent a variety of screening measures and questionnaires, including the EQ and the MET for empathy (Mazza et al., 2015).

On the other hand, Parlar and colleagues (2014) only found impairment in cognitive empathy (comprising the facet of perspective taking of the IRI) and not emotional empathy (the facet of personal distress) in women with PTSD related to trauma in childhood. Since not all subscales (e.g. fantasy) showed a reduction in empathy, they concluded that in this group of people it is altered rather than reduced. They also stated that attachment might have a stronger impact on the outcome variable than PTSD and childhood trauma symptoms. In total, the study emcompassed twenty-nine women with PTSD and twenty healthy controls (Parlar et al., 2014).

Nietlisbach et al. (2010) also conducted a study regarding empathic abilities in people who suffered from PTSD (sixteen participants) compared to nontraumatized individuals (sixteen participants). The theoretical foundation regarding the concept of empathy was based on subdividing the construct into the following three components: besides emotional and cognitive empathy, empathic resonance was included. This part of empathy is a nonreflective bottom-up mirroring of others that serves as the input for the other components, as it is the "basis for sharing the physiological and emotional states of others" (Nietlisbach, Maercker, Rösler, & Haker, 2010). It was expected that empathic responding would be reduced in

people with PTSD. Only the more basic component of empathic resonance (measured as contagion of yawning and laughing) was impaired, however. Findings for cognitive empathy (mind-reading and faux pas recognition) were non-significant. This points to the conclusion that the "more complex processes seem preserved" (Nietlisbach et al., 2010). In regard to the results of the IRI cognitive empathy (subscales perspective taking and fantasy) did not differ much in people with or without PTSD either. Personal distress was elevated in people with PTSD, however. This can be seen as stress contagion. "The findings of unimpaired empathic concern combined with increased personal distress in the PTSD group suggest that the nonreflective perception of social emotional content may be intact and that the reduction of observable resonance may be the result of top-down suppression" (Nietlisbach et al., 2010).

One of the few studies, which investigated the topic of whether childhood maltreatment has an adverse effect on empathy, up to this point, also divided empathy in similar three components as Nietlisbach and colleagues (2010). This study by Locher and colleagues (2014) investigated affective empathy, including emotion matching (imitating the emotion of someone else) and empathic concern (like sympathy), and cognitive empathy (understanding someone else's mental state). The authors explored empathic responses to film clips both quantitatively (through rating of emotional responses: empathy, sadness, anger, and shame) and qualitatively (13 open-ended questions regarding emotions experiences and thoughts) among three groups of varying degree of childhood trauma experiences (based on results on the Childhood Trauma Questionnaire; Locher et al., 2014). It was concluded that trauma in childhood was related to impaired empathy in their sample. However, a difference was found between people exposed to moderate or severe trauma. Adults with moderate abuse experiences in their childhood had lower empathy (shown on the quantitative and the qualitative measure) compared to a control group. People who were subjected to severe maltreatment showed no differences in empathy (compared to the control group) on the quantitative measure. They did, however, exhibit a lower degree of empathy on the qualitative measure. Therefore, the severe trauma group showed higher levels of empathy than the moderate trauma group on the quantitative measurement. In both groups, cognitive empathy was reduced and in individuals with moderate abuse experience emotional empathy and emotional distress values were also reduced. Therefore, the severity of traumatic experiences also has an influence on the amount of empathy a person shows. These differences in the maltreatment groups could be due to other influencial variable (e.g. emotion regulation and attachment). The reduced empathic response in participants with moderate trauma experiences could be a result of emotional blunting through overcontrolled emotion

regulation, avoidant attachment or avoidance of distressing stimuli. Individuals in the severe trauma group showed unusually high affective responses, which could be explained by increased emotional distress through difficulties with emotion regulation, attachment anxiety, or low emotional avoidance (Locher et al., 2014).

Millwood (2011) investigated empathic understanding in couples with female survivors of sexual abuse. In this study, women who experienced sexual trauma were less empathically accurate than a control group (of women without such experiences). This refers to the accuracy with which they were able to deduce the right feelings of others. Their partners, however, were more empathically accurate. A negative correlation between emotional numbness and empathy was also observed, but no influence of PTSD symptoms on empathic accuracy (Millwood, 2011).

No major differences in empathy in connection to trauma

In 2015, Schaub did not find a significant effect of traumatic experiences on general empathy (emotional and cognitive empathy based on the IRI). Notably, the study did not specifically focus on childhood trauma (Schaub, 2015). People that experienced traumatic events did not differ in empathy from those who did not. Nevertheless, people with higher PTSD symptoms showed higher emotional empathy. This is, however, a contradicting finding to existing literature. In the few studies available to date, the predominant assumption is that emotional empathy is impaired by traumatic experiences and PTSD (Nietlisbach et al., 2010). As soon as the cognitive component was included (perspective taking), as it was the case with overall empathy, there were hardly any significant results in the study by Schaub (2015). When results were investigated on a subscale level, it became apparent that personal distress was likely to play the leading role in terms of increased emotional empathy. The latter seemed to be mainly responsible for the differences found (Schaub, 2015). It is questionable, however, whether personal distress considered alone is even meaningful in this context of empathy. When calculating general empathy, personal distress was not included. This can explain the non-significant findings regarding general empathy. Higher emotional concern, however, also showed a relation to the heightened PTSD symptomatic, even though not in the same degree as personal distress. These results were also inconsistent with the findings of Nietlisbach et al. (2010), as mentioned above (Schaub, 2015).

Trauma and elevated empathy

A different explanation for the findings of the possible increase in empathy after traumatic experiences is that such events elevate a person's emotional attentiveness. This could also influence how that person tends to emotions in his/her environment. That, in turn, can lead to an improved emotion recognition and understanding of other people (Greenberg et al., 2018).

In 2018, Greenberg and colleagues also found experiences of traumatic events (in childhood) to elevate trait empathy (measured with the EQ) in their sample. They argue for the opportunity of personal growth after a trauma (posttraumatic growth) leading to more compassion and prosocial behaviors. This connection between the exposure to traumatic events and positive life changes, including personal growth, was already mentioned by Frazier and colleagues in 2013. In their study with sexual assault victims, they defined personal growth as including the development of positive qualities, such as being more mature, a new kind of spiritual or philosophical state of mind and more fulfilling relationships (Frazier et al., 2013). In general, "the most common positive life change reported by sexual assault survivors is increased empathy for others in similar situations" (Frazier et al., 2013, p. 288). This might also explain the findings of increased prosocial behaviors, such as helping others. The higher the quantity of traumatic events the higher the amount of prosocial behaviors (Frazier et al., 2013).

Further, Lim and DeSteno (2016) pointed out that empathy would actually mediate the relationship between severity of past adversities and increased compassion (Lim & DeSteno, 2016). These studies on elevated empathy underline the idea that there are not only negative effects of trauma exposure and that such psychological improvements can occur by dealing with the traumatic experience and learning from it (Greenberg et al., 2018).

To summarize, research on the connection between traumatic experiences in childhood and empathy has provided contradicting evidence regarding the direction of the association (ranging from positive to negative or no effects all in all), leaving many questions unanswered.

1.5 The Related Constructs of Attachment and Emotion Regulation

One way to explain these contradicting results is through other variables impacting the relationship between childhood trauma and empathy. A possible influence could be the

attachment style of a person that showed a relation to the main variables in many studies (e.g. Cassidy et al., 2018; Cohen et al., 2017; Lord, 2013). A second factor that needs to be considered is emotion regulation. Deficits in this ability might develop after adverse experiences in childhood and could in turn influence empathic skills (Maercker, 2013; Troyer & Greitemeyer, 2018). Accordingly, Mikulincer and Shaver already mentioned in 2007 that a secure attachment style can positively affect emotion regulation abilities and in turn influence mental health and social abilities (e.g. social attitudes, prosocial behavior) in a positive manner (Mikulincer & Shaver, 2007). An insecure attachment style and impaired emotion regulation abilities are associated with mental and physical health problems (Oehler & Psouni, 2018).

1.5.1 Attachment

Definition

Attachment is an important construct in developmental psychology, that was first used to describe the relationship between primary caregivers (usually the mother, but also the father, siblings or grandparents) and their children, and was then found to be of interest in other areas, conceptualizing interpersonal relationships in adulthood as well (Williams, Brown, McKenna, Beovich, & Etherington, 2017). The concept of attachment styles was first introduced by Bowlby in 1969 (Cassidy et al., 2018). It includes the idea that the relationship with our primary caregiver guides the development of internal representations about what to expect from other people. These so-called working models (about ourselves and others) shape our expectations regarding the availability of others and influence how we behave in relationships (Collins & Read, 1990; Graham & Unterschute, 2015). Together with individual temperament and the sociocultural environment, attachment styles are formed and continue into adulthood (Oehler & Psouni, 2018). They can change over time, however, due to new relational experiences with close others. Usually, they show a relationship-specific pattern, in the sense that people can be securely attached to one person but have a different general attachment (e.g. insecure attachment) in other relationships (Mikulincer et al., 2001; Oehler & Psouni, 2018; Williams et al., 2017).

Literature mostly groups attachment into the following four types: secure, preoccupied, fearful-avoidant and dismissing-avoidant (Collins & Feeney, 2004). The secure attachment style is characterized by the most adaptive development. Generally, individuals with this type have more fulfilling relationships, characterized by care, warmth, comfort and trust. Besides, they are more comfortable to confide in or depend on others (Fraley & Shaver,

2000; Graham & Unterschute, 2015; Hazan & Shaver, 1987). Through their more positive attitudes they can deal with challenging situations more adaptively (Mikulincer & Shaver, 2015). The other three types belong to the domain of insecure attachment. The preoccupied attachment style is characterized by constant worries about abandonment and rejection by loved ones. These individuals doubt that others will be there to provide comfort and help when needed. They are very sensitive, desire closeness and intimate connections to important others. People with fearful-avoidant attachment have difficulties with opening-up and letting others close, because they fear rejection. Dismissing-avoidant individuals act as if they do not care about close relationships at all. They believe that others are unreliable and tend to keep their distance. This is thought to be a form of protection from disappointment (Collins & Feeney, 2004).

The different styles of attachment have two underlying dimensions (Collins & Feeney, 2004). The first dimension is attachment-related anxiety and indicates the degree of fear someone feels regarding rejection and abandonment by loved ones. The second dimension of attachment-related avoidance shows how comfortable a person is with closeness and dependency (Fraley & Shaver, 2000). People with secure score low on both dimension, preoccupied individuals score high on anxiety and low on avoidance, dismissing-avoidant people score low on anxiety and high on avoidance, and fearful-avoidant individuals score high on both dimensions (Collins & Feeney, 2004). Currently, the dimensional assessment of adult attachment is used more frequently, as it provides a continuous representation of attachment styles. In this way, people are not classified into categories and the personal variations and individual levels can be assessed in more detail (Collins & Feeney, 2004; Fraley & Shaver, 2000; Graham & Unterschute, 2015).

Connection to trauma and empathy

Research has shown that being exposed to traumatic experiences in childhood can also influence how we attach to or bond with primary caregivers and close others later in life (Cohen et al., 2017). According to Kliethermes and colleagues (2014), insecure attachment develops in about 90% of victims of maltreatment in childhood (Kliethermes et al., 2014). In turn, insecurely attached individuals (both axiously and avoidantly) show a negative association with compassion towards others (Mikulincer & Shaver, 2007). When confronted with other people's distress, however, these two types differ in their reactions (even though both belong to the insecure attachment domain). People with avoidant attachment are likely to show more distance when people are distressed or in need. This could make them show less

empathy or altruistic caregiving behaviors. In 2016, it was shown that empathy and compassion are reduced in people with more avoidant attachment (Boag & Carnelley, 2016). Attachment anxiety, on the other hand, leads to self-focused negative affect or distress and increased worries about being socially accepted. This can sometimes make them come across as responding in an empathic manner even though it does not necessarily result in actual supportive behavior (Mikulincer, Shaver, Gillath, & Nitzberg, 2005). Furthermore, it does not mean that those individuals actually understand what other people feel and think (Boag & Carnelley, 2016). Anxiously attached individuals even seem to be less able to take other people's perspective, which is an important part of empathic responding (Troyer & Greitemeyer, 2018). Securely attached individuals display a more positive self-concept and mental representations of others than insecurely attached individuals. Therefore, they are more comfortable with closeness, perceive others as deserving of sympathy and more readily provide them with help and support (Cassidy et al., 2018). In fact, secure attachment facilitates empathy (Cassidy et al., 2018; Troyer & Greitemeyer, 2018; Williams et al., 2017). Therefore, studies on empathy should also always include the construct of attachment (Williams et al., 2017).

Repeated traumatization and the absence of a secure attachment relationship with primary caregivers can also interfere with the development of adaptive emotion regulation strategies (Maercker, 2013). Results of a study by Panfile and Laible (2012) suggest that attachment security predicts empathy through the mediation of emotion regulation. More securely attached children and adolescents appear to be more empathic because they show better emotion regulation skills (Panfile & Laible, 2012).

1.5.2 Emotion Regulation

Definition

In general, it is believed that there are different strategies that people use to regulate and cope with their emotions. Some of these might be executed in a conscious manner and others happen automatically and unconsciously. People can control the kind of emotions they exhibit, which may be beneficial or also show adverse effects (Gross & John, 2003).

Gross (2001) distinguished between two kinds of emotion regulation processes: antecedent-focused and response-focused processes. The former can change the behavioral responses to a stimuli before it even gets activated and occurs. The latter come into effect when these response tendencies and their emotions are already generated (Troyer &

Greitemeyer, 2018). They just alter the behavioral expression in a later stage of the emotion formation (Gross & John, 2003). In his research, Gross (2001) investigated two specific strategies, namely (expressive) suppression and (cognitive) reappraisal (Troyer & Greitemeyer, 2018). Reappraisal belongs to the antecedent-focused emotion regulation strategy (Gross & John, 2003). It affects the kind of meaning people attach to a specific event and allows not only to control the behavioral response, but also the emotions that a person feels inside or shows to the world. In interpersonal relationships, reappraisers connect more deeply with others as they are also more balanced with their own feelings (sharing positive and negative ones). They exhibit greater well-being and less feelings of depression. Suppression, on the other hand, is response-focused, controlling the behavioral expression. People suppressing their emotions experience less positive and more negative emotions because what they feel inside is not the same as what they express to others (Gross & John, 2003). This incongruency can make them feel like they are being inauthentic. Further, suppressing their real emotions can negatively affect their actual behavior in the situation. In the social context, this leads to less intimate and close relationships, since they are less likely to express and share positive as well as negative emotions. Suppressors show more negative outcomes in terms of well-being, life satisfaction, relationships and depression. Suppression can of course also be an adaptive reaction to a situation that evolves faster than it can be cognitively processed through another strategy. Nevertheless, it can have more negative implications on every day functioning in the interpersonal and emotional domain when emotional expressions are just suppressed rather than dealt with (Gross & John, 2003).

Connection to trauma and empathy

It was found that trauma survivors experience various emotion regulation deficits, such as difficulties with emotion recognition and labeling, as well as a decreased tolerance for negative emotions. They use dysfunctional emotion regulation strategies (such as suppression or selfharming behaviors) more often and show problems with impulse control (Maercker, 2013). When a child grows up in a safe and caring home, healthy neurobiological development is fostered, leading to a more adaptive functioning, in general, and better emotion regulation, in specific (Williams et al., 2017).

According to Troyer and Greitemeyer (2018), a secure attachment style leads to less negative emotions and helps individuals to cope with their emotions more adaptively. This, in turn, is said to positively impact people's responses to others, like being more empathic when someone else is upset (Troyer & Greitemeyer, 2018). In their first study the association

between the independent variable of secure attachment and the dependent variable of cognitive empathy was mediated by the emotion regulation strategy of reappraisal. Suppression was also connected to independent and dependent variable, but could not be established as a mediator. People with a more secure attachment style use reappraisal more often and this in turn makes it possible for them to cognitively empathize with others more as they reflect on their thoughts and feelings. This suggests that while growing up they learned to adaptively regulate their emotions from their caregiver while growing up. Furthermore, decreased affective empathy was found in individuals with a dismissing attachment style, probably because they regulate their affective state through suppression. In this study, experimentally enhanced attachement security did not influence empathic responding (Troyer & Greitemeyer, 2018).

Overall, we can conclude that attachment and emotion regulation play a role in the expression of empathy. However, these two variables are definitely just two of many factors that influence how someone responds to the emotions, problems and needs of another person (Troyer & Greitemeyer, 2018).

1.6 Attachment Security Priming (Intervention)

Trauma is associated with reduced attachment security, which in turn influences other domains (Kliethermes et al., 2014). It is therefore possible that an intervention, which strengthens someone's sence of attachment security can have positive effects on a person's functioning, well-being and also on empathy (Gillath & Karantzas, 2019).

In psychology research, security priming as a technique to experimentally induce feelings of safety, comfort and care (that would usually be elicited by an attachment figure) gained attention in recent years (Gillath & Karantzas, 2019). It is thought to increase behavior, thoughts and emotions usually adapted by people that have a secure attachment disposition (Gokce & Harma, 2018).

It is a method based on general priming that makes certain images or memories more accessible by confronting a person with a certain stimulus. This „exposure to a stimulus influences response to a later stimulus. It can occur following perceptual, semantic or conceptual stimulus repetition" (Hsu & Schütt, 2012). In this sense, security priming is expected to beneficially influence an outcome variable (like empathy, in our case). It is an increasingly used experimental manipulation in anglophone countries. Its discussion might be

complicated in the German-speaking countries, however, as there is no direct or simple translation of "Security Priming" to German.

Mikulincer, Shaver and Horesh (2006) were able to show that traumatized individuals (with PTSD) respond favorably to security priming. It was also found to influence the occurance of PTSD in people that had to experience a traumatic event (Mikulincer & Shaver, 2007).

Security Priming Procedure

There are different ways to elicit security priming. In general, security priming causes the activation of mental representations of attachment figures, which evokes feelings of comfort and safety (Mikulincer, Shaver & Rom, 2011). In their review, Gillath & Karantzas (2019) name various techniques that researchers developed to prime attachment security. Some of them are executed subliminally by priming participants to words that evoke feelings of security (e.g. love, hug, support) and some of them are conducted supraliminally, for example, by asking participants to deliberately recall a positive memory of being supported lovingly by an attachment figure. According to the authors, guided imagery or visualization of a security enhancing interaction achieve the best results in various settings (Gillath & Karantzas, 2019). In this type of contextual activation (priming) people often have to write about a person that they turn to in times of need (an attachment figure that makes them feel safe) and describe a situation in which that person was there for them and showed support (Boag & Carnelley, 2016). This kind of intervention makes participants in the priming condition react more like people with a secure attachment style (Boag & Carnelley, 2016; Mikulincer et al., 2001).

Security priming effects in general and regarding empathy

Gillath and Karantzas (2019) published a systematic review investigating the general effects of security priming in a diverse set of domains and „significant associations were reported between security priming and outcome variables in 95% of studies“ (Gillath & Karantzas, 2019, p. 92). Security priming positively affected variables, such as response inhibition and emotion regulation. It led to more positive affect, greater compassion or altruism and less prejudice or hostile attitudes in response to out-group members (Gillath & Karantzas, 2019). In regard to emotion regulation, suppression and rumination were decreased (Gillath & Karantzas, 2019). Three studies investigated the effects of a security priming intervention on empathy and perspective taking (a part of cognitive empathy). Results

regarding these outcome variables were contradictory, however. In one study (by Troyer & Greitemeyer, 2018) security priming yielded no association with empathic responding, whereas the other two studies (by Boag & Carnelley, 2016) found security priming to enhance empathy-related processes (empathy, empathic concern, perspective taking). The other outcome variables of the studies included in this review showed more consistent positive findings (Gillath & Karantzas, 2019). The review solely included published studies from the past two years, however. Besides, it is possible other studies showing non-significant results remained unpublished. Therefore, the findings of this review regarding the general effectiveness of security priming need to be addressed with caution (Gillath & Karantzas, 2019).

Earlier studies on security priming have also found various positive effects, such as an increase in emotion regulation abilities, prosocial behavior, better mental health and more positive attitudes and mood (Mikulincer & Shaver, 2015). According to studies by Mikulincer and colleagues (2011), it can also increase creative problem solving abilities (Mikulincer, Shaver, & Rom, 2011). Carnelley and colleagues (2018) mentioned a release of affective symptoms of depression and anxiety in non-clinical participants after security priming (Carnelley, Bejinaru, Otway, Baldwin, & Rowe, 2018). In another study, security priming was also found to have "a calming, soothing effect in times of stress" (Mikulincer & Shaver, 2015).

Several studies have shown that in the social context, these priming interventions enhance felt compassion and willingness to help someone in need (Cassidy et al., 2018) and show positive effects on empathy (Boag & Carnelley, 2016; Carnelley et al., 2018). Already Mikulincer and colleagues (2001) investigated how attachment security priming influences people's empathic reactions and the degree of personal distress in response to a person in need. They were able to accept their hypotheses and concluded that empathy regarding other people in need can be positively affected by priming, which also causes less activation of distress (Mikulincer et al., 2001).

Priming attachment security in individuals has effects on the cognitive, affective and behavioral level. In general, the changes are not due to positive affect or mood changes only (Mikulincer & Shaver, 2007). In the studies by Mikulincer and Shaver (2001), security priming showed a beneficial effect in comparison to a neutral prime or a positive-affect prime (when the current mood of participants was controlled for; Boag & Carnelley, 2016). It did also positively affect the mood of participants, but these mood changes were not responsible

for the significant effects found for priming. Besides, mood and empathy were not significantly associated (Mikulincer et al., 2001).

Possible Covariates

The contradictory results regarding security priming, as they were found for empathy, can possibly be explained by mediating variables as well (Gillath & Karantzas, 2019). For instance, the attachment style can influence its effectiveness. Therefore, one should be careful with the assumption that security priming is beneficial for all people (Mallinckrodt, 2007). At first, it was believed that the results of the contextual activation of the sense of attachment security are independent of the dispositional attachment style. For instance, research found positive effects on compassion towards other people in individuals with all kinds of attachment, including anxious and avoidant styles (Mikulincer et al., 2005). On the basis of these results, it was concluded that security priming can change the reactions of people with a persistently insecure attachment style to be more caring about the plight of others, similar to individuals scoring high on attachment security (Mikulincer et al., 2005). However, more recent research concluded that supraliminal security priming is especially beneficial for people that exhibited anxious attachment. Individuals with avoidant attachment do not seem to benefit from this kind of priming in the same way. This could be due to the fact that those people have stronger difficulties to recall security-enhancing interactions because of their defense mechanisms (Gillath & Karantzas, 2019).

In the review by Gillath and Karantzas (2019), it was reported that six out of nine studies on security priming found a moderation effect of attachment. Five of these six studies showed results in the hypothesized direction. Highly anxious people react more positively to security priming and benefit more than individuals with lower scores on this dimension. One study, on the other hand, found a negative association, which was actually contrary to the hypothesis. Namely, paranoid thinking was elevated in anxiously attached people through the priming intervention. Two studies that found a connection in the expected direction established avoidant attachment as a moderator (Gillath & Karantzas, 2019). For example, according to Bryant and Chan (2017), people with avoidant attachment reacted to positive images with less positive emotions than people scoring low on this attachment dimension after security priming was conducted. Another study (by Pan et al., 2017), which investigated the reactions to the perception of other people's pain (shown in images), found an association between priming, avoidant attachment as well as anxious attachment (three-way interaction). People scoring high on both attachment dimensions (anxiety and avoidance) reported a higher

pain intensity in response to images showing the pain of someone else when primed with attachment security (Gillath & Karantzas, 2019).

Repeated and location-independent priming

The priming of a secure attachment model can make people feel more secure and less distressed (Gillath & Karantzas, 2019). Effects of a single security priming intervention are thought to be only temporary, however. Nevertheless, there is some evidence of long-lasting effects of repeated priming (Carnelley et al., 2018; Mikulincer & Shaver, 2007). To investigate repeated security priming, Oehler and Psouni (2018) used a location-independent prime through mobile security priming. In their study, they wanted to see whether effects could be achieved when priming was carried out in different settings. External influences during the priming procedure cannot be ruled out, however, since the study did not take place in a controllable laboratory setting. Nevertheless, promising results were achieved for mobile security priming. "Visualizing positive attachment security situations for seven consecutive days resulted in reduced self-reported attachment avoidance and reduced perceived stress and increased self-compassion, assessed one day after the week-long exposure" (Oehler & Psouni, 2018). It had no influence on secure and anxious attachment, however (Oehler & Psouni, 2018).

2 Research Question and Hypotheses (Aim of the study)

All in all, effects of security priming on empathy (as well as the connection between childhood trauma and empathy) are still inconclusive. Therefore, the current study aimed at investigating the relationship between the different variables (childhood trauma, empathy and attachment security) to answer the following question constituting the full research model:

In which way does security priming influence general empathy in people that score high on a measure of childhood trauma experience (severe trauma group) in comparison to people that score low on it (low trauma group)?

The following research questions and hypotheses were derived from this:

- **Research question 1:** Is there a general association between childhood trauma experiences and empathy?

Hypothesis 1: The severe trauma group (including people that experienced severe childhood trauma and therefore scored high on the CTQ) will score lower on general empathy than people in the low trauma group (showing low scores on the CTQ).

- **Research question 2:** Do different types of traumatic experiences in childhood have different effects on empathy?
  Hypothesis 2: The different types of trauma (emotional abuse, physical abuse, sexual abuse, emotional neglect and physical neglect) will have a different strength in impacting empathy.
- **Research question 3:** Does security priming have an effect on general empathy?
  Hypothesis 3: Security priming will increase general empathic responses in both trauma groups.
- **Research question 4:** How are the covariates attachment (anxious, avoidant) and emotion regulation abilities (reappraisal and suppression) related to empathy?
  Hypothesis 4: More anxious and avoidant attachment will be associated with lower empathy and the emotion regulation abilities of higher reappraisal will be related to higher empathy, whereas higher suppression to lower empathy.
- **Research question 5:** Full model: In which way does security priming influence general empathy in people that score high on a measure of childhood trauma experience (severe trauma group) in comparison to people that score low on it (low trauma group)? Known related constructs, namely attachment style and emotion regulation, will be included as covariates to control for their effects on the connectedness of the main variables (childhood trauma, empathy and the security priming intervention).
  Hypothesis 5: Security priming will be less effective in promoting empathic responses in people that score higher on the CTQ than people that score low on that measure compared to the control group of neutral priming.
- **Research question 6:** Is there a gender difference for the relationship between the variables (Do results differ regarding gender)?
  Hypothesis 6: It is expected that results will be stronger for women.

3 Method

The study was conducted online and administered through the SoSciSurvey platform between February and Mai of 2019. It had an internet-based experimental control design, in

which respondents were randomly assigned to one of the two priming conditions (security and neutral priming) and naturally divided further based on their traumatic experiences in childhood (either severe or low). This led to four groups for the analysis. The concept was approved by the Ethics Committee of the University of Vienna prior to its execution.

Respondents were recruited through social media, as well as different online platforms for people with the following (psychological) interests: empathy, relationship (problems), different psychological disorders (such as depression, anxiety, borderline personality disorder, PTSD), health, childhood, family, as well as self-help groups for people with traumatic experiences.

3.1 Respondents

Inclusion criteria were set on a participation age of 18 years or older. Respondents had to be fluent in German (since the study was conducted in German) and were not allowed to be psychology students who had already completed the second semester. The following demographics were included: gender, age, ethnicity, education, relationship status, and psychological disorders. People with psychological disorders were not excluded from the study since many people that experience childhood trauma also develop some form of mental disorder due to their experiences (Gilbert et al., 2009). In relation to the research question, it was important to investigate a diverse sample with different levels of childhood trauma severity.

To establish the number of respondents that should complete the online study, the computer program G*Power (Faul, Erdfelder, Lang, & Buchner, 2007) was used. According to the results, at least 210 respondents were needed to achieve a medium effect size. To calculate the required sample size, the program asks for certain specifications (effect size, power, alpha, numerator df, number of groups and number of covariates).

The estimation for the effect size Cohen's f was based on Cohen's (1969, p. 348) reference values (small: f = .10; medium: .25; large: f = .40) (Cohen, 1969; G*Power 3.1 manual, 2017). For this analysis, a medium effect size was assumed. In research, the power is usually set to .80 or higher and alpha to .05 or lower. Since in an online study it is easier to obtain a higher number of respondents (which is usually needed for a higher power), the power was set to .95 and alpha to .05 (a power estimate of .80 would have required a sample size of 128; Howell, 2013, p. 237). The numerator df was calculated for the interaction,

resulting in a value of df = 1. In the present study, the number of groups that are compared in the analysis is 4, as well as the number of covariates (G*Power 3.1 manual, 2017).

In total, 377 people participated in the online study. Respondents that did not complete the priming (see explanation of priming conditions below) were exluded post-hoc after study completion, as well as participants that specified they were distracted more often during participation. After exclusion of these invalid cases, 342 valid respondents made up the sample for this study.

In general, the sample included 298 (87.1%) women, 42 (12.3%) men, and 2 (0.6%) 'others' (with gender not specified). 230 (67.3%) respondents were of german nationality, 92 (26.9%) were Austrians, 10 (2.9%) from Switzerland and 10 (2.9%) from other countries. The age of participants had a mean of 30.75 and ranged from 18 to 62 years. Most respondents were either students (29.8%) or employed in a company (31.6%). 57.3% (196 people) indicated not having psychiatric disorders, 9.1% (31 people) had some in the past and 33.6% (115) stated they were currently affected by psychiatric disorders, including (complex) PTSD, depression, anxiety disorders, personality disorders (such as borderline personality disorder), and eating disorders. 19.6% (67 people) were taking psychiatric medication against their disorders during study participation, but 80.4% (275 people) were not. 50% (171 people) of the sample was currently in a serious relationship and 19.3% (66 people) married, whereas 24.9% were indicated to be single.

3.2 Procedure

To start with, participants had to sign an informed consent and answer some demographic questions (age, education, psychiatric disorders, etc.). They were asked to answer the questionnaire in a non-distracting environment and had to finish it in one go. Then, the questionnaires regarding their attachment style (the Experience in Close Relationships-Revised – ECR-R: Fraley, Waller, & Brennan, 2000), childhood trauma experiences (the Childhood Trauma questionnaire – CTQ: Bernstein & Fink, 1998) and emotion regulation strategies (the Emotion Regulation Questionnaire – ERQ: Gross & John, 2003) had to be filled out. After completion of this part, they were randomly assigned to either the attachment security priming or the neutral priming condition, which represented the control group. Finally, their level of empathy was assessed via a validated and widely used empathy questionnaire (the Interpersonal Reactivity Index – IRI: Davis, 1983; called 'Saarbrücker Persönlichkeitsfragebogen' in German).

Priming conditions

As mentioned earlier, participants were randomly assigned to either the security priming condition or the neutral priming condition (control group). Instructions for the priming intervention were based on a study by Mikulincer et al. (2011), but slightly modified to fit the current design. Participants were asked to take a comfortable position and had two minutes to think about a certain person depending on the condition.

In the **security priming condition,** they were instructed to think of a person they turn to for comfort and support. It should be a person that they feel secure with. Two minutes had to be used to think about positive memories and feelings regarding that person. Afterwards they had to name 6 positive qualities of this individual and describe a specific situation in which they had received his or her comfort or support (in a few words or sentences).

In the **neutral priming condition,** participants received the instruction to think of an accaintance that they do not think about very much and that they have neutral feelings (or no strong feelings) for. They were asked to describe an ordinary situation with that person, where nothing exceptional happened.

3.3 Materials

3.3.1 Childhood trauma

Participants completed the German version of the Childhood Trauma Questionnaire (CTQ; Wingenfeld et al., 2010) that was originally introduced by Bernstein & Fink in 1998 and developed into a shorter version in 2003 (Bernstein & Fink, 1998; Bernstein et al., 2003). The CTQ is a 28-items retrospective self-report measure, in which participants answer questions regarding various maltreatment experiences on a five-point Likert scale ranging from 1 (*never true)* to 5 (*very often true).* Traumatic experiences in childhood are divided into the following five subscales: emotional abuse, physical abuse, sexual abuse, emotional neglect and physical neglect. Example items are: “People in my family called me things like ‘stupid’, ‘lazy’, or ‘ugly’” (emotional abuse); “I got hit or beaten so badly that it was noticed by someone like a teacher, neighbor, or doctor” (physical abuse); “Someone tried to touch me in a sexual way or tried to make me touch them” (sexual abuse); “There was someone in my family who helped me feel that I was important or special” (reversed item of the emotional neglect sub-scale); “I didn’t have enough to eat” (physical neglect; see Appendix C for the complete questionnaire). The internal consistency (cronbach’s alpha) of the subscales on

emotional, physical and sexual abuse was shown to be high (α = .84 to .92) and strong test-retest reliabilities (α = .87 to .96) were found in an undergraduate student sample (Paivio & Cramer, 2004). In the current study, the internal consistency of the whole scale was α = .92 and the inter-item correlations ranged from -.85 to .96 (with a mean score of .32).

A total score of the trauma experiences (all CTQ items) was calculated by summing up all the items of the scale. Participants were divided into two groups, the severe trauma group and the low trauma group, based on their CTQ total scores. The severe trauma group consisted of all participants scoring above the cut-off point of 51 and the low trauma group of participants having a score up to that cut-off point (low trauma group until 51; trauma group from 52). This division was based on a classification table by Bernstein and Fink (1998) that groups people according to the severity of their maltreatment experiences on each subscale (see Appendix G for the classification table).

In the current sample, the subgroups show very similar mean scores on empathy. A division of the groups based only on the lowest and highest quartile did not make them more different, however. Besides, it led to a very unequal group division, since there are far more people with severe traumatic experiences and only 5 people with no trauma in this sample. Excluding all people between the outer quartiles would have also disregarded everybody with scores in the middle range from the analysis. Therefore, the division based on the cut-off point of 51 was retained.

3.3.2 Empathy

The "Saarbrücker Persönlichkeitsfragebogen" (SPF) was used to measure participants' empathy (Paulus, 2009). It is the German version of the Interpersonal Reactivity Index (IRI; Davis, 1980). In this study Version 5.8 was applied (Paulus, 2012). The questionnaire is a self-report scale including 28 items scored on a 5-point Likert scale from 1 (*does NOT describe me well*) to 5 (*describes me very well).* The items are divided into four subscales (with 7 items each): perspective taking, empathic concern, personal distress and fantasy.

Perspective taking measures the ability to take another person's point of view on a cognitive level. Empathic concern includes feelings of sympathy and concern for someone else. Personal distress assesses discomfort or anxiety in emotional or tense interpersonal situations as well as in response to another person's problems or distress. Fantasy measures the ability to relate to fictional characters in movies or books and feel what they feel (Davis, 1980). Example items are: "I sometimes try to understand my friends better by imagining how things look from their perspective" (perspective taking); „I often have tender, concerned

feelings for people less fortunate than me“ (empathic concern); „I sometimes feel helpless when I am in the middle of a very emotional situation“ (personal distress); „I really get involved with the feelings of the characters in a novel“ (fantasy; see Appendix D for the complete questionnaire).

The IRI is the most widely used questionnaire on empathy (Paulus, 2009; Keaton, 2017). According to Keaton (2017), it is a valid and suitable measure of this construct. However, „like all self‑report scales, the IRI potentially suffers from reporting biases“ (Keaton, 2017, p. 344). Subscales of the IRI can further be divided into cognitive and affective empathy. Researchers have found very different results regarding which of the IRI scales constitute these two categories. Chrysikou and Thompson (2016) challenged the validity of the two-factor structure of the IRI (the original four-factor model of Davis has a better fit). Moreover, it is questionable whether the distinction between these two sub-components of empathy is even accurate and meaningful (Chrysikou & Thompson, 2016; Coll et al., 2017). Therefore, it was decided to focus on general empathy in this study. According to factor analysis only perspective taking, fantasy, and empathic concern make up the general empathy factor and personal distress is a factor on its' own (Chrysikou & Thompson, 2016). Thus, summing up the three subscales (empathic concern, perspective taking and fantasy) forms a total score of empathy in the German version. Inclusion of the personal distress subscale would reduce its sensitivity (Paulus, 2012).

In a study of Koller and Lamm (2015), internal consistencies and item-total correlations for each scale showed similar results in the German version as originally reported by Paulus in 2009. Reliability (cronbach's alpha) ranged from low to moderately high (α = .61 to .73) and item-total correlations from .36 to .60 (empathic concern: r_{it} = .36 to .44; perspective taking: r_{it} = .45 to .52; fantasy: r_{it} = .47 to .60; personal distress: r_{it} = .45 to .52) (Koller & Lamm, 2015). The internal consistency (cronbach's alpha) of the total scale was α = .72 in the current study and the inter-item correlations ranged from -.36 to .68 (with a mean score of .15).

3.3.3 Attachment style

The Experience in Close Relationships-Revised Questionnaire (ECR-R; Fraley et al., 2000) is a measure of attachment style in which participants are scored on a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The scale was translated to the German language by Brennan and colleagues in 1998 and further evaluated by Ehrenthal,

Dinger, Lamla, Funken, and Schauenburg (2009) that acknowledged its outstanding psychometric qualities (Brennan, Clark, & Shaver, 1998; Ehrenthal, Dinger, Lamla, Funken, & Schauenburg, 2009; Troyer & Greitemeyer, 2018).

The revised version (ECR-R) shows a good reliability, which is quite stable across different studies and sample characteristics, compared to other questionnaires for measuring attachment. Therefore, it also „seems particularly well suited for cross-group comparisons and for applying to samples with atypical compositions“ (Graham & Unterschute, 2015, p. 39). The 36 items give insight in participant scores regarding two dimensions: attachment anxiety and attachment avoidance (18 items each). Anxious attachment includes questions regarding the fear of being rejected or abandoned and avoidant attachment measures how comfortable a person is with being close to others (Pan, Zhang, Liu, Ran, & Teng, 2017). Example item are: “I do not often worry about being abandoned” (anxiety) and “I am very comfortable being close to romantic partners“ (avoidance; see Appendix E for the complete questionnaire). Higher scores on the subscales imply a higher degree of either anxious or avoidant attachment, representing attachment insecurity (Troyer & Greitemeyer, 2018).

According to Troyer and Greitemeyer (2018), the subscales show a reliability (cronbach’s alpha) of α = .93 (avoidance) and α = .92 (anxiety) (Troyer & Greitemeyer, 2018). In the current sample, cronbach’s alpha for the total scale was α = .94 and the inter-item correlations ranged from -.15 to .85 (with a mean score of .31). Cronbach’s alpha for the anxiety subscale was α = .92 and for the avoidance subscale was α = .94. Attachment was included as a control variable (covariate).

3.3.4 Emotion Regulation

The Emotion Regulation Questionnaire (ERQ; Gross & John, 2003) is a 10-items self-report measure assessing emotion regulations on the basis of 2 scales: (cognitive) reappraisal and (expressive) suppression. It is measured on a 7-point Likert scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The German version was developed by Abler and Kessler (2009). The reappraisal subscale consists of six items and measures a person’s ability to control their attention towards certain stimuli. The suppression subscale includes four items on whether people can change the meaning of an emotional stimulus (Ochsner & Gross, 2005). Example items are: „When I’m faced with a stressful situation, I make myself think about it in a way that helps me stay calm“ (reappraisal) and „I keep my emotions to myself“ (suppression; see Appendix F for the complete questionnaire)

Troyer and Greitemeyer (2018) found a Cronbach's alpha of α = .81 for reappraisal and α = .72 for suppression (Troyer & Greitemeyer, 2018). In the present study, Cronbach's alpha was α = .70 for the total scale (the subscales had a cronbach's alpha of α = .76 for suppression and α = .84 for reappraisal) and the inter-item correlations ranged from -.20 to .69 (the mean score was .20). Emotion regulation was included as a second control variable (covariate).

3.4 Statistical Analysis

The data were analyzed using SPSS Version 24 (IBM Corp, 2016). To start with, an overall severity sum score of childhood trauma experiences (including all subscales of the CTQ), the total score of empathy (summing the subscales EC, PT and FS), as well as the attachment anxiety and attachment avoidance dimensions (summing the questions of each scale) were calculated.

For the statistical analysis, participants were divided into two groups on basis of their CTQ scores: a severe trauma group and a low trauma group. Since participants were already assigned to one of the two priming conditions (security priming and neutral priming) during study completion, it generated four groups for the analysis: severe trauma/security priming (75 people), severe trauma/neutral priming (85 people), low trauma/security priming (84 people), low trauma/neutral priming (98 people).

To analyse the data, a 2x2 factorial Analysis of Covariance (ANCOVA) with the factors priming condition (security priming or neutral priming) and childhood trauma (severe or low; according to the CTQ) with empathy as the outcome variable was performed in SPSS. Attachment style and emotion regulation were included as covariates.

4 Results

To begin with, the general assumptions of an ANCOVA were checked, as several conditions have to be met before performing this kind of analysis. Some of the assumptions are assumed to be given on basis of the study design, others are specifically checked through graphs and calculations. The general ANOVA conditions of independence of residuals, group normality and homogeneity of group variances were met. The specific assumptions for an ANCOVA include the covariate measured without error, linearity and parallelism of

regression lines. All in all, these assumptions were sufficiently met to further analyse the data of this sample (keeping in mind minor violations of linearity for suppression and the parallelism assumption for the interaction of childhood trauma and suppression, as well as for childhood trauma and attachment avoidance).

Table 1 depicts all means, standard deviations and the range of answers for empathy (IRI total), childhood trauma severity (CTQ total), attachment anxiety (ECR-R Anxiety), attachment avoidance (ECR-R Avoidance), cognitive reappraisal (ERQ Reappraisal) and expressive suppression (ERQ Suppression), as well as the number of respondents (sample size).

Table 1.

Means, Standard Deviations and Range and Sample Size.

	M	SD	Range	N
IRI total	46.05	7.42	15-60	342
CTQ total	57.29	20.16	35-123	342
ECR-R Anxiety	3.34	1.28	1-6.61	342
ECR-R Avoidance	2.91	1.29	1-6.22	342
ERQ Reappraisal	25.14	7.44	6-42	342
ERQ Suppression	15.51	5.64	4-28	342

Note. M = mean; SD = standard deviation; N = number of respondents (sample size); IRI total represents empathy (sum score including all items); CTQ total represents childhood trauma severity (total sum score including all subscales), ECR-R anxiety and ECR-R avoidance stand for the mean scores on the two attachment dimensions; ERQ reappraisal and ERQ suppression represent the two emotion regulation subscales of cognitive reappraisal and expressive suppression.

Table 2 shows all bivariate correlations of the variables included in the model. The general association between CTQ total and IRI total depicted a non-significant correlation. IRI total was also not significantly associated with ECR-R Anxiety, but significantly related with the other variables (negative correlations with ECR-R Avoidance and ERQ Suppression; a positive correlation with ERQ Reappraisal). CTQ total showed a highly significant positive correlation with both ECR-R Anxiety and ECR-R Avoidance, as well as ERQ Suppression, and a highly significant negative correlation with ERQ Reappraisal.

Table 2.

Bivariate correlations between the study variables.

	1	2	3	4	5	6
1. IRI total	-					
2. CTQ total	-01	-				
3. ECR-R Anxiety	.02	.31***	-			
4. ECR-R Avoidance	-.17**	.52***	.47***	-		
5. ERQ Reappraisal	.30***	-.22***	-.30***	-.28***	-	
6. ERQ Suppression	-.11*	.35***	.20***	.43***	-.07	-

Note. $N = 342$. * $p < .05$, ** $p < .01$, *** $p < .001$
IRI total represents empathy (sum score including all items); CTQ total represents childhood trauma severity (total sum score including all subscales), ECR-R anxiety and ECR-R avoidance are the mean scores of the two attachment dimensions; ERQ reappraisal and ERQ suppression represent the two emotion regulation subscales.

In Table 3, the descriptive statistics of the four study groups can be found. When the mean scores on the empathy scale are investigating for each group, it becomes apparent that they have very similar values. This indicates that the different groups, which are compared in this study, do not differ much on their empathy scores.

Table 3.

Descriptive Statistics of Empathy by Priming and Childhood Trauma.

	Priming							
	Security Priming				Neutral Priming			
Childhood Trauma	M	Adj. M	SD	n	M	Adj. M	SD	n
low	46.67	45.78	.79	84	46.30	45.66	.72	98
severe	45.72	46.45	.85	75	45.46	46.43	.78	85

Note. M = mean; Adj. M = adjusted means; SD = standard deviation; n = number of respondents per group.

To test whether the hypotheses can be accepted, first the ANOVA was performed to check the possible general effect of the independent variables (CTQ group and priming) on the dependent variable (IRI total). This analysis established a non-significant interaction effect regarding these variables ($F = .005$; $p = .946$). Subsequently, the ANCOVA was performed to investigate the full model including the covariates, to see whether these

variables impact the main association. The results of this analysis are depicted in the answer to research question 5 and can also be found in table 4.

In the following section, results of the current study will be presented for each research question separately. Regarding research question 1, the ANOVA showed a non-significant general association between the first independent variable of childhood trauma (whether someone belongs to the severe trauma or the low trauma group - CTQ group) and the dependent variable of empathy (IRI total). Therefore, it can be concluded that the two variables were not significantly related in this sample ($F = 1.22$; $p = .270$) and hypothesis 1 had to be rejected.

To investigate the relationship between childhood trauma and empathy in more detail and to see whether the subscales of the CTQ (different types of childhood trauma: emotional, physical, and sexual abuse, as well as emotional and physical neglect) show different effects on empathy, a multiple regression analysis was performed, answering research question 2. In this analysis, no associations were found between the subscales of the CTQ and IRI total, except for emotional neglect. Therefore, only emotional neglect was significantly associated with the dependent variable (IRI total) in this sample, showing a negative relation ($t = -2.09$; $p = .04$).

The second independent variable of priming (security priming and neutral priming) was also non-significantly related to the dependent variable of empathy ($F = .15$; $p = .696$). Therefore, hypothesis 3 was rejected on basis of the ANOVA, as well.

When investigating how the different covariates are related to empathy (research question 4), a significant association was found between empathy and the covariates ECR attachment anxiety, ECR attachment avoidance and the emotion regulation subscale ERQ reappraisal. The covariate of ERQ suppression was non-significant (Table 4).

Research question 5 investigated the full model of the interaction effect of childhood trauma and priming on empathy, when controlling for the covariates of attachment (anxious and avoidant) and emotion regulation (reappraisal and suppression). Both the interaction effect and the main effects of priming and childhood trauma were non-significant. Results are depicted in Table 4. Therefore, the full model was rejected on basis of the current sample. It can be concluded that people in the different groups do not differ on the measure of empathy and it therefore makes no difference whether someone experienced low or severe trauma and received security priming or a neutral prime.

Lastly, the gender effect in this sample (whether results differed based on gender) was investigated. The ANCOVA for male and female respondents separately showed very similar

results (research question 6). The two respondents that did not identify as man or woman were not considered for this research question. A group size of two was too small to get a valid answer for this group. Female and male participants showed no difference regarding the significance of the main effects of priming and childhood trauma, as well as the interaction (male: F = .207, p = .652; female: F = .001, p = .976). The associations of empathy and the covariates of attachment anxiety and cognitive reappraisal were both significant (ECR-R anxiety: F = 6.638, p = .014 (male), F = 5.849, p = .016 (female) ; ERQ reappraisal: F = 8.591, p = .006 (male), F = 26.228, p = .000 (female)). Attachment avoidance, however, turned non-significant when the sample was divided by gender (ECR-R avoidance: F = .738, p = .396 (male), F = 3.581, p = .059 (female)). Male participants showed a higher non-significance of attachment avoidance than women. Expressive suppression was non-significant in both groups (ERQ suppression: F = .273, p = .035 (male), F = .639, p = .425 (female)).

Table 4.

ANCOVA Summary for Empathy by Priming, Childhood Trauma, Attachment, and Emotion Regulation.

Source	SS	df	MS	F
Priming	.40	1	.40	.01
CTQ group	34.17	1	34.17	.70
ECR-R Anxiety	517.99	1	517.99	10.64**
ECR-R Avoidance	304.61	1	304.61	6.26*
ERQ Reappraisal	1658.87	1	1658.87	34.09***
ERQ Suppression	76.46	1	76.46	1.57
Priming x CTQ group	.26	1	.26	.01
Error	16254.46	334	48.67	

Note. R2 = .13, adj. R2 = .12.
N = 342. * $p < .05$, ** $p < .01$, *** $p < .001$.
SS = sum of squares; df = degrees of freedom; MS = mean square.

Further Analyses

Since results for general empathy were non-significant, the analysis was performed separately for affective (IRI empathic concern) and cognitive empathy (IRI perspective taking) to further compare results to previous studies. However, those two components of empathy did not show significant results when investigated separately either. The interaction

effect of childhood trauma and priming was both non-significant for cognitive empathy ($F = .69$; $p = .409$), as well as for affective empathy ($F = .99$; $p = .322$).

Furthermore, it was investigated whether people in the different groups had a more secure or insecure (avoidant or anxious) attachment style. It is suggested that this could influence the effectiveness of the security priming intervention. In specific, a lot of people with avoidant attachment in the security priming condition could be a possible explanation for why this intervention showed no significant effects in the current study. This idea is presented in the review by Gillath and Karantzas (2019) stating that security priming seems to be less likely to work for people with avoidant attachment as they have difficulties recalling images of attachment security (see introduction of security priming for further explanation of why avoidant attachment can negatively influence priming). To investigate this assumption attachment groups of attachment anxiety and attachment avoidance were formed using a median split of the variables (Troyer & Greitemeyer, 2018). The severe trauma group comprised more people with an insecure attachment style than the low trauma group, which is in line with the literature. There were, however, not conspicuously more avoidantly attached people (or with any other attachment style) in the priming condition.

5 Discussion

5.1 Summary

To sum up, the aim of this study was to investigate whether people with different degrees of childhood trauma would defer on their amount of expressed empathy after an attachment security prime in contrast to a neutral prime. Four groups were compared in the analysis (severe trauma/security priming, low trauma/security priming, severe trauma/neutral priming, low trauma/neutral priming). It was expected that priming attachment security in people that experienced mild trauma in childhood would be more effective in increasing empathy than for people with severe trauma experiences. This assumption is based on various sources that suggest that people with more severe childhood trauma are often less securely attached. In this case, they have more problems with recalling such feelings of security in an attachment relationship, wherefore the priming intervention probably works less well for them (Kliethermes et al., 2014).

In the end, however, the data of the current sample did not support the main hypothesis that the four groups would differ on their level of empathy. This means that people with varying degrees of childhood trauma (low and severe) did not differ on their level of empathic expression. Moreover, the security priming intervention did not show a significantly different impact on empathy compared to the control condition of neutral priming. In total, childhood trauma experiences and priming (independent variables) were not significantly associated with empathy (outcome variable) in this study, also when the covariates (anxious attachment, avoidant attachment, expressive suppression and cognitive reappraisal) that could possibly affect the relationship were included in the analysis. Therefore, it can be concluded that there was no influence of priming on empathy found in the divers study population of people with and without maltreatment experiences in childhood.

Emotional neglect as a subcategory of childhood trauma was negativly related to empathy scores, however. So, people that were emotionally neglected in childhood showed less empathy in this research. Three of the four covariates included in the study also had a significant relationship with the outcome variable, namely anxious and avoidant attachment, as well as the emotion regulation strategy of cognitive reappraisal. Only expressive suppression did not have an effect on the amount of empathy a person experiences.

When results were compared based on gender, no significant differences of the full model were found for male and female participants. Men and women did not show a unique pattern of their reactions on the empathy scale after the security priming intervention regardless of their experiences in childhood.

5.2 Interpretation of Results and future Implementations

When looking at the influence of childhood trauma on empathy, results of this study are in disaccord to various other studies that either found decreased or elevated empathy in people with traumatic experiences or PTSD (not necessary linked to childhood trauma; e.g. Lord, 2013; Grim et al., 2017; Mazza et al., 2015; Locher et al., 2014; Greenberg et al., 2018).

These divers conclusions regarding this topic point to the fact that trauma can influence empathy in various ways. For example, trauma can make people more focused on their own misfortune and decrease their ability to care about other people's problems. On the other hand, however, it can also lead to adaptive changes leading to an improvement in social functioning, including empathic abilities, making the person more understanding and aware towards other people's plight. Additionally, like it was shown in the current study, it can have

non-significant effects on empathy. These results are in line with findings of Schaub (2015), where trauma had no influence on general empathy either. In the study by Schaub (2015), a connection between traumatic experiences and empathy was only found for emotional empathy, but not when the cognitive component (perspective taking) was included, as it was the case with overall empathy. When the data of the current sample were investigated further for both types of empathy separately, no such difference was found. In this study, the focus was put on people with childhood trauma. Therefore, it is not possible to make an immediate comparison to the sample of Schaub (2015) that focused on people with PTSD and did not specify a certain type of trauma.

The following explanation could account for the divers findings regarding the association between the two variables of childhood trauma and empathy. There are probably many different factors influencing the development of empathy and the way people act in social situations in general. Trauma is only one possible influence that just constitutes for a small insignificant effect, which is not as relevant as one might think. In the current study, it could not be confirmed as a pivotal factor. The current research points to the fact that reduced empathy mainly depends on other factors. Consequently, it can be assumed that maladaptive changes after childhood trauma (such as attachment insecurity and emotion regulation difficulties) have stronger effects on empathy than the experience of trauma in itself. This could also explain the disagreement across studies. One such factor could be the attachment style of a person. It is possible that effects of maltreatment (from primary caregivers or people close to the child) can express themselves through the development of a more insecure attachment in an indirect manner. Parlar et al. (2014) also mentioned that empathy is more severely affected by attachment than by childhood trauma. Besides, we know that most people with traumatic experiences develop insecure attachment (Kliethermes et al., 2014).

According to Greenberg et al. (2018), another change that can influence an impairment of social functioning could be the development of mental disorders that manifest themselves after the experience of a traumatic event. Such conditions as well as biological or environmental factors can pivotally impair empathy in people that suffered maltreatment (Greenberg et al., 2018).

In the current study, the following psychological variables were actually confirmed as being associated with empathy: the emotion regulation strategy of reappraisal, as well as both attachment dimensions (anxiety and avoidance). Only trait attachment was related to empathy, however. The attachment security priming intervention did not show a significant effect on the dependent variable.

The study was developed in consideration of inconclusive and contradictory research regarding the efficacy of a security priming intervention to increase empathic responding in adults. This study showed once again that the connection is not as straight forward. The potential of security priming and its effectiveness in increasing empathy were not demonstrated. These findings are in line with the study by Troyer and Greitemeyer (2018) that also did not find a significant effect of security priming. Two other studies (by Boag & Carnelley, 2016), however, found a significant association between security priming and increased empathic responding. Those studies raised the expectation of a positive effect of priming on empathy in the current study.

There are various reasons that could explain the non-significant findings regarding security priming. First, it is possible that the two primes (security and neutral) were too similar to one another as in both priming conditions individuals had to visualize an interpersonal situation. A more neutral prime, involving a shopping experience or questions about their breakfast preferences, might have led to different results.

Secondly, security priming was not conducted in a laboratory setting. This was done to see whether a location-independent prime could work as well. For this reason, however, it was not possible to control for factors in the environment of the participant. To minimize the influence of such factors, participants were asked to complete the study in a quiet space and the declaration of several interruptions during study completion led to an exclusion from the analysis. Other interferences during the priming task were not controllable, however.

Thirdly, the subjective experience during the visualization task (priming) can also affect the outcome. The priming assignment can get people to think of positive experiences, on the one hand, or it can remind them that they do not have such a significant person in their life, on the other hand. Especially, in studies on childhood maltreatment, it is possible that the attachment figure was also the perpetrator. This could have negative effects on the security prime. In addition, it was already suggested in previous research that the success of priming interventions was influenced by the kind of attachment a person shows. “For example, for individuals with no access to a secure model, or for whom the status of being single is painful, priming with symbols of a secure relationship situation may have a negative impact“ (Oehler & Psouni, 2018, p. 14). Some people may never have had a secure attachment relationship in their life or may not have one anymore. If this is the case, the priming intervention might lead to a decrease in positive affect and increased feelings of loneliness and despair (Mallinckrodt, 2007). In the current study, seven respondents actually stated openly that they never had such a person in their life. Consequently, it was decided to exclude them from the study, since the

priming was not going to work for them. We cannot be sure that there were not other people with the same issue who did not explicitly mention it. Future research should find a way to also include those people without a secure attachment relationship and investigate how they could benefit from such an intervention.

Further considerations regarding a person's attachment style were already mentioned by Oehler and Psouni (2018). They stated that people with an anxious or avoidant attachment style had problems with „carrying out the visualization tasks retrospectively reported at the end of the two-week trial, and no expectation that the task would have an impact over time, which in turn was associated with less measured impact" (Oehler & Psouni, 2018, p. 15). Already Mikulincer et al. (2011) introduced the idea that both attachment dimensions can moderate the impact of priming interventions. Therefore, it is important to see which type of priming is most effective for which group (Oehler & Psouni, 2018). For this reason, future research should develop interventions that really take differences in attachment into account, also to minimize negative consequences for individuals.

Moreover, to increase comparability, priming instructions should be further specified and standardized. When asking people to think of a self-chosen person that provides safety and care in their life, images can be very divers. There may be other people that help them in times of need who do not classify as an attachment figure. „Some close friends might fit the definition, whereas the long-term romantic partner of some individuals may not" (Mallinckrodt, 2007, p. 171). Hence, participants should be provided with a more detailed description of the qualities an attachment figure has (operational definitions). This would assure that the person they visualize actually is an attachment figure (this was already suggested by Mallinckrodt, 2007). In this way, people that do not have a person with these qualities in their life could be excluded from the study more easily or analyzed separately. This could lead to further insight on the people that really benefit most from this sort of intervention. Clearly, individual differences affect its effectiveness, wherefore a focus should be put on primes incorporating those differences.

Lastly, security priming creates very promising opportunities in many areas of psychology (Gillath & Karantzas, 2019). However, it might not be powerful enough to bring changes in such a solid attribute like empathy. At least not if it is executed one time only, as was the case in this study. Eliciting attachment security for a longer period of time might improve outcomes. Future studies regarding the benefits of security priming should therefore focus more on the implementation of a repeated priming intervention. Repeated security priming is thought to „contribute to what Mikulincer and Shaver (2017) refer to as the

‘broadening and building cycle’ of attachment security“ (Gillath & Karantzas, 2019, p. 93). This means that through repeated activation of the representations of people being available in times of need (attachment figures), people can internalize a more secure attachment scheme (Mikulincer & Shaver, 2007). Gillath and Karantzas (2019) also concluded that the few studies investigating repeated security priming, which constitutes an intervention for at least one week, found the following positive effect: „increases in positive relationship appraisals, positive mood and emotional wellbeing, positive appraisals of the self, greater compassion toward others, and reductions in attachment-related anxiety“ (Gillath & Karantzas, 2019, p. 86). Additionally, Hudson & Fraley (2018) also found enhance attachment security in people with anxious attachment after repeated security priming over the course of four months (Hudson & Fraley, 2018). Therefore, to improve such a stable quality like empathy, a focus should be put on investigating repeated priming interventions in future research.

5.3 Advantageous Aspects and Limitations

The study population

The current study has various advantageous aspects. The sample size exceeded the recommended amount based on a formula by Tabachnick and Fidell (2013, p. 123): $N > 50 + 8m$ (m stands for the number of predictors). Besides, it included a mixed sample, with people from various countries, both female and male participants, as well as varying degrees of mental disorders and childhood trauma experiences.

There are, however, also some limitations regarding the study population that need to be addressed. Predominantly people with German nationality participated in the study. This limits the generalizability to other cultures and ethnicities, since the expression of empathy may vary depending on the specific cultural and social background a person has, as well as his or her motivation (Greenberg et al., 2018; Mikulincer et al., 2001). Second, there is an overrepresentation of women. When the sample was analyzed for male and female participants separately no significant differences were found for the full model, however. Third, the sample turned out to be less diverse than expected, mostly consisting of people with some kind of traumatic experiences in childhood. This made the formation of a group without any traumas impossible. For that reason, a low trauma group was formed to compare to the severe trauma group. Besides, the group means of empathy responses were very similar in all groups. On the one hand, these findings can have sampling reasons. Respondents were mainly recruited through social media and voluntarily participated in the online study.

Therefore, the topic of the study might have had particular importance to them personally (for example, if they experienced adverse conditions in childhood). Besides, people who are reflective and actively dealing with their past experiences or their mental problems may be more willing to also participate in a study on this topic conducted by the psychology department of a university. Thus, the sample with elevated levels of childhood trauma might be due to the fact that the people who chose to participate had more severe psychological problems or maladaptive experiences in the past. Greenberg and his colleagues (2018) mentioned that their sample also included more people with traumatic experiences than without (Greenberg et al., 2018). On the other hand, it could reflect a general tendency in the population, pointing to the possibility that most people experience some kind of trauma while growing up. In 2014, Li and colleagues acknowledged the problem that traumatic experiences in childhood are highly prevalent in western countries (rates ranging from being 34–59% for neglect, 19–28% for physical abuse, 9–10% for sexual abuse and 7–34% for emotional abuse) and lead to severe public health issues (Li et al., 2014). Li and colleagues (2014) themselves investigated a sample of 485 students and found prevalence rates of 18.76% for emotional abuse, 11.13% for physical abuse, 27.01% for sexual abuse, 49.48% for emotional neglect, and 68.66% for physical neglect (Li et al., 2014).

Questions regarding traumatic experiences

Questionnaires on traumatic childhood experiences can have negative consequences for affected people as specific questions might lead to some kind of retraumatization. By applying such questionnaires in the form of an online study, respondents are on their own without the researcher's or other psychological help being around (Schaub, 2015). Nevertheless, in a meta-analyis by Jaffe, DiLillo, Hoffman, Haikalis, & Dykstra (2015; Does it hurt to ask? A meta-analysis of participant reactions to trauma research) it was concluded that trauma-related research holds a small risk for trauma affected individuals. Furthermore, participants could drop out at any time. Besides, to minimize any possible negative effects, a trigger warning was included when recruiting participants for this study. This was done in order to ensure that people with traumatic experiences would not be caught of guard when asked questions about their experiences. In addition, it should prevent flashbacks or an increase in distress, especially among people with PTSD.

Online study and self-report measures

Online studies can have certain advantages and disadvantages. The subjectively perceived anonymity is greater for the participants in this sort of design than with paper and pencil tests or experiments in a laboratory setting. This should lead to less distorted or socially desirable answers and more truthful information from respondents (Schaub, 2015). Overall, it is believed that internet-based trauma assessment is a valid and reliable method of investigation (Fortson, Scotti, Del Ben, &Chen, 2006). Also, Boag and Carnelley (2016) argue that laboratory experiments and online surveys are comparable in their validity of results (Boag & Carnelley, 2016).

Nevertheless, when data are collected through a self-report measure, it is always possible that people do not answer truthfully, or that the answer's validity is distorted by subjective perception (Schaub, 2015). Since the study used retrospective self-report measures, it is additionally possible that memory bias leads to inaccurate recall of passed events. Therefore, results of these measures should be interpreted with caution, especially, when asking people about their experiences in childhood. It is likely that the time, which has passed since the incidents, distorts and influences the answers in some way. Experiences made later in live might also change the memory of events in childhood. Self-report measures always yield the risk of inaccuracy. Regarding empathic responding, Greenberg et al. (2018) suggested that observer questionnaires answered by family members or friends could be added. Another option would be to include performance tasks and field studies. The existing measures (investigating reactions to other people's pain or facial expression, for example with the Reading the Mind in the Eyes test) seem a bit limiting. To measure a more general form of empathy and really assess this attribute in more detail, a new task should be developed, possibly including various empathy measures in one. This would be important, since one reason for the discrepancies across studies is likely to be the disagreement regarding the definitions and operationalizations.

Clinical implications of the current research

Findings are important for the clinical context, since it is established that "various clinical disorders with childhood maltreatment as a major etiological factor have impaired empathy as a core symptom (eg, Cluster B personality disorders and complex posttraumatic stress disorder)" (Locher et al., 2014, p. 98). One clinical condition that is both linked to dysfunctions in empathy and childhood trauma experiences is the borderline personality disorder (BPD). According to Roepke et al. (2013), the found deficits in emotional and

cognitive empathy in people with BPD can be explained by a comorbid PTSD, childhood trauma, heightened arousal and affective instability (Schaub, 2015).

If attachment security priming proves to be beneficial for people who did not experience a secure attachment relationship in childhood, it could be a useful addition to therapy. In this way, people could be helped to establish more fulfilling relationships and have more positive social interactions in the future (Carnelley et al., 2018). Besides, it can have positive effects on other mental disorders, such as anxiety, depression and PTSD (Carnelley et al., 2018; Oehler & Psouni, 2018).

Other forms of treatment, like psychotherapy, are probably more effective in creating secure attachment experiences and improving empathy in the long term. Security priming, however, could be a relevant approach with a broad impact and applicability, since it has the advantage to work fast. In this way, it could be made available more broadly as an initial and quick intervention for people with traumas. For example, for children and adolescents traumatized by war and flight experiences.

It represents a technique that could also be further developed into a part of a therapeutic method to improve social functioning by strengthing people's feeling of security. This could make them act more adaptively in the interpersonal context and possibly also react more openly to therapy in general. This sort of intervention has great potential and previous research was able to show its benefits in other areas. It is therefore believed that it can also help with issues such as empathy. It might only be a matter of technique and the duration of implementation that is needed to make it successful.

5.4 Conclusion

In summary, the current study regarding effects of security priming on empathy in people with traumatic experiences in childhood, that was performed online, did not show the expected significant results. The variables did not have a major influence on each other, wherefore it stays questionable whether security priming is effective in the improvement of empathic responses towards others. In light of these result and several limitations of the study, it is not possible to draw final conclusions on this topic. Several other studies have pointed to beneficial effects of security priming. In the case of the current study, the design could be the reason for the insignificant main findings. Besides, repeated security priming is suggested to be more successful leading to more long-lasting effects. If future research finds online-based intervention to be successful, this could lead to great new opportunities to reach more people.

It will need further investigation to clarifying the dynamic between the variables included in this study. This would help to establish more clearly what kind of interventions could really increase empathy, which is a central quality in the interpersonal domain. In turn, it could improve people's interaction and relationships.

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7 List of tables

8 Appendices

Appendix A: English Abstact

Introduction: Traumatic experiences in childhood, such as abuse and neglect, can adversely affect a person's development, mental health and interpersonal relationships. In the social domain, it can influence someone's attitudes and behaviors. The current study investigated the effects of childhood trauma on empathy, by controlling for related constructs such as attachment and emotion regulation. Childhood trauma is associated with deficits in these construct. It was, therefore, suggested that a security priming intervention, which induces feelings of comfort and safety usually provided by an attachment figure, might improve people's empathic responding. This study wanted to add to existing literature, since previous research regarding this topic has presented inconsistent results.
Study: The study was performed online. 342 valid male and female respondents with clinical and non-clinical backgrounds, including people with and without childhood trauma experiences, were obtained. Their answers were analyzed with an ANCOVA.
Results: The analysis yielded non-significant findings regarding the main hypothesis that security priming will have a positive effect on empathy and this effects will be stronger for people without traumatic experiences in childhood. Empathy was not influenced by childhood trauma severity (low or severe) and priming condition (security or neutral). Only emotional neglect (a subcategory of childhood trauma) had a significant association with empathy scores in this study (as well as attachment and the emotion regulation strategy of reappraisal).
Discussion: These finding point to the conclusion that the connection between childhood trauma, security priming and empathy is probably dependent on many factors. Other variables (such as attachment) seem to more strongly influence whether skills like empathy develop after the experience of a traumatic event. Future studies should therefore investigate these dynamics and see how security priming, which leads to various benificial outcomes in many areas, could possibly have consistently positive effects on empathy.

Keywords: Empathy, Childhood Trauma, Security Priming, Attachment, Emotion Regulation

Appendix B: German Abstract

Einführung: Traumatische Erfahrungen in der Kindheit, wie Missbrauch und Vernachlässigung, können die Entwicklung, die psychische Gesundheit und die sozialen Fähigkeiten einer Person negativ beeinflussen. Die aktuelle Studie untersuchte die Auswirkungen von Kindheitstraumata auf die Empathie, während sie für verwandte Konstrukte wie Bindung und Emotionsregulation kontrollierte. Kindheitstraumata sind mit Defiziten in diesen verwandten Variablen verbunden. Es wurde daher angenommen, dass das Primen eines sicheren Bindungstypenschemas (Security Priming), die Empathie gegenüber anderen Menschen verbessern könnte. Bisherige Studien über den Zusammenhang zwischen den Variablen ergaben inkonsistente Ergebnisse.
Studie: Diese Studie wurde online durchgeführt. Insgesamt wurden die Daten von 342 männlichen und weiblichen Personen, mit oder ohne Kindheitstraumaerfahrungen, mit einer ANCOVA ausgewertet.
Ergebnisse: Die Analyse ergab nicht-signifikante Ergebnisse bezüglich der Haupthypothese, dass Security Priming einen positiven Effekt auf die Empathie hat und dass dieser Effekt für Menschen ohne traumatischen Erfahrungen in der Kindheit stärker sein wird. Die Empathie wurde nicht durch die Schwere der Kindheitstraumata (leicht oder schwer) und das ausgeführte Priming (Sicherheitsprime oder neutraler Prime) beeinflusst. Nur die Unterkategorie der emotionalen Vernachlässigung zeigte einen signifikanten Zusammenhang mit Empathie.
Diskussion: Diese vorliegenden Ergebnisse deuten darauf hin, dass der Zusammenhang zwischen Kindheitstrauma, Security Priming und Empathie wahrscheinlich von vielen Faktoren abhängt. Andere Variablen (z.B. Bindung) scheinen einen stärkeren Einfluss auf die Entwicklung von Fähigkeiten wie Empathie nach der Erfahrung eines traumatischen Erlebnisses zu haben. Zukünftige Studien sollten daher diese Dynamik untersuchen und herausfinden wie Security Priming, das zu klaren positiven Ergebnissen in anderen Bereichen führt, auch zu klaren Verbesserungen der empathischen Reaktionen anderen Menschen gegenüber beitragen kann.

Keywords: Empathie, Kindheitstrauma, Security Priming, Bindung, Emotionsregulation

Appendix C: Childhood Trauma Questionnaire

Diese Fragen befassen sich mit einigen Ihrer Erfahrungen während Ihrer Kindheit und Jugend. Auch wenn die Fragen sehr persönlich sind, versuchen Sie bitte, sie so ehrlich wie möglich zu beantworten. Geben Sie bitte rückblickend an, wie häufig Sie diese Situationen erlebt haben.

1----------2----------3----------4----------5
überhaupt nicht sehr selten einige Male häufig sehr häufig

Als ich aufwuchs...

Emotionaler Missbrauch

3. bezeichneten mich Personen aus meiner Familie als „dumm“, „faul“ oder „hässlich“.
8. glaubte ich, dass meine Eltern wünschten, ich wäre nie geboren.
14. sagten Personen aus meiner Familie verletzende oder beleidigende Dinge zu mir.
18. hatte ich das Gefühl, es hasste mich jemand in meiner Familie.
25. Ich glaube, ich bin emotional (gefühlsmäßig) missbraucht worden, als ich aufwuchs.

Körperliche Misshandlung

9. wurde ich von jemandem aus meiner Familie so stark geschlagen, dass ich zum Arzt oder ins Krankenhaus musste.
11. schlugen mich Personen aus meiner Familie so stark, dass ich blaue Flecken oder Schrammen davon trug.
12. wurde ich mit einem Gürtel, einem Stock, einem Riemen oder mit einem harten Gegenstand bestraft.
15. Ich glaube, ich bin körperlich misshandelt worden, als ich aufwuchs.
17. wurde ich so stark geschlagen oder verprügelt, dass es jemandem (z.B. Lehrer, Nachbar oder Arzt) auffiel.

Sexueller Missbrauch

20. versuchte jemand, mich sexuell zu berühren oder mich dazu zu bringen, sie oder ihn sexuell zu berühren.

21. drohte mir jemand, mir weh zu tun oder Lügen über mich zu erzählen, wenn ich keine sexuellen Handlungen mit ihm oder ihr ausführen würde.
23. versuchte jemand, mich dazu zu bringen, sexuelle Dinge zu tun oder bei sexuellen Dingen zuzusehen.
24. belästigte mich jemand sexuell.
27. Ich glaube, ich bin sexuell missbraucht worden, als ich aufwuchs.

Emotionale Vernachlässigung

5. gab es jemand in der Familie, der mir das Gefühl gab, wichtig und jemand Besonderes zu sein.
7. hatte ich das Gefühl, geliebt zu werden.
13. gaben meine Familienangehörigen aufeinander acht.
19. fühlten sich meine Familienangehörigen einander nah.
28. war meine Familie mir eine Quelle der Unterstützung.

Körperliche Vernachlässigung

1. hatte ich nicht genug zu essen.
2. wusste ich, dass sich jemand um mich sorgte und mich beschützte.
4. waren meine Eltern zu betrunken oder von anderen Drogen „high“, um für die Familie zu sorgen.
6. musste ich dreckige Kleidung tragen.
26. gab es jemanden, der mich zum Arzt brachte, wenn ich es brauchte.

Bagatellisierung/Verleugnung

10. gab es nichts, was ich an meiner Familie ändern wollte.
16. hatte ich eine perfekte Kindheit.
22. hatte ich die beste Familie der Welt.

Appendix D: Interpersonal Reactivity Index

Sie werden jetzt eine Reihe von Aussagen lesen, die jeweils bestimmte (verallgemeinerte) menschliche Eigenschaften oder Reaktionen beschreiben, die alle etwas mit Gefühlen zu tun haben. Bitte kennzeichnen Sie dann auf der 5-Punkte-Skala, inwieweit diese Aussage auf Sie zutrifft; je höher die Zahl, desto höher die Zustimmung.

1	2	3	4	5
trifft gar nicht zu		neutral		trifft sehr gut zu

1. Ich empfinde warmherzige Gefühle für Leute, denen es weniger gut geht als mir.
2. Die Gefühle einer Person in einem Roman kann ich mir sehr gut vorstellen.
3. In Notfallsituationen fühle ich mich ängstlich und unbehaglich.
4. Ich versuche, bei einem Streit zuerst beide Seiten zu verstehen, bevor ich eine Entscheidung treffe.
5. Wenn ich sehe, wie jemand ausgenutzt wird, glaube ich, ihn schützen zu müssen.
6. Ich fühle mich hilflos, wenn ich inmitten einer sehr emotionsgeladenen Situation bin.
7. Nachdem ich einen Film gesehen habe, fühle ich mich so, als ob ich eine der Personen aus diesem Film sei.
8. In einer gespannten emotionalen Situation zu sein, beängstigt mich.
9. Mich berühren Dinge sehr, auch wenn ich sie nur beobachte.
10. Ich glaube, jedes Problem hat zwei Seiten und versuche deshalb beide zu berücksichtigen.
11. Ich würde mich selbst als eine ziemlich weichherzige Person bezeichnen.
12. Wenn ich einen guten Film sehe, kann ich mich sehr leicht in die Hauptperson hineinversetzen.
13. In heiklen Situationen neige ich dazu, die Kontrolle über mich zu verlieren.
14. Wenn mir das Verhalten eines anderen komisch vorkommt, versuche ich mich für eine Weile in seine Lage zu versetzen.
15. Wenn ich eine interessante Geschichte oder ein gutes Buch lese, versuche ich mir vorzustellen, wie ich mich fühlen würde, wenn mir die Ereignisse passieren würden.
16. Bevor ich jemanden kritisiere, versuche ich mir vorzustellen, wie die Sache aus seiner Sicht aussieht.

Appendix E: Experience in Close Relationships - Revised

Die folgenden Aussagen beziehen sich darauf, wie Sie sich in emotional bedeutsamen Partnerschaften fühlen. Von Interesse ist für uns dabei vor allem, wie Sie im Allgemeinen Partnerschaften erleben, nicht so sehr, was gerade in einer aktuellen Partnerschaft passiert. Bitte nehmen Sie zu jeder Aussage Stellung, indem sie eine Zahl ankreuzen, um darzustellen, wie sehr sie der Aussage für sich zustimmen.

1----------2----------3----------4----------5----------6----------7
stimme gar nicht zu — neutral — stimme völlig zu

1. Ich habe Angst, die Liebe meines Partners/meiner Partnerin zu verlieren.
2. Ich ziehe es vor, einem Partner/einer Partnerin nicht zu zeigen, wie ich in meinem Innersten fühle.
3. Ich mache mir oft Sorgen, dass mein Partner/meine Partnerin nicht bei mir bleiben will.
4. Ich fühle mich wohl damit, meine privaten Gedanken und Gefühle mit meinem Partner/meiner Partnerin zu teilen.
5. Ich mache mir oft Sorgen, dass mein Partner/meine Partnerin mich nicht wirklich liebt.
6. Es fällt mir schwer, mich auf meinen Partner/meine Partnerin zu verlassen.
7. Ich mache mir häufig Sorgen um meine Beziehungen.
8. Ich fühle mich sehr wohl damit, meinem Partner/meiner Partnerin nahe zu sein.
9. Ich wünsche mir oft, dass die Gefühle meines Partner/meiner Partnerin mir gegenüber genauso stark sind, wie meine Gefühle für ihn/sie.
10. Ich fühle mich unwohl, mich meinem Partner/meiner Partnerin zu öffnen.
11. Ich befürchte, dass ich meinem Partner/meiner Partnerin weniger bedeute, als er/sie mir.
12. Ich ziehe es vor, meinem Partner/meiner Partnerin nicht nahe zu sein.
13. Wenn mein Partner/meine Partnerin nicht in meiner Nähe ist, befürchte ich häufig, er/sie könnte sich für jemand anderen interessieren.
14. Mir wird unwohl, wenn ein Partner/eine Partnerin mir sehr nahe sein will.
15. Wenn ich in einer Partnerschaft Gefühle zeige, habe ich Angst, dass mein Partner/meine Partnerin nicht ebenso für mich fühlt.

16. Mir fällt es relativ leicht, meinem Partner/meiner Partnerin nahe zu kommen.
17. Ich mache mir selten Sorgen darüber, dass mein Partner/meine Partnerin mich verlässt.
18. Ich fühle mich wohl dabei, mich auf meinen Partner/meine Partnerin zu verlassen.
19. Mein Partner/meine Partnerin bringt mich dazu, an mir selbst zu zweifeln.
20. Normalerweise bespreche ich Probleme und Anliegen mit meinem Partner/meiner Partnerin.
21. Ich mache mir selten Sorgen, verlassen zu werden.
22. Es hilft mir, mich in schwierigen Zeiten an meinen Partner/meine Partnerin zu wenden.
23. Ich habe den Eindruck, dass mein Partner/meine Partnerin nicht so viel Nähe möchte wie ich.
24. Ich erzähle meinem Partner/meiner Partnerin so ziemlich alles.
25. Manchmal ändern Partner/Partnerinnen ihre Gefühle für mich ohne ersichtlichen Grund.
26. Ich bespreche vieles mit meinem Partner/meiner Partnerin.
27. Mein Bedürfnis nach großer Nähe schreckt andere Menschen manchmal ab.
28. Ich bin nervös, wenn mein Partner/meine Partnerin mir zu nahe kommt.
29. Ich habe Angst, dass sobald ein Partner/eine Partnerin mich näher kennen lernt, er/sie mich nicht so mag, wie ich wirklich bin.
30. Es fällt mir nicht schwer, meinem Partner/meiner Partnerin nahe zu kommen.
31. Es macht mich wütend, dass ich von meinem Partner/meiner Partnerin nicht die Zuneigung und Unterstützung bekomme, die ich brauche.
32. Es fällt mir leicht, mich auf meinen Partner/meine Partnerin zu verlassen.
33. Ich befürchte, dass ich nicht an andere Leute heranreiche oder im Vergleich mit ihnen schlecht abschneide.
34. Es fällt mir leicht, meinem Partner/meiner Partnerin gegenüber liebevoll zu sein.
35. Mein Partner/meine Partnerin scheint mich nur dann wahrzunehmen, wenn ich wütend bin.
36. Mein Partner/meine Partnerin versteht mich und meine Bedürfnisse wirklich.

Appendix F: Emotion Regulation Questionnaire

Wir möchten Ihnen gerne einige Fragen zu Ihren Gefühlen stellen. Uns interessiert, wie Sie Ihre Gefühle unter Kontrolle halten, bzw. regulieren. Zwei Aspekte Ihrer Gefühle interessieren uns dabei besonders. Einerseits ist dies Ihr emotionales Erleben, also was Sie innen fühlen. Andererseits geht es um den emotionalen Ausdruck, also wie Sie Ihre Gefühle verbal, gestisch oder im Verhalten nach außen zeigen.

Obwohl manche der Fragen ziemlich ähnlich klingen, unterscheiden sie sich in wesentlichen Punkten.
Bitte beantworten Sie die Fragen, indem Sie folgende Antwortmöglichkeiten benutzen.

1----------2----------3----------4----------5----------6----------7
stimmt überhaupt nicht — neutral — stimmt vollkommen

1. Wenn ich mehr positive Gefühle (wie Freude oder Heiterkeit) empfinden möchte, ändere ich, woran ich denke.
2. Ich behalte meine Gefühle für mich.
3. Wenn ich weniger negative Gefühle (wie Traurigkeit oder Ärger) empfinden möchte, ändere ich, woran ich denke.
4. Wenn ich positive Gefühle empfinde, bemühe ich mich, sie nicht nach außen zu zeigen.
5. Wenn ich in eine stressige Situation gerate, ändere ich meine Gedanken über die Situation so, dass es mich beruhigt.
6. Ich halte meine Gefühle unter Kontrolle, indem ich sie nicht nach außen zeige.
7. Wenn ich mehr positive Gefühle empfinden möchte, versuche ich über die Situation anders zu denken.
8. Ich halte meine Gefühle unter Kontrolle, indem ich über meine aktuelle Situation anders nachdenke.
9. Wenn ich negative Gefühle empfinde, sorge ich dafür, sie nicht nach außen zu zeigen.
10. Wenn ich weniger negative Gefühle empfinden möchte, versuche ich über die Situation anders zu denken.

Appendix G: Classification table of trauma severity

Scale	None (or minimal)	Low (to moderate)	Moderate (to severe)	Severe (to extreme)
Emotional Abuse	5 - 8	9 - 12	13 - 15	>= 16
Physical Abuse	5 - 7	8 - 9	10 - 12	>= 13
Sexual Abuse	5	6 - 7	8 - 12	>= 13
Emotional Neglect	5 - 9	10 - 14	15 - 17	>= 18
Physical Neglect	5 - 7	8 - 9	10 - 12	>= 13

Note. Guidelines for the classification of CTQ Total Scores by subscale (Bernstein & Fink, 1998).