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Ostracism and Aggression

Influence of increasing provocation by peers on aggressive behaviour after acute experience of ostracism

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Für die (zu vielen) Verluste des vergangenen Jahres

(in chronologischer Reihenfolge)

Don Carlos- der Arme

Flachkatze- die Harfenspielerin

Franziska- die Tapfere

Meine geliebte Mutter (Du bist die Beste, Mama! N.Ö.F.F.^{mult})

Monika- ein wenig viel DIE Katze

Susanne- die ewig Geduldige

Maurice- der Nerd

Bis wir uns wieder sehen.

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Abstract

The desire for positive social relationships is one of the most fundamental and universal of human needs. Failure to satisfy this need can have devastating consequences for person concerned. Being excluded, socially rejected or ostracized threaten social connectedness and feeling of belonging and consequently are a very aversive and painful experience. Recent research has shown that this experience could lead to negative feelings and aggressive behaviour.

The present study investigated the effects of ostracism and constantly increasing levels of provocation on two different types of aggressive behavior and on emotions. Additionally, the relationship between dispositional factors concerning anger, aggression and stress and ostracism were explored concerning their influence on aggressive behaviour. Participants were either ostracized or included in computer game of ball tossing (Cyberball), and then exposed to either increasing or constantly mildly provocation in a setting of either a series of blasts of aversive noise or deduction of money (two versions of the Taylor Aggression Paradigm). Aggression was defined as the mean response to the provocation - either volume and duration of the noise set for the opponent or the amount of deducted money. Mood was assessed before and after the Cyberball as well as after the provocation-aggression paradigm. Participants were mainly student of their first year, which were peers but not friend with each other.

In line with previous studies increased anger and aggression were found after provocation. Effects of ostracism on aggression, however, were dependent on (1) the type of aggressive behaviour, (2) the level of provocation, and (3) the participants' sex. Ostracism tended to result in more aggressive behaviour, led to increase feelings of anger and to decrease in needs of belonging, self-esteem, control and meaningful existence. In combination with high physical provocation by peers, aggressive behaviour declined. Learned helplessness or the social contact to important candidates of future peer group might explain these results. Moreover, peer ostracism enhances risk taking behaviour in males causing monetary harm to the ostracizing peers, but decreases risk taking in females.

Further separate investigations of influence of provocation and important social contacts with anticipated further connections are necessary. Nevertheless, these results support recent findings, which showed on the one hand the desire of ostracized individuals to form new relationships and on the other the possibility to prevent aggressive behaviour by social contacts, imagined or experienced. The importance of positive social connections should be considered more carefully in early intervention programs.

1. Introduction

Humans are essentially social creatures. We have not only a strong desire for positive and lasting relationships, but the need to belong is among the most pervasive and fundamental motives (For a review see Baumeister & Leary, 1995). From an evolutionary point of view being a member of a group assures the survival of an individual, as only a group could guarantee that all members have food, shelter and safety. Being rejected and repulsed from one's group would have been a death sentence and the life of a social outcast would have been brutal and brief. Today in our modern world, we are quite able to fend for ourselves and do not depend on close relationships to survive. Nevertheless, we attach great importance to family, lovers, friends, colleagues and acquaintances. If we do not receive an answer on our email, wait hours and days for a recall, are stood up by our lover, are not invited to a party, do not get the job we'd apply for, or just receive the feedback that our presents is undesired, we are at least astonished or even hurt.

As these examples show, exclusion can occur in a variety of different forms and everyone has had experiences with social exclusion. Most of us have been teased, excluded or even bullied by peers from infancy to adolescence. Moreover, we experienced this treatment as very aversive and painful. Williams stated, that "few events in life are more painful than feeling that others, especially those whom we admire and care about, want nothing to do with us." (Williams, 2001, p.1). The prevalence of adults indicates that all individuals will be both a target and a source of some form of social exclusion and rejection within almost all sorts of relationships and social bonds (Williams, Forgas, von Hippel, & Zadro, 2005). Indeed, 67% of representative US sample admitted using the silent treatment on a loved one, and 75% indicated that they had been a target of the silent treatment by a loved one (Faulkner, Williams, Sherman, & Williams, 1997).

The function of exclusion is to bring individuals, who deviate from other's expectations back into fold or expel him or her altogether (Williams, 2001). By the means of anticipated or actual repulse, a control of contranormative behaviour is achieved and group norms or individual integrity are maintained. How do targets of exclusion react in response to this unpleasant and aversive treatment? As mentioned above, in the first instance we are hurt, but what about our behaviour? Do we try to re-establish the shattered relationship, do we seek to find new social connections or do we try harm in return those who hurt us by rejection?

Recent research has shown that being excluded might lead to negative feelings and aggressive behaviour. Common observation suggests that people often become angry and even aggressive, when they feel rejected or excluded by others. The Office of Surgeon

General stated in their report 2001, which reviewed research on the causes of youth violence, that social isolation was the most significant risk factor for adolescent violent behaviour. Moreover, consequences of being the target of exclusion assume alarming proportions. In a careful case study about perpetrators of school shootings Leary, Kowalski, Smith, & Phillips (2003) revealed that most of the shooters previously suffered from both acute and chronic social rejection, such as ostracism, bullying, or social harassments by peers or relationship partners. Makepeace (1989) found out that rejection accounted for 15% of the violent episodes for dating couples who were dating steadily and 11% for those who were living together. This may underestimate the role of rejection in violence of dating couples, as jealousy, clearly a feeling caused in part by rejection, accounted for further 20% of violent episodes. Leary, Twenge, & Quinlivan (2006) in their review of rejection as antecedence of aggressive behaviour depicts many other cases in which any form of rejection lead to aggression, like for example homicides, gang violence, peer rejection and parental rejection. They conclude that interpersonal rejection affects aggressive behaviour and mediators of aggression as anger and derogation of others.
Yet, despite the far reaching implications of social exclusion on both the target of exclusion and on society as a whole, only in the last decade did that social psychology begin to consider social exclusion as an area worthy of investigation. This resulted in a rise of new theories concerning the nature of social exclusion, new models on which to base experimental research, and new paradigms that provide innovative ways to explore the effects of being a target of social exclusion. Fortunately, this renaissance of this issue of investigation has entailed a multi-method approach, which has led to a broader understanding of the complexity of nature, causes and consequences of social exclusion. Several laboratory studies found a causal connection between various forms of exclusion and aggressive behaviour (e.g.: Twenge, Baumeister, Tice, & Stucke, 2001; Twenge, Baumeister, DeWall, Ciarocco, & Bartels, 2007a; Twenge, Zhang, Catanese, Dolan-Pascoe, Lyche, & Baumeister, 2007; Warburton, Williams, & Cairns, 2006). However, despite the recent increase of research of this topic, still it is still not clear which dispositional and situational factors bring the target of exclusion to harm other individuals.
The aim of the present study is to further investigate the connection between ostracism and aggressive behaviour and possible moderating dispositional factors concerning trait levels of stress, anger and aggression and a situational factor of increasing provocation. First the theoretical background and empirical studies of exclusion and aggression are presented, which lead to the aim of the present study. Chapter 3 contains materials and methods. Subsequently, the results are presented and discussed in detail.

2. Theoretical background

In the following chapter the different forms of exclusion and the various methods for their realisation in experimental studies are presented. Afterwards, by the means of the model of ostracism from Williams (1997, 2001) the direct consequences and effects on four needs and emotions as well as the empirical support of Williams' assumptions are constituted. Then, two theoretically contradictory ostracized-induced (respectively rejection- or socially-excluded-induced) behaviour short-term reactions, namely aggressive and prosocial behaviour, are presented. A review and overlook of the present research of emotional and behavioural effects of exclusion are given. Finally, the aim of the present study and the hypotheses are explained.

2.1. Exclusion and its different forms

As discussed in the introduction, exclusion in social environment functions mainly as a method to control contranormative behaviour. This sanction of undesired behaviour can be achieved in different ways. The source of exclusion can either declare the banishment of the target, possibly reinforced with physical abuse, or just ignore him or her without further explanations. Duration and reach into the different areas of life can vary, too. Last but not least the cause for this treatment can be announced or the target is left in the dark about the reasons of exclusion. Thus, exclusion contains a variety of realisations. In the following,g the three forms discussed and investigated in research of exclusion in and through society, are distinguished from one another.

Distinction between ostracism, rejection and social exclusion

Ostracism is usually defined as being ignored and excluded (Williams & Sommer, 1997; Williams, 2001), but this exclusion is mostly not explained or verbalised and occurs without explicit negative attention. This leads to its characterisation as a nonverbal behaviour, which is reflected in the synonym "silent treatment" (Williams, 2001; Williams, 2007). The ostracized individual is treated by a group or another individual as if he or she is invisible or does not exist. Not even negative attention is paid to the target. As this treatment usually is not accompanied with an announcement or an explanation of reasons, it is very ambiguous. Targets as well as sources can easily deny that ostracism happens at all. Moreover, the target lacks vital information why he or she is ignored and therefore is deprived of the possibility to correct his or her behaviour accordingly. This fact may contribute to the difficulty people have coping with ostracism.

In laboratory studies, ostracism is often operationalized by exposing the participants to a task which involves interaction, from which they are excluded and their presents is ignored. Examples fore methods are "Ball tossing" or "Cyberball" (for a description, see below). Rejection is realized by the announcement, that further interactions with the participants are not (longer) wanted by an individual or a group (Leary, Terdal, & Downs, 1995). Thus rejection most often implies an explicit derogation and targets therefore know for certain that they are indeed being outcast. According to this, the rejected individual at least knows that he or she is important enough to receive negative attention.

Social exclusion is defined as being excluded or isolated, sometimes but not necessarily with a declaration of dislike. The target is excluded from a given network but not inevitably ignored (Williams, Forgas, & von Hippel, 2005). The manipulation occurs usually after interaction and separation, as for example in the paradigm used by Twenge et al. (2007) which is explained below. Another example is the "future alone"-paradigm (Twenge et al., 2001), where social exclusion is revealed as a prospective consequence.

These various forms of repulse may suggest it is a question of either being accepted or not. However, Leary (2001, 2005) pointed out that rejection and acceptance should not be treated as dichotomous states, but "as points along a continuum of "relational evaluation" " (Leary et al., 2006, p. 112). In a relationship, the source of rejection will value the relationship with the target as not important or even undesirable, whereas acceptance refers to a relationship which is very valuable and relevant. This evaluation happens in varying degrees, which lead to grades of acceptance and rejection. Williams (2001) refers to that aspect by introducing the taxonomic dimension "quantity" in his model of ostracism. Moreover, Leary (2001; 2005) points out, that the subjective experience of acceptance and rejection are tied directly to a person's perception of the relational evaluation of the source. A person feels rejected, if he or she has the opinion that another person does not value their relationship. This is important as the research on interpersonal exclusion, which is presented in the further course, deals with the effects of exclusion on people's experience and behaviours.

These presented definitions are not very differentiated from each other and terms are used interchangeably in research referring to various methods. Nevertheless, I will try to use the specific terms for specific operations. "Exclusion" or "repulse" will be used as a superordinate concept to refer to all different forms together.

2.2. A model of ostracism

In 1997, Williams developed a model of ostracism, which was revised 2001 and 2005 (Williams, 2001; Williams & Zardo, 2005). It assumes that ostracism threatens four fundamental needs: the need to belong, self-esteem, need for control, and meaningful existence. The model outlines the impact of ostracism on individual's mind and behaviour over time. Williams & Zardo (2005) argue that reactions to ostracism follow three stages. The first two stages are reminiscent of the primary and secondary appraisal of the transactional model of stress and coping (Lazarus 1974).

Stage 1 describes the immediate reaction to ostracism. After an adaptive early indiscriminate detection system warns the individual of potential threat of being ignored and excluded, the ostracized individual responses to any form of ostracism with hurt feelings, pain and aversive impact. This is supposed to be unmitigated by situational or individual difference factors.

In Stage 2, individuals respond and cope with ostracism according to individual differences and moderating situational factors. This reflective stage is responsive to cognitive appraisals of the situation, the sources of ostracism and the reasons for ostracism. This response is characterized by the attempt to satisfy the most threatened needs. If relational needs, the need to belonging and self-esteem, are most shattered, ostracized individuals will seek to satisfy these needs by thinking, feeling, and behaving in a relatively prosocial way. If, however, need to control and meaningful existence are most threatened, ostracized individuals lack feelings of efficacy and significance of their existence. Thus fortifying these needs may result in controlling, provocative, and even antisocial or aggressive responses.

Stage 3 describes the long-term effects of ostracism. Individuals who encounter multiple episodes or single long-term episodes of ostracism may loose their ability to cope with their threatened needs. Feelings of helplessness, alienation, and despair will dominate their thoughts, feelings, and actions.

Short term effects and consequences of ostracism, rejection, and social exclusion which are presented and discussed in detail below, are usually studied in laboratory experiments, whereas its long term effects are so far described in case studies. In field studies as well as in interviews or diaries, it is possible to examine the consequences of being ignored over longer periods, whereas laboratory research deals with the effects of ostracism over several minutes (Williams, 2001; 2007). In the following, the various methods used in laboratory studies are described. Long-term effects and their measurement will not be discussed further, as the present diploma thesis deals with the emotional and behavioural

short-term effects of ostracism. Afterwards the four needs and the effect of ostracism on those motives are discussed in detail.

2.3. Paradigms and manipulations of ostracism, social exclusion, and rejection

Several different paradigms have been used frequently in research to operationalize ostracism and its related phenomena. In the following section, the most often used methods are described in detail and their differences are discussed briefly.

Ball tossing

Williams (1997) developed an operationalisation for ostracism which is based on a personal experience with frisbee players in a park. Williams found himself accidentally in a frisbee play with two strangers. Suddenly they just stopped tossing the disc at him and he felt bad about it. He got the idea to carry this situation into the laboratory.
Participants (two confederates and one actual participant) begin tossing a ball around while they are waiting for the experimenter to return. Half the participants are included and get the ball one third of the tosses, while half receives the ball only a few times, then never again for the play duration (about 5 minutes).
Although it successfully induced ostracism and its consequences (Williams & Sommer, 1997; Warburton et al., 2006; Williams, 2001); this modality was tedious and costly. This leads to the design of Cyberball.

Cyberball

Cyberball is a virtual analogue of the ball tossing, which was designed by Williams & Jarvis (2006). Primarily designed to displace the extensive and cumbersome face-to-face ball tossing game, it was first used in online experiments. In its final version, it is installed locally on the laboratory computers. Participants are told the game is used to exercise their mental visualisation skills, as the study involves effects of mental visualisation on a subsequent task. Participants are informed via computer that they are playing with two or three other players who are connected over Internet or Intranet. Moreover, they are told that it does not matter who throws and catches the ball, but that they should visualise the setting, the other players, etc. Ostracized participants receive the ball only one or two times, whereas included participants receive the ball one third of the tosses. It is not necessary that the players meet each other before the start.
An advantage of this method is the fact, that one easily can investigate the effect of the degree an individual is ostracised. The degree of ostracism can be manipulated by the

relative amount of balls the target receives. Further information about the game and its process can be gathered from the section "materials and methods".

Life alone

Twenge et al. (2001) and Baumeister, Twenge, & Nuss (2002) developed a more future orientated manipulation to induce rejection. Participants have to fill out a personality questionnaire and receive an accurate feedback about introversion/ extraversion, followed by the estimation about their future to which they are randomly assigned. In the accepted/ future belonging condition, they are informed that they are the type who has a rich and strong network of interpersonal relationships. They will have a good matrimony and will always have good friends and a large acquaintanceship. The experimental group (rejected/ future alone condition) is told that they are the type who would end up alone in life, irrespectively how many friends they have at the moment. To control the confounding factor negative forecast, the third group is told that their personality profile predicts a life full of accidents, injuries and harmful and unpleasant events, but not being alone. This procedure was first presented in Twenge et al. (2001) and used several times thereafter (Baumeister et al., 2002; Baumeister, DeWall, Ciarocco, & Twenge, 2005; DeWall, Maner, & Rouby, 2009a; Twenge, Catanese, & Baumeister, 2002 (Exp.3, Exp.5, Exp.6); Twenge et al., 2007; Twenge et al., 2007a).

Accepted/ rejected by a group

Twenge et al. (2001, 2007 (Experiment 2)) used another further method to induce rejection, which was adapted from Leary et al. (1995). Participants meet each other in single- sex groups of 4-6 people. They talked with each other about a set of questions as a guide to get to know each other. Afterwards, they were lead in separated rooms and asked to name the two people which they met before with whom they would most like to work. Participants were randomly assigned to either accepted or rejected by the group. The accepted participants were told that everybody chose them to work with. The rejected participants were informed that nobody would like to work with them. This procedure was also used by Nezlek, Kowalski, Leary, Blevins, & Holgate (1997), Twenge et al. (2001) and Twenge et al. (2007).

A variation on this was used by DeWall et al. (2009a). Two participants exchange information about themselves, ostensibly in preparation for an interactive task. Participants are then told that the interactive task has to be cancelled, either because the partner suddenly remembered another appointment and had to leave (control condition), or

because the partner reacted negatively to the participant's disclosures and chose not to interact further (rejection condition).

Further paradigms

Several other paradigms have been used less frequently. Williams et al set up a role-playing paradigm, where they simulated a train-ride in their laboratory (Williams, 2001, p.142-161). This paradigm has the advantage that the source of ostracism can be examined, too. Moreover, Williams et al used the Cyberball paradigm either with a ball or with a disc in the internet and investigated the effects of ostracism in chat-rooms (Gardner, Pickett, & Brewer, 2000; Williams, Govan, Croker, Tynan, Cruickshank, & Lam, 2002). Additionally, ostracism, rejection, and /or social exclusion have been manipulated within the context of for example face-to-face conversations (Geller, Goodstein, Silver, & Sternberg W.C., 1974), cell phone text messaging (Smith & Williams, 2004), reliving or imagining rejection experiences (Pickett, Gardner, & Knowles, 2004; Williams & Fitness, 2004) and perceiving disinterest and indifference in what the rejected participant had to say (Snapp & Leary, 2001).

Although each of these methods realizes an exclusion of the participants, they differ in some aspects from one another. Whereas the "Cyberball" and the "Living Alone" paradigms work without a group or a source which exclude the target participant in a face to face conversation, the other paradigms put the actual rejection by a group on stage. Therefore, especially during the "Cyberball" game, the target has not the slightest idea why she or he is excluded. Opposite to this, the realisation of the "Accepted/ Rejected" paradigm might lead to rumination if the first impression or something during the conversation caused the exclusion.
Moreover, the prospect and the reach of the exclusion differ. Whereas the "Cyberball" and the "Accepted/ Rejected" paradigms realise the manipulation in the time frame of the experimental situation itself and with other participants who have no close relationship to the target person, the "Living Alone" method works with a future prospect. As the excluded participant is told that he or she will end up alone in life, the actual exclusion does not happen in the present situation of the experiment. The participant has therefore to cope with a future scene, which seems inescapable but not acute. On the other hand, this proclaimed outlook might be doubted as it is based on mere questionnaire. Furthermore, the Cyberball constitutes a method, in which participants are ignored over a timeframe of a few minutes. Participants are exposed to several small rejections, as each toss could

potentially again include the excluded player. Other paradigms in contrast work with a single announcement (Baumeister, Brewer, Tice, & Leary, 2007a).
Because of these reasons, these paradigms themselves might account for the different and sometimes contradictory outcomes of research, as each of them might refer to a specific aspect in the field of exclusion.

2.4. Ostracism and needs

Based on previous studies concerning motivation and needs, Williams postulates in his model of ostracism four needs which are shattered by ostracism: „ The core theory of the model is that ostracism, in comparison to other aversive interpersonal behaviours, has the unique potential to threaten up to four fundamental needs. These needs are the need to *belong*, the need for *self- esteem*, the need for *control*, and the need for *meaningful existence*." (Williams, 2001, p. 59-60).
These four needs or motives are well-known and enjoy considerable support for their importance in motivating human behaviour. The novel aspect carried out by the model concerning these motives is the assumption that each of them is unique and important and that they should not be subsumed into others (Williams & Zardo, 2005). However, the following definitions and explanations point out that these needs probably have fuzzy boundaries and are not strictly separable from each other.

Control

The need to perceive control over one's environment is regarded as important and essential in social and clinical psychology. In the context of depression Seligman (1975, 1998) offers in his theory of the learned helplessness an explanation for the cause for the development of clinical depression (Peterson, Maier, & Seligman, 1993). Another example is the attribution theory for success and failure by B. Weiner (1994). The dimension of control plays a crucial role in predicting how people will explain and evaluate an event and their subsequent reaction.
Ostracism is assumed to threat the need to control (Williams, 2001; Williams et al., 2005). Being a target of the silent treatment, one has no control of the interaction with the source of ostracism. As there is no communication but being ignored, the target is unable to influence the situation. A discussion, a verbal argument or even a fight have in common that these conflicts have a give-and-take structure. Unlike most other forms of aversive behaviour, ostracism depicts a unilateral nature. No reaction, provocation or verbal attack will lead to a change as the target person is treated as invisible by the source of ostracism.

Furthermore, ostracism deprives the target of the feeling of control over the situation by low causal clarity. If the ostracized person does not know or guess the reason why she or he is ignored, the target lacks the so called "interpretive control" (Rothbaum, Weiz, & Snyder, 1982). To solve the problem, which has caused the treatment becomes even more impossible and further coping processes are inhibited.
Compared to the need to belong and the need for self-esteem, little research is done on the topic of Ostracism and control, which could be due to the fact that relatively few social exclusion researchers have acknowledged the influence of exclusion on this need (Williams et al., 2005).

Meaningful existence

The terror management theory states that a prime human motive is to buffer the terror and fear they feel when they are confronted with their mortality and insignificance (Greenberg, Pyszczynski, & Solomon, 1986). The buffering consists of responses that will secure cultural and social worth and meaning. This need for meaningful existence can be shuttered by ostracism, since being completely ignored gives a glimpse of how it would be if the target of ostracism would not exist. Moreover, other authors refer metaphorically to the similarity of ostracism and death. James (1890) for example describes the feeling of being ostracized as "every person we met cut us dead" (p.293). For all these reasons ostracism or being cut dead, can serve as a cue for mortality salience.

Belonging

Baumeister &Leary (1995) reviewed in detail the importance of the need to belong and conclude that it is a fundamental human motivation (p.520) and, moreover, is evolutionary adaptive (Baumeister & Tice, 1990; Buss, 1990). People socialise easily and make friends or form attachments. Furthermore, they resist braking up social bonds, even under difficult conditions. Thus, people are motivated to acquire and sustain at least a certain level of social connectedness. Not only does this need shape behaviour, it also leads to positive emotions if it is satisfied, which supports a greater subjective mental health (McAdams & Bryant, 1987).
Lack or deficits in belongingness lead to a variety of negative and harmful consequences. People who suffer from deficits of social bonding experience negative emotions such as anxiety, more stress, and more depression (Cohen & Wills, 1985; Leary, 1990; Williams, Cheung, & Choi, 2000). Moreover, loneliness is associated with a decrease in immunocompetence and threats to the cardio-vascular system (Kiecolt-Glaser, Garner, Speicher, Penn, Holliday, & Glaser, 1984; Kiecolt-Glaser, McGuire, Robles, & Glaser, 2002).

Additionally mental illnesses as eating-disorder (Armstrong, Roth 1989) and posttraumatic stress disorder (Solomon, Waysmann, & Mikulincer, 1990) are linked to a lack of social support and belongingness. Isolated or lonely people seem to commit crimes or suicide more easily (Baumeister, 1990; Sampson & Laub, 1993) and suffer from a general decrease in well-being.

It is obvious that any sort of exclusion deprives targets of their sense of belonging. Being ignored rejected or ostracised cuts or at least threatens the attachment of the target to the group or the individual who is the source of exclusion. Compared to any other aversive interaction, exclusion proclaims explicitly or symbolically that the target is not/no longer wanted, whereas a dispute or argument still constitutes a connectedness.

Most researchers and theorists in the area of ostracism and its related paradigms acknowledge that these forms of social exclusion threaten this fundamental need to belong (Baumeister et al., 2007a; Twenge et al., 2001; Twenge et al., 2007a; Williams, 2001; Williams & Zardo, 2005). Williams argues that ostracism not only threatens this need more clearly, directly and strongly than other aversive interactions, he and his colleagues also state that belongingness is probably more important than other needs, as a threatening of it "evokes a strong immediate warning"(Williams & Zardo, 2005 p. 22).

Self-esteem

Many theorists argue that the need for maintaining high self-esteem is fundamental, pervasive, and adaptive (Baumeister, 1994; Greenberg, Solomon, Pyszczynski, Rosenblatt, Burling, Lyon et al., 1992; Steele, 1988). Maslow did not only consider social bonds like love and belongingness as higher needs, he also added the need for self-esteem to his hierarchy of needs (Maslow, 1943). How we perceive others evaluation of our own worth is associated with self-efficacy, mental health (e.g.: Bandura, 1997), and a wide area of social psychology phenomena for example self-serving attributions, attitude changes, and in-group/out-group perception (Blaine & Crocker, 1993; Crocker, Thompson, McGraw, & Ingerman, 1987).

Ostracism is hypothesized to threaten target's self-esteem primarily because it is associated with punishment. The target person gets the impression that he or she did something wrong or even worse something is wrong about her. Moreover, the target experiences that he or she is not worth of an argument or discussion or at least some negative attention but is just ignored. The rumination about if and why one is ostracized and the generation of possible failures, wrong-doings or defects threaten the self-esteem beyond the fact that one is excluded (Williams & Zardo, 2005). However, Leary et al. (1995) constitutes in his sociometer theory that self-esteem serves as a gauge for belonging and attachment. In

contrast to this, Williams & Zardo (2005) are of the opinion that this need of a high self-esteem is more than a mere function of estimating the present inclusionary status and a proxy of belonging.

These needs are not considered equally important by all researchers of social exclusion (Leary, 2005, p40). Therefore the amount of research on the need to control and the need of meaningful existence is less than that on the other two.

Questionnaires to measure the level of control, belonging, self-esteem and meaningful existence

Williams et al. (2002) introduced a standard post-experimental questionnaire which is specific to ostracism which is induced by Cyberball.
The questionnaire consists of 12 items assessing the effect of the Cyberball game on the four needs: Belonging (e.g.: "I felt like an outsider"), Self-Esteem (e.g.: "I felt good about myself"), Control (e.g.: "I felt like I had control over the course of the interaction"), and Meaningful Existence (e.g.: "I felt nonexistent"). Moreover, this questionnaire contains questions according to how they felt "while playing the game" to answer on a 5-point scale. There are three manipulation checks to adjust participants' perception of their inclusionary status with the actual ostracism (i.e.: "I was ignored," and "I was excluded," both answered on the same 5-point scale described above, and an open question: "Assuming that 33% of the time you would receive the ball if everyone received it equally, what percent of the throws did you receive?".
Twenge, Catanese, & Baumeister (2003) collected data for the needs meaningful existence and control on a 9-point Likert scale (1= not at all true; 9= very much true). Participants rated their agreement with one respectively two or three questions for each need as "How true is the statement: 'Life is meaningless'?" and "How true is the statement 'I am in control of my life'?" (Twenge et al., 2003, p.414; Twenge et al., 2007a, p.62). For self-esteem, he used the State Self-Esteem Scale (SSES; Heatherton & Polivy, 1991) (Twenge et al., 2003 (Experiment3); Twenge et al., 2007a).

2.5. Ostracism and mood

Emotions are often attached to motivations and shape therefore indirectly our behaviours (Baumeister, Vohs, DeWall, & Zhang, 2007). Thus, it seems plausible that the threat of four fundamental needs will have a high impact on the emotional system of an excluded, rejected or ostracized person. Hence, Williams (2001) predicts in his model of ostracism that the dominant reaction to being ostracized would be an immediate wave of emotional

distress. In the following, measurements of mood and studies examining consequences and emotional short-term responses of ostracism and its related paradigms are presented.

Questionnaires to measure mood

Usually the Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988) is used to measure influences on mood (Baumeister et al., 2002; DeWall et al., 2009a; Twenge et al., 2001;Twenge et al., 2003; Twenge et al., 2007).
Twenge et al. (2003) used, besides the PANAS, a questionnaire to rate the current mood on 41 adjectives using 7-point Likert scales. These included 8 adjectives describing positive affect (e.g.: happy, calm) and 33 describing negative affect (e.g.: angry, nervous, fearful, ashamed). Similar scales were used for example by Buckley, Winkel, & Leary (2004), Leary et al. (1995), and Snapp & Leary (2001).
Moreover, beside a one item scale (Twenge et al., 2001), the Brief Mood Introspection Scale (BMIS) was used to measure mood, too (e.g.: Kirkpatrick, Waugh, Valencia, & Webster, 2002; Tice, Bratslavsky, & Baumeister, 2001; Twenge et al., 2002).

2.6. Experimental studies: consequences of ostracism on needs and mood

2.6.1. Experimental studies: needs

Several studies have measured self-esteem after exclusion (temporally or imagined) and found it to be reduced (e.g.: Leary et al., 1995; Sommer, Williams, Ciarocco, & Baumeister, 2001). Similarly, beside self-esteem, the sense of belonging, control, and meaningful existence are reduced by ostracism, too (Abraham, 2003; Twenge et al., 2003; Williams et al., 2000; Zadro & Williams, 2006).
Williams and his colleagues found lower levels of these four needs, irrespectively of the paradigm used, Cyber-ostracism, train-role paradigm and Cyberball (Williams, 2001). In another study, experimenters varied the political attitude. Participants were convinced that they would play Cyberball either with a group holding similar political attitudes, or rival political attitudes or with a group representing a political tendency which is socially despised (Australian Ku Klux Klan). Despite strong reasons to discount ostracism by an out-group or, especially, a despised out-group, the distress of ostracized participants was not moderated by the psychological closeness of the ostracizing group (Gonsalkorale & Williams, 2006). Moreover, if being ostracized implicated an advantage, excluded participants were still distressed. Although being included led to a deduction of 50 cents, or even more the ball during the Cyberball was a bomb, potentially killing the catching player,

excluded participants still reported lower levels in meaningful existence, belonging, control, and self-esteem. Whether inclusion came with a cost (50 cents deducted for each throw received) or not, or whether the object being thrown was a ball or bomb (expected to explode, "killing off the player with the ball"), participants were still distressed by being ostracized (van Beest & Williams, 2006b; van Beest & Williams, 2006a).
Zadro, Williams, & Richardson R. (2004) revealed in two experiments that the needs were threatened even so participants were told that those who rejected them were ordered to do so or that they were playing against a computer.
In sum, this Ostracism-induced distress seems resilient to moderation by situational factors and individual differences (Williams & Zardo, 2005; Williams, 2007).
However, some studies failed to reveal a decrease in level of these for needs. Twenge et al. (2003) found a significant effect for meaningful existence, but not for control (Experiment 2; "accepted/rejected by a group paradigm"). Similarly, they found less feelings of belonging after the „living alone" paradigm, but the need of control was not influenced by this treatment (Twenge et al., 2007a; Experiment 6).

2.6.2. Experimental studies: mood

Many studies have examined the effects of ostracism and its related forms on self-reported distress levels. Most of the studies reviewed above, besides finding a decrease in level of the four needs an increase in self-reported distress, too. These measurements usually included negative mood, anxiety, and anger.
Williams et al. (2000) found a distress pattern that was linearly associated with the amount of ostracism to which the participants were exposed. The typical effect size of ostracism on self-reported distress, including measurement of level of needs and mood, was high, between d=1.0 and 2.0. Additionally to negative mood, anger as a subsequent emotional reaction was often collected as well. For example, Buckley et al. (2004) showed that rejected participants reported significantly more feelings of anger than those, who received a neutral or accepting feedback.
Williams and colleagues revealed using the "Cyberball" paradigm that ostracized participants experienced greater anger during the treatment than included ones (Williams et al., 2000). Moreover, this effect was even greater, when participants were told that they were playing against a computer and not against another participant (Zadro et al., 2004).
In contrast to the evidence reviewed above, some studies didn't find emotional distress following exclusion. Baumeister, Twenge and colleagues found no effects of social exclusion on mood, regardless of the type of measure employed (Twenge et al., 2003; Twenge et al., 2007). Based on their results, these researchers propose that one

consequence of social exclusion may be a state of numbness, including cognitive destruction and a shut down of the emotional system, which keeps the excluded person from further emotional injuries. The absence of emotion may reflect a natural coping mechanism (e.g.: Baumeister et al., 2007a; Twenge et al., 2003; Twenge et al., 2007; Williams, 2007). Thus, in contrast to the originally proposed consequence of emotional distress, the opposite, an emotional numbness and insensibility seems to be more probable.

Unfortunately, anger, thus measurable with the PANAS, is not mentioned in those studies, which did not find an impact of exclusion on negative mood. Only Twenge et al. (2003) mentioned that they found no significant differences in anger beyond the missing increase in negative mood in general.

2.7. Short-term reaction: coping with ostracism, rejection or social exclusion

Based on the theory and common observations about ostracism, rejection, and social exclusion, different behavioural coping reactions of the target - immediate and short-term- become plausible. Basically, two opposed responses are possible and plausible. The target could on the one side try to strengthen his or her social bonds with any form of socially desired behaviour or, on the other side, could react aggressively in the view of his threatened fundamental needs. These coping responses are presented below, together with their respective laboratory measurement and empirical research.

2.7.1. Ostracism and aggression

Aggression is commonly defined by social psychologists as behaviour intended to harm the individuals who are targets of aggression (Baron & Richardson, 1994; Lieberman, Solomon, & McGregor, 1999). This definition includes physical as well as verbal actions.

There is much evidence for an influence of (social) exclusion on aggressive behaviour. Common observations lead to the assumption that people become angry or even aggressive, if they feel rejected. Jilted lovers, rebuffed admirers may react to their repulse with anger or even aggressive behaviour, as well as children who are ostracized by their parents, not hired job candidates or just someone who learns that he or she was not invited to a party as expected. Moreover, single men are more likely to commit crimes compared to married men of the same age (Sampson & Laub, 1990). Social exclusion may even assume alarming proportions as Leary and colleagues (2003) found out in their case studies about school shootings. Almost all of the perpetrators of school shootings during the late 1990s experienced social rejection.

Moreover, people may often have the urge to aggress but consciously control this impulse. Angry mood is a signal which prepares the body for a harmful action. As a considerable high amount of research found effects of ostracism, rejection, and social exclusion on anger, the influence of exclusion on aggression seems probable.
Recently, a causal link between exclusion and aggression has been examined with the help of several laboratory studies. The frequently used measurements are presented in the following.

Laboratory measurements of aggression in the context of ostracism and rejection

Hot Sauce Paradigm

Liebermann et al. (1999) developed a new laboratory measurement of aggression called the hot sauce paradigm. This paradigm requires a manipulation of a variable that is hypothesized to influence aggression as in the present case a manipulation of exclusion by an Ostracism or Rejection paradigm (see above).
The method provides participants with an opportunity to aggress against a target by setting the amount of extremely spicy hot sauce to be allocated to the target which is a stranger and had not provoked or excluded the participant. In a common cover story participants are informed that in a second study, which examines the relation of personality and taste preference, they will taste and give their impressions of food samples (Lieberman et al., 1999). This study seems to be independent of the first one, which includes the manipulation of the variable influencing aggression. First, participants complete a "Taste Preference Inventory" that consisted of several 21-point rating scales to evaluate their preference for sweet, crisp, creamy, salty, spicy, and dry (tart) flavours. Afterwards participants are instructed to place a quantity of hot sauce into a Styrofoam cup and to seal it with the lid. It is made clear to the participants that the person who receives the hot sauce will have to consume the entire quantity of it. Participants are told that all quantities of hot sauce were useful and to "put in as much or as little" hot sauce as they wanted. Often, participants are informed that the target person has a profound dislike of spicy food, by presenting a "Taste Preference Inventory", which constitutes that the target does not like spicy food at all. To be sure the participants are aware of the intensity of the hot sauce they are instructed to taste a sample of it. The amount of spicy hot sauce chosen by the participant is weighed and presents the amount of aggression.
Additional to validity measurements of Lieberman et al. (1999), further convergent validity for this new measure has been obtained by moderate correlations between hot sauce

allocations and the Buss & Perry (1992) "Aggression Questionnaire". This method was used several times successfully in the context of exclusion and aggression (e.g.: (Warburton et al., 2006); (Kirkpatrick et al., 2002)).

Taylor Aggression Paradigm

A popular technique to measure physical aggression is to record the intensity and duration of electric shocks administered by participants to a target (Berkowitz, 1964; Hammock & Richardson, 1992a, Hammock & Richardson, 1992b, Taylor, 1967). Participants are usually informed that the experiment is investigating the effects of punishment on learning. Although this measurement actually detects the intent and performance to harm another individual, it is methodically costly and most student participants may be influenced by their knowledge of the famous Milgram's obedience studies.

The Taylor Aggression paradigm (TAP), developed by Taylor (1967), is an adaptation and improvement of this technique as the procedure is changed to a retaliation paradigm. Participants are informed that they are engaging in a reaction-time task with a team-mate. The slower person on each trial will receive a punishment, the intensity and duration of which are set for the opponent before each trail. In fact, wins and losses are predetermined and the participant receives a series of shocks during the course of the experiment. The punishment can be a shock or a noxious noise (e.g.: Bushmann, 1995; Twenge et al., 2007).

The task consists of three blocks of ten trails each. In the first block, participants receive only mild punishment. Provocation is achieved by a stepwise increase of the punishment from block one to three: In block two, participants receive an intermediate punishment and a high punishment in the last block. After each of the thirty trials, the participants received feedback about whether they won or lost, as well as about the opponent's settings. The setting of each participant is used as a measurement for aggressive behaviour.

In the present study two versions of the TAP are used, one with noise as a punishment and the other with loss of money as punishment. Both versions are described in detail in section "Materials and Methods".

This method combines the provocation, which should elicit aggression and the measurement of the aggressive response. The first ten trails offer the possibility to examine the reactive aggression behaviour without prior provocation. By analyzing just the very first trial of the task, proactive aggressive behaviour can be measured which reveals the pure effects of being excluded on behaviour. However, the TAP does not imply the possibility to separate between aggressor and target of aggression. A problem of this method is that participants may view their reaction not as aggressive but competitive as

the cover story consists of a competition task. Moreover, as the original punishment method, some versions still raise some ethical concerns as participants are exposed to uncomfortable shocks or noises.
This paradigm which has shown good construct, external, discriminant, and convergent validity (Anderson, Lindsay, & Bushman, 1999; Bernstein, Richardson, & Hammock, 1987; Giancola & Zeichner, 1995; Giancola & Chermack, 1998), is used often in the context of Ostracism, rejection and social exclusion (e.g.: Bushmann, 1995, Twenge et al., 2001, Twenge et al., 2003,Twenge et al., 2007, Warburton et al., 2006).

Job candidate evaluation

Twenge et al. use frequently in combination with the "Living alone" paradigm a measurement of aggression in which participants evaluate the person who provoked them before (e.g.: Twenge et al., 2001). Participants write an essay expressing their opinion on the abortion issue. They are asked to choose one side on the issue. Afterwards they evaluate an essay of another participant, actually a confederate, which states the opposite opinion of their own. After being either rejected or included, participants receive a positive or negative feedback of their essay from the other participant. The negative feedback condition is designed to elicit aggression. Now, participants are informed that the other participants who had evaluated their essay had applied to be a research assistant in the department. Participants are asked to evaluate the candidate on a 10-point rating scale, the scores representing the expression of aggression.
This method permits the possibility to differentiate between the aggressor, the one who provoked by giving the negative feedback of the participants' essay, and the person who is evaluated for the assistant job. One may investigate, if excluded participants show aggressive behaviour towards an innocent neutral person, too.

2.7.2. Experimental studies: ostracism and aggression

A considerable amount of research has examined the effects of ostracism, rejection and social exclusion on the aggressive behaviour or on the intent to act aggressively (see Leary et al., 2006 for a review).
In a series of experiments, Twenge and colleagues (2001) studied and ascertained the causal connection between social rejection and aggressive behaviour. Following the "accepted/ rejected by a group" manipulations and writing an essay about abortion, participants were told that they would play a reaction time game, actually the Taylor Aggression Paradigm task (TAP), with a new person. Though this person neither accepted nor rejected the participant, he or she evaluated the participant's essay negatively. During

the reaction time game, participants set length and intensity of an unpleasant noise on conditions that the opponent lost. Thus, participants were allowed to act aggressively towards an innocent person, who insulted but not rejected them. Compared to accepted participants, rejected participants were significantly more aggressive toward the opponent (Experiment 5). Interestingly, this effect occurred also if the new person was neutral, who had not insulted them and had had no previous interaction (Experiment 4). Three further experiments of this series supported the causal connection between rejection and aggressive behaviour. Participants, who were told that they would end up alone later in life gave negative ratings to someone who was applying for a job and insulted them before with a negative evaluation of their essay.

Warburton, Williams, and Cairns (2006) likewise showed a link between ostracism and aggression. Participants experienced ostracism or inclusion in a ball tossing game with two actual confederates during the experimenter's absence. Then, participants had the opportunity to harm an innocent target. Thus they were allowed to assign the amount of hot sauce to a stranger knowing that although the target strongly disliked hot and spicy foods, he or she would have to consume the entire sample. The results showed that ostracized participants assigned the target significant more hot sauce than included ones. Similarly, Twenge et al. (2007) revealed that participants, who were rejected by a group, react significantly more aggressive during the TAP towards a neutral person compared to included participants.

Buckley et al. (2004) investigated amongst other things the effects various levels of rejection and acceptance on aggressive behaviour, varying the condition that rejected participants believed that they would meet the source of rejection later in course of the experiment or not. Aggressive behaviour was measured in choosing aversive vs. pleasant tapes to hear for the source of rejection. Participants who received extreme rejection had the other person listen to the least pleasant tapes of all groups. The tapes chosen by extremely rejected participants were neutral rather than blatantly aversive, but this was in contrast to accepted participants, who selected pleasant tapes. This effect was not influenced by an anticipated interaction with the source of rejection.

Several studies have revealed that excluded participants criticize and devalue those, who rejected them. For example, Williams et al. (2002) found out, that participants, who were excluded during a chat room conversation, rated the other individuals less friendly, caring and sincere and more dishonest, selfish and insensitive. In another experiment excluded participants also reported to like the other less (Williams et al., 2002, Experiment 2 and 3). Bourgeois & Leary (2001) and Buckley et al. (2004) found similar results. Participants, who

were excluded, rated those who excluded them less positive and reported that they want to get to know them less. Moreover, Williams et al could show that excluded participants preferred to work alone or with a new group (Williams, 2001).
In summary, rejected, ostracized or excluded participants appear to be ready to behave in hostile, aggressive ways toward a broad assortment of others.

However, it seems paradoxical that a person, who experience exclusion reacts aggressively. A considerably high amount of research of aggression and aggressive behaviour has revealed that aggression lead to a decrease in social acceptance and probably to rejection itself. (e.g.: Necomb, Bukowski, & Pattee, 1993; Schuster, 2001) As mentioned in the introduction, exclusion often functions as a punishment of unaccepted behaviour in social and cultural groups. Thus, rejected or ostracized individuals, who react with aggression to this treatment, will be confronted with further social exclusion in return. The target ends up in a vicious circle.
A logical and adaptive reaction to exclusion would be make efforts to increase one's acceptability to others by behaving in socially desirable ways. As discussed above, people have a fundamental need to belong and are therefore strongly motivated to socialize and maintain relationships. Any behaviour, which promotes acceptance like to please someone, to do a favour for someone, to conform or any other behaviour which fosters the own relational value, may be the most common initial response to perceived rejection. In fact, some studies have shown that rejected or excluded people make efforts to improve their acceptance.

2.7.3. Ostracism and prosocial behaviour

Williams & Sommer (1997) examined the effects of ostracism on individuals' subsequent contributions to a group task. They found out that female participants, who were ostracized by a group worked harder in a group task. Interestingly, this effect occurred only, if their individual contributions were not identified. Ostracized male participants tended to socially loaf. Moreover, ostracized participants conformed to others' incorrect judgement than included participants (Williams et al., 2000).
In contrast to these results, which support the idea that ostracism leads to behaviour which promotes acceptance, Twenge et al. (2007a) found a decrease of prosocial behaviour after social exclusion. In a series of seven experiments, participants were rejected using either the "living alone" or the "accepted/rejected by a group" paradigm and then confronted with a situation which demanded prosocial behaviour. The results revealed that rejected participants donated four times less money to a student emergency fund than

nonexcluded participants (Experiment 1 and 7), volunteered for fewer extra experiments (Experiment 2), were less willing to help the experimenter after a mishap (Experiment 3) and cooperated less in a mixed-motive game (prisoner's dilemma, experiment 4, 5, and 6). Taken together these finding of interpersonal behaviour suggest that excluded, ignored or rejected people will rather behave aggressively. Although a prosocial manner seems to be much more adaptive, it is seldom found in laboratory studies.

2.7.4. Experimental studies: how to inhibit aggression after exclusion

Previous research has shown that any form of social exclusion can lead to aggressive behaviour. How can this socially undesirable consequence be prevented? It may be important for two reasons to find possibilities to prevent this exclusion-induced behaviour. First, as Leary et al. (2003) reviewed, social exclusion can lead to traumatic events as school shootings. Moreover, factors, which inhibit aggressive reaction as a response to exclusion, may give information about the mediating factors which lead to this maladaptive response.

Twenge et al (2007, experiment 5) found out that if the opponent acts in a prosocial and cooperative manner towards the excluded participant, the latter did not respond aggressively. In this experiment, during the Taylor Aggression Paradigm, the computer did not provoke the participant with unpleasant white noises of long duration and high volume till the fifth trail. Thus, the first 5 turns of the 10-turn game were played amid a spirit of cooperation and reciprocation. The excluded participants respond to this without aggression. Not until they were provoked the first time, they were much less cooperative and aggressive. This suggests that excluded people are not indiscriminately antisocial, but respond to prosocial behaviour, but which is based on a untrusting and wary attitude.

Similarly, in Experiment 3 of Twenge et al. (2001), participants experienced a social exclusion manipulation ("living alone" paradigm) and then received feedback apparently from the source of rejection on an essay they had written. Excluded participants who received negative feedback behaved aggressively by giving a critical job evaluation to their interaction partner. In contrast, excluded participants who received praise were not more aggressive towards the interaction partner who had praised them than the control group. This experiment demonstrates that excluded participants are not aggressive across absolutely all situations, and moreover that some friendly treatment can prevent the aggressive response.

In four further experiments, Twenge and his colleagues further explored this issue (Twenge et al., 2007). They could show that rejection-induced aggression is considerably reduced by a friendly social interaction (i.e.: Thanks and candy after the rejection

manipulation given by the experimenter, by writing about either family members or a celebrity).
A traditional mood induction had no effect on aggressive behaviour, showing that an encounter, real, remembered or imagined, must be social to be effective. These studies accentuate and verify the central role of feeling disconnected, as they replicate the rejection-induced aggression, but also show that it can be prevented by positive social contact.

2.8. Mediators between ostracism and its responses

The review of these studies suggests that ostracized, socially excluded, and rejected individuals are capable of responding in a variety of ways, many of which appear to be quite contradictory. One would expect a behaviour which helps to replenishing the threatened social connectedness (e.g.: Baumeister et al., 2007a), but, as illustrated above, such behaviours and manners are seldom to find as a response to exclusion. Prosocial behaviour, for example, which would clear the way for new social attachment and feeling of connectedness, was hardly found after a treatment of exclusion (Twenge et al., 2007a). Bases on these findings and assumptions, several studies tried to find mediating factors, interindividual and situational ones, which may help explain these contradictory results. First, mood was proposed to mediate between rejection or exclusion and whatever behaviour would follow. Unfortunately, besides the fact that the hypnotized exclusion-induced emotional distress (see above, Williams, 2001) could in most cases not be substantiated, it failed to mediate between exclusion and the behavioural effects (Twenge et al., 2001; Twenge et al., 2002; Twenge et al., 2003; Twenge et al., 2007). These results apply also to studies in which the treatment did produce significant main effects on mood (e.g.: Buckley et al., 2004; Williams et al., 2000).
The needs self-esteem and belongingness failed to mediate between exclusion and response, too (Twenge et al., 2007a; Twenge et al., 2007). Thus, the levels of needs are in fact shuttered by ostracism, rejection, and exclusion, but they seem not directly to be responsible for different behavioural responses. Inconsistent findings were found concerning the need to control one's social environment; namely Twenge et al. (2007a) found no mediation of control. In contrast, Warburton et al. (2006) could show that actual control over an aversive stimulus had an influence on aggressive behaviour. Participants were ostracized using the ball-tossing paradigm, and were then exposed to an aversive noise, the onsets over which they had either control or no control. Aggression was measured with the hot-sauce paradigm. Ostracized participants who had no control over the noise were the most aggressive, assigning the target person to eat four times as much

hot sauce as participants in the other conditions. Thus, when ostracized participants could not control an aversive situation, they were more aggressive toward an innocent target. These results support the assumption of Williams model of ostracism that threatened need to control may lead to aggressive behaviour.

Twenge et al. could prove that empathy and trust serve as a mediator between rejection and aggressive behaviour (Twenge et al., 2007a; Experiment 7; Twenge et al., 2007, Experiment 4). Participants who were rejected by the group but then wrote about a valued best friend not only scored higher on trust, measured with 2 items assessing willingness to trust "most people", but were correspondingly less aggressive than the rejected participants who wrote about the neutral topic. The researcher concluded that thinking about one's best friend seems to restore one's readiness to trust people in general, even after trust had been shattered by the rejection experience. However, in their studies concerning the decrease of pro-social behaviour (Twenge et al., 2007a; Experiment 6), trust did not mediate the relationship between rejection and behaviour.

Buckley et al. (2004) investigated the moderating effects of trait variables agreeableness and rejection sensitivity, revealing that both traits failed to moderate the reactions to rejection, including negative emotions as anger, hurt feelings or anxiety, the inclination to behave antisocially, and actual aggressive behaviour.

Narcissism, examined by Bushmann & Baumeister (1998) and Kirkpatrick et al. (2002), was proved to be a predictor of aggressive behaviour after a negative feedback. No form of exclusion was realized in these studies. Similarly, Zadro & Williams (2006) could show that social anxiety influences the persistence of the detrimental effects of ostracism, but this trait did not moderate the response itself, either.

More promising was the investigation of social cognition. In a very recent series of experiments, DeWall et al. (2009a) found increases in hostility-related cognitive processes in participants who experienced social exclusion compared to socially accepted and control participants. Excluded participants rated aggressive and ambiguous words as similar, completed word fragments with aggressive words, and rated the ambiguous actions of another person as hostile. Interestingly, hostile cognitions substantially mediated the relationship between social exclusion and aggression.

In sum, the search for moderating situational and dispositional factors goes on. A considerable amount of possible mediators has been investigated, but still some aspects are left untouched.

On the side of situational factors, it might be interesting and worthwhile for example to examine the nature of the insult or the provocation which elicit aggressive behaviour.

According to common observations, it requires more than one single insult till the target acts aggressively. Does exposure to a constantly increasing provocation lead to stronger aggressive reaction in ostracized individuals?
Furthermore, ostracism, rejection, and social exclusion outside the laboratory happen within social bonds. If an excluded individual reacts with anger and hostile behaviour towards the source of this treatment, he or she faces revenge or vengeance. Thus, does ostracism increase the likelihood of aggressive behaviour even in face of retaliation?
On the side of individual differences and traits, for example aspects of coping with stress and experience and expression of anger and aggression are not investigated, yet.
There are few more stressful events than the threat of fundamental needs; nevertheless dispositional factors concerning responses and coping with stress are not considered as possible mediators, yet. Does a provocation after ostracism (or related paradigms) facilitate an aggressive response in individuals with high sensibility to stress? Similarly, individual differences in attitude towards vengeance or low levels of social responsibility may make aggressive behaviour more likely. Additionally, a dispositional bias towards anger or aggression as well as their expression (i.e.: controlled, inwards or outwards directed, reactive, proactive or inhibit anger, respectively aggression) may mediate the relation between ostracism, rejection or social exclusion and aggressive behaviour. This idea is supported by the fact that cognitive biases for aggression- or anger-related material have been previously reported in individuals with high levels of trait anger (van Honk, Tuiten, de Haan, van den Hout, & Stam, 2001; van Honk, Tuiten, van den Hout, Putman, de Haan, & Stam, 2001) and hostile cognitions mediate the relationship between social exclusion and aggression (DeWall et al., 2009a).
The aim of the present study is to address these questions. To investigate the situational aspects of increasing provocation and anticipated retaliation, a combination of the Cyberball paradigm (Williams & Jarvis, 2006) to induce ostracism and the Taylor Aggression Paradigm (TAP, Taylor, 1967) to provoke and measure aggression is used.
In addition, two versions of the TAP are used to investigate if the effects of ostracism and provocation differ when the aggressive behaviour causes either a physical pain or a monetary setback for another person.
First, the inclusionary status (ostracism vs. inclusion) of 65 students (male and female) was manipulated using the Cyberball game. Next all participants performed one of the two version of the TAP. Half of the participants of each inclusionary status group were exposed to continuously increasing levels of provocation (high provocation group), while the others received constantly low levels of provocation (low provocation group). The two versions of

the TAP differed in types of provocation and aggressive behaviour. The *noise* version corresponded to the Taylor Aggression Paradigm explained above. The punishment was carried out by the exposure to loud noise. In the *m*oney version, punishment was achieved with deduction of money.

To explore dispositional factors concerning coping with stress and trait bias of anger and aggression, several trait questionnaires were used, which are specified in Chapter 3.

Based on the status quo of research of ostracism, rejection and social exclusion, the following hypotheses are taken as a basis for the present study.

3. Hypotheses

I. Threat of Needs:

Ostracism is supposed to lead to a decrease of self-esteem, feeling of belonging, sense of control, and meaningful existence.

II. Aggressive Behaviour:

Ostracism in combination with high levels of provocation is supposed to lead to enhanced aggressive behaviour.

III. Mood

Ostracism should lead to an increase in negative mood, especially of anger and a decrease in positive mood.

IV. Mediation

No mediation of negative mood in general or anger in special is expected.

V. Dispositional factors

Several trait variables are investigated concerning the mediation between ostracism and aggressive behaviour. No specific hypotheses are assumed, but an explorative analysis is reported.

4. Material and Methods

In the following chapter, participants, material and methods as well as the procedure of the present study will be presented. The Cyberball paradigm, utilised to manipulate the inclusionary status, and the TAP, utilised to provoke and to measure aggression, are described in detail. The chapter concludes with a description of the statistical analyses.

4.1. Participants

Thirty-three female and thirty-two male students of the University of Trier (mean age 21.55 years, SD= 2.23; range= 19−29 years) took part in the study. To make sure that the participants had no experience with psychological studies, only first-year undergraduates of psychology and students of other academics were accepted. Participants volunteered to take part in the experiment in return for course credit. In addition, participation was compensated with €7. The study was approved by the local ethics committee. The participants were randomly assigned to a 2 (TAP-version: money vs. noise) x 2 (Inclusionary Status: inclusion vs. ostracism) x 2 (Provocation: high vs. low provocation) between-subject design, but sex was balanced across groups (four male and female participants in each group). Three students of the same sex, who were not friends with each other, meet each other right before the experiment. They were run in groups of three, although they were kept in separate rooms as soon as the experiment started.

4.2. Materials

4.2.1. Pre-experimental questionnaires

After signing the informed consent and providing biographical data (e.g.: age, sex, number of close friends, and how many roommates they had), participants had to fill out four trait questionnaires in random order: The German "Stress-Reaktivitäts-Skala" (SRS) (Schulz, Jansen Lars J., & Schlotz Wolff, 2005), the German version of State-Trait-Anxiety-Inventory (STAI) (Laux, 1981), the German "Fragebogen zur Erfassung von Aggressivitätsfaktoren" (FAF) (Hampel, 1998), and a German questionnaire dealing with the perception of and the attitude towards justice, which contains the "Glaube an eine gerechte Welt als Motiv" (Dalbert, Montada, & Schmitt, 1987, Schmitt, 1997), "Sensibilität für widerfahrene Ungerechtigkeit" (Schmitt, 1995, Schmitt, 2005), a German version of the State-Trait Anger Expression Inventory (STAXI) (Schwenkmezger, 1992), "Relationalitäts-Kontextabhängigkeits-Skala" (RKS) (Gollwitzer, 2006),"Skala der sozialen Verantwortung"

according to Berkowitz and Daniels (Bierhoff, 2000), and German version of the Vengeance Scale (Stuckless, 1992).

4.2.2. State questionnaire

PANAS state

The German version of the Positive Affect Negative Affect Schedule (PANAS; Krohne, Egloff, Kohlmann, & Tausch, 1996), a psychometric scale developed to measure the largely independent constructs of positive and negative affect, was used to assess current self-reported mood four times during the experiment: at the beginning of the experiment (PANAS 1), after the Cyberball game (PANAS 2), after the Taylor Aggression Paradigm (PANAS 3), and after the Emotional Stroop Task (PANAS 4). This scale consists of ten rather positive (e.g.: interested, inspired, energetic) and ten rather negative adjectives (e.g.: nervous, irritable, anxious). The participants had to rate how much they currently felt on a five point rating scale. Besides measuring positive and negative affect, the questionnaire provides a measurement for specific negative moods, such as anger.
From self-reported mood, three variables were analyzed: positive and negative affect and anger.

4.2.3. The Cyberball

Cyberball, a virtual ball-tossing game developed by Williams and Jarvis (2006), operationalizes ostracism in the laboratory. This paradigm has been shown to reliably induce ostracism as defined as being excluded and ignored (Williams, 2001) in several studies (e.g.: Warburton et al., 2006; Williams et al., 2000; Williams et al., 2002; Zadro et al., 2004; Zadro & Williams, 2006).
We used a cover story, translated in German, which is provided by the developer. Participants were told that they were playing this game with the other participants, whom they met prior to the experiment. They were informed that the game was merely a means for them to engage their mental visualization skills and that therefore performance in the game was of no importance. They were asked to create a mental picture of the team-mates, the setting and themselves. The game depicts three ball-tossers, the middle one representing the participant as shown in Figure 1.
The icons are animated throwing the ball to one of the two team-mates. When the participant received the ball, she or he was instructed to press "1" on the keyboard to pass the ball to the player on the left side of the screen and "2" to throw it to the one on the

right side of the screen and the ball would move toward that recipient. The names of the three participants, who took part at the same time, appeared on the screen.
Once the instructions were read, the participant clicked the "Next" link to start the game. Although we took an effort to make the participants believe that they were playing this game together, actually they were not. The number of balls passed to the participant was set in advance by the experimenter taking into account the particular experimental condition. If randomly assigned to the *inclusion* condition, participants received the ball for roughly one-third of the total throws. If assigned to the *ostracism* condition, participants received the ball twice at the beginning of the game, and for the remaining time, never received the ball again.

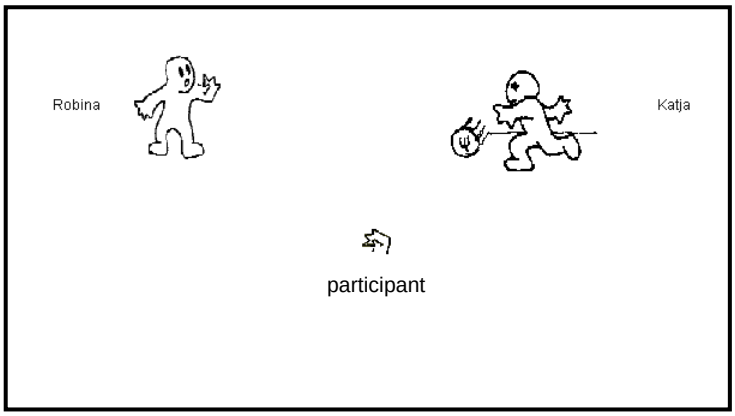

Figure 1: Cyberball- icons and Arrangement of the Player.

The game was set for 30 total throws lasting approximately five minutes.

4.2.4. Taylor Aggression Paradigm

The Taylor Aggression Paradigm (TAP, Taylor, 1967) was used in two modified versions to elicit and assess aggression. The TAP, utilized successfully several times in the context of social exclusion and aggression studies (e.g.: Bertsch, Böhnke, Kruk, & Naumann, 2009, Bushmann & Baumeister, 1998 ,Twenge et al., 2001, Twenge et al., 2003, Twenge et al., 2007, Warburton et al., 2006), has shown good construct, external, discriminant, and convergent validity (Anderson et al., 1999; Bernstein et al., 1987; Giancola & Zeichner, 1995; Giancola & Chermack, 1998).
Consistent with the cover story, the participants were led to believe that they were playing a competitive reaction time game with one of the other participants, whom they met prior to the experiment and with whom they played the Cyberball game. Participants were asked to react as fast as possible to a green square by pressing a key and they were told that whoever responded slower would receive a punishment. This punishment was defined

before each trial for each player by the other player. After each of the 30 trials, the participants received feedback about whether they won or lost this trial, as well as about the opponent's settings. Figure 2 shows the feedback for an exemplary trial for each version. The 30 trials were split into three blocks of ten trials each.

Actually, the participants did not play against each other and the outcome of the trials was held constant for all participants – each of them won and lost half of the trials. Moreover, the "opponent's" settings for the punishment of the participant were defined in advance according to the experimental condition and the block. The "opponent's" settings were used to provoke aggressive behaviour.

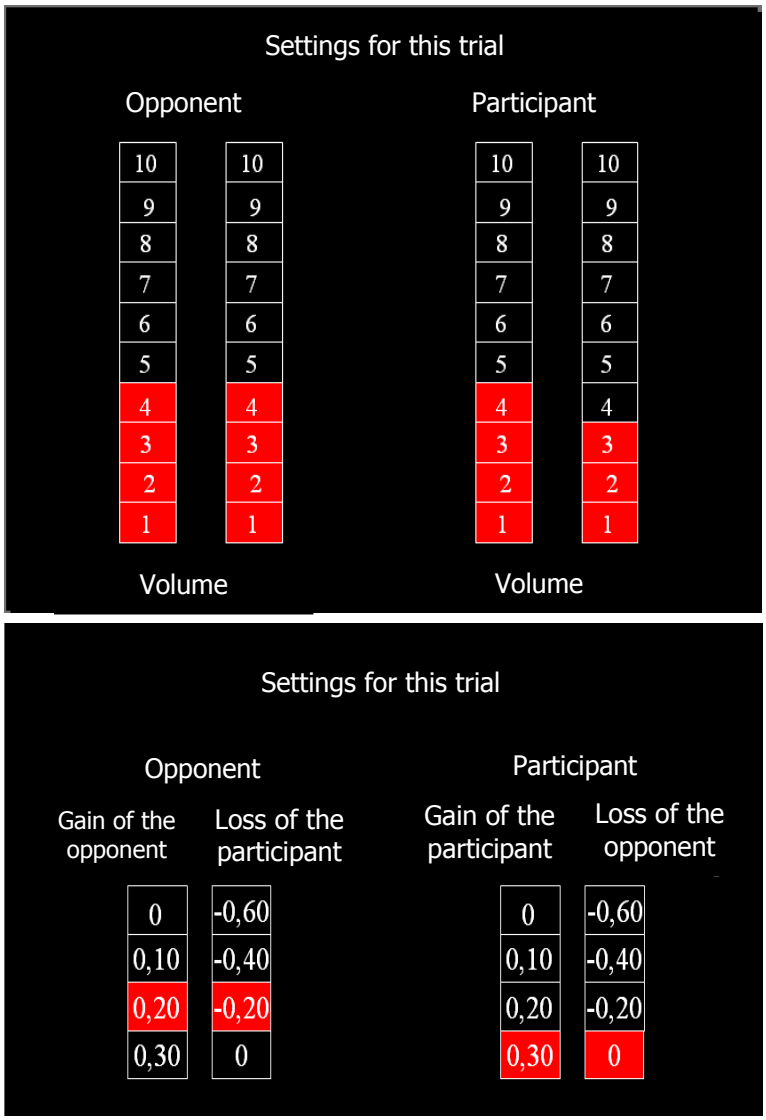

Figure 2: Setting for an Exemplary Trail of the TAP;
above the Noise Version, below the Money Version

Participants of each inclusionary status condition were randomly assigned to the conditions "high provocation" and "low provocation". The "high provocation" group received a

gradually increased provocation achieved by a stepwise increase of the punishment from block one to three. The "low provocation" group received a light punishment which remained constant over all three blocks.
Two different versions of the TAP were used, which varied in type of the punishment.

Noise version

In this version, the punishment consisted of a blast of noise applied over headphones. Volume and duration of this noise were adapted according to the experimental condition. During the first block, all participants of the noise version received short and gentle noises when they lost a trial (volume: *M* = 62.5 dB, range 0−70 dB; duration: *M* = .075 s, range 0−1.5 s). Participants of the low provocation group received noises of the same volume and duration during the whole 30 trials, whereas for participants of the high provocation group conditions changed the second and third block. These participants were exposed to noises of intermediate volume and duration in the second block (volume: *M* = 82.5 dB, range 75−90 dB; duration: *M* = 2.75 s, range 2−3.5 s) and of high volume and duration in the third block (volume: *M* = 99 dB, range 90−105 dB; duration: *M* = 4.4 s, range 3.5−5 s) when they lost a trial. The volume and duration settings of the participants were recorded in each trial from 0 to 10. For each participant and each trial, an average of the volume and duration setting was computed, except for those trials in which one of the settings was 0. In that case, the total score was set to 0, since no noise would have been presented to the opponent and this trial would not have constituted an aggressive act. Finally, the 10 trials which belonged to one block of TAP were averaged for each participant. These values were then used as the dependent variable of aggressive behaviour in the statistical analysis.

Money version

In the money version, the participants were told that they could gain up to €7 in the TAP. All participants started with a deposit of €4. In each trial, they could chose whether they would like to gain 30 Cents without taking money from their opponent's account, gain 20 Cents and take 20 Cents from the opponent, gain 10 Cents and take 40 Cents from the opponent, or gain 0 Cents and take 60 Cents from their opponent's account (see Figure 2). During the first block, all participants of the money version lost no or only very small amounts of money (*M* = -10 Cents, range 0 to -20 Cents). Participants of the low provocation group received the same settings during the second and third block as well. As in the noise version, the conditions changed for the participants of the high provocation group during block 2 and 3. They were exposed to intermediate losses of money in the

second (*M* = -30 Cents, range 0 to -60 Cents) and greater losses in the third block (*M* = -48 Cents, range -20 to -60 Cents). For each participant the deduction of the opponent's money of 10 trials which belonged to one block of the TAP were averaged. These values were used as the dependent variable of aggressive behaviour in the statistical analysis.

4.2.5. Post-experimental questionnaires

At the end of the experiment, participants had to fill out a questionnaire concerning the virtual ball-tossing game and the TAP. Participants were asked to state on a five point scale (1= not at all, 5= very much) how they felt during the Cyberball and the TAP, respectively. Along the lines of previous experiments (Williams et al., 2000; Zadro et al., 2004; Zadro & Williams, 2006), this questionnaire contains 12 items measuring the effect of the Cyberball game on the fulfilment of the four needs belonging, control, self-esteem, and meaningful existence. Moreover, seven items assessed feelings of anger, one item feelings of anxiety, two items the enjoyment of the task, and two more items feelings of rejection during the ball-tossing game. The latter can be regarded as a manipulation check to confirm participants' perception of their inclusionary status during the Cyberball game. As a further manipulation check participants had to state in percent how often the ball was passed to them.

Similar to the scales for the Cyberball, we also asked the participants in the post-experimental questionnaire how they felt during the TAP. Seven items recorded feelings of anger, two items the enjoyment of the game. One item assessed feelings of anxiety caused by the team-mates. Another two items measured aggression by asking which setting they would choose if they would play again with the same team-mate and a new one, respectively. Additionally the current feelings regarding the team-mates were measured.

4.3. Procedure

The investigation took place from November 2007 to December 2007.

The participants were told that we investigated the mental visualization on a reaction-time task. The general procedure is shown in Figure 3.

Arriving at the laboratory, the three participants were introduced to each other. They were told that they would play a ball tossing game with each other during the course of the experiment. Afterwards they were seated in separated adjoining rooms, doors open until the start of the Cyberball task. Following the introduction, participants had to fill out several trait questionnaires (see above). Next, they had o fill out the state version of the PANAS for the first time. When all participants finished this, the experimenter asked them to start the Cyberball game. Before and after the Taylor Aggression Paradigm, they had to

fill out the mood questionnaire for the second and third time. Then participants performed an emotional Stroop task, the results of which won't be discussed in the present diploma thesis. After this Emotional Stroop Test, they answered the mood questionnaire the last time together with the post experiment questionnaires (see above). After an elaborate debriefing, each participant received 7€. The whole experiment lasted less than 1.5 h.

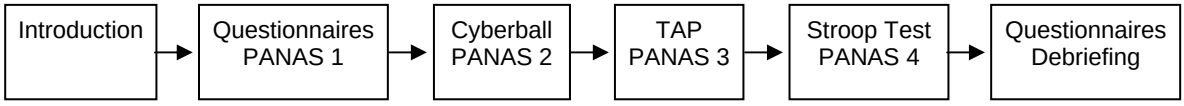

Figure 3: Procedure of the Study

4.4. Statistical analysis

The test of normal distribution revealed a significant divergence to the normal curve of distribution, but since the Anova is robust concerning this violation if the *df* is greater than 40 (Bortz, 2005), we decided to use this method nevertheless. Moreover, similar analysis with logarithmised data of the TAP revealed the same results as not logarithmised data, which could count as a support to work with the original data. The Levene- Test and the test for homogeneity of variance were not significant.

The data collected in the TAP were z- standardized. First 2 x 2 x 2 x 2 x 3 mixed-design analyses of variance (ANOVAs) were performed including the factors inclusionary status (inclusion vs. ostracism; between-subject), provocation (high vs. low provocation; between-subject), sex (male vs. female participants; between-subject), TAP group (*money* vs. *noise* version), and TAP block (Block 1, 2, 3; repeated measures) to analyze effects of ostracism and provocation on aggressive behaviour in the TAP. Second, separate 2 x 2 x 2 x 3 mixed-design ANOVAs were performed for each of the two versions of the TAP with the factors inclusionary status, provocation, sex, and TAP block (Block 1, 2, 3; repeated measures) to analyze effects of ostracism and provocation on aggressive behaviour. Third, the first trial of the first block of each version was analyzed with separate 2 x 2 x 2 univariate analysis of variance with the factors inclusionary status, provocation, and sex, as this measure of aggression is often used in studies examining the influence of exclusion on aggressive behaviour in the original TAP (e.g.: Bushmann, 1995; Twenge et al., 2007). Fourth, we performed several mixed-design ANOVAs, including the factors inclusionary status, provocation, TAP version, and sex, to reveal effects of ostracism and provocation on subjective measures (state anger, positive and negative affect, rejection), need satisfaction (belongingness, control, self-esteem, and meaningful-existence), and further mood variables of the post-experimental questionnaire. The data of the PANAS (positive,

negative mood and anger, respectively) for measurement point 1, 2 and 3 were z-standardized and a 2 x 2 x 2x 2 x 2 mixed-design ANOVA for each mood measurement was performed with the above mentioned factors inclusionary status, provocation, sex, and TAP version. PANAS 2 and 3 were used as repeated measures and PANAS 1 was used as a covariate for each mood measurement, respectively. For the self-reported measurements of the post-experimental questionnaire several mixed design ANOVAs were performed for each TAP version separately with the factors inclusionary status, provocation, and sex. Correlations between Inclusionary Status and responses in the TAP were calculated as a basis for the mediator analysis.

In the figures, non-standardized variables are depicted to facilitate the interpretation. 95% confidence intervals (CI) are depicted as well.

For all ANOVAs, the degrees of freedom were Huynh-Feldt corrected if the assumption of sphericity was violated (Huynh & Feldt, 1976). All statistical analyses employed a two-tailed alpha of .05. Effect sizes of significant results are reported as proportion of explained variance (partial eta squared [η^2]). In case of significant effects, we used Dunn's Multiple Comparison Tests as well as Pearson product moment correlations as post hoc tests. All statistical analyses were conducted with SPSS for Windows (Version 17.1, SPSS Inc.). Degrees of freedom vary slightly in the analyses of occasional missing data in subjective measures and post-experimental questionnaires.

5. Results

In this chapter, the results of the present work will be outlined starting with the manipulation check. Afterwards the results concerning the hypotheses are presented consecutively. In each case, the descriptive statistic will be presented first, followed by the inferential statistics.

5.1. Manipulation check

5.1.1. Ostracism

Table 1 depicts means and standard error of different variables testing whether the manipulation of the Inclusionary status was successful. The structure of the means suggests a successful manipulation of the inclusionary status. Ostracized participants declared to feel more rejected (ostracism: $M = 2.800$, $SE = 0.196$; inclusion: $M = 1.406$, $SE = 0.199$) and less included than included participants (ostracism: $M = 4.781$; $SE = 0.141$; inclusion: $M = 2.219$, $SE = 0.143$). Moreover, they perceived correctly that they received the ball less often than their virtual team-mates (ostracism: $M = 1.213$, $SE = 0.137$; inclusion: $M = 2.479$, $SE = 0.141$). The variance of all three items was rather low.

Table 1: Manipulation Check; the Effect of Ostracism on the Feeling of Rejection and Inclusion and on the Perception of Received Balls

Dependent Variable	Ostracised		Included	
	M	*SE*	*M*	*SE*
Feeling of Rejection (1= not at all, 5= very much)	2.800	0.196	1.406	0.199
Feeling of not Being Included (1= not at all, 5= very much)	4.781	0.141	2.219	0.143
Received Balls (1 = 0%, 2= 25%, 3= 50%, 4= 75%, 5= 100%)	1.213	0.137	2.479	0.141

The inferential statistical analyses supported the descriptive results. The manipulation of being ostracised in the Cyberball game caused significant greater feelings of rejection (Feeling of rejection: $F_{(1,49)} = 24.90$, $p < .000$, $\eta^2 = .77$; Feeling of not being included: $F_{(1,49)} = 162.91$, $p < .000$, $\eta^2 = .34$). The amount of received balls reached significance, too ($F_{(1,46)} = 65.39$, $p < .000$, $\eta^2 = .59$).

5.1.2. Provocation

Participants in the high provocation group should show an increase in aggressive behaviour to increasing levels of provocation compared to their peers in the low provocation group. In Table 2, means and standard errors of aggressive behaviour in block 1 to 3 for both versions combined are depicted. As expected, participants descriptively showed more aggressive behaviour in block 2 and 3 than their peers in the low provocation group. As Figure 4 shows, this applies for each individual version, too.

Table 2: Manipulation Check: Influence of Increasing Provocation an Aggressive Behaviour in Block 1−3 in Both Version

Depended Variable Aggressive Behaviour	Low provocation		High provocation	
	M	*SE*	*M*	*SE*
Block 1	-0.149	0.137	-0.093	0.135
Block 2	-0.294	0.159	0.144	0.157
Block 3	-0.315	0.208	0.669	0.205

Note: z- standardised variables are presented

The results of the inferential statistical analyses revealed a main effect of provocation for both versions together ($F_{(1,98)} = 5.22$, $p < .050$, $\eta^2 = .10$). Participants who received high levels of provocation showed higher values in aggression behaviour over all three blocks compared to the control group. Additionally, a main effect of TAP block (repeated measure) was found, as well ($F_{(2,98)} = 6.22$, $p < .010$, $\eta^2 = .11$). Post-hoc tests showed that participants reacted significantly more aggressive in block 3 than in block 2 ($p < .050$) and block 1 ($p < .010$). This effect was found in Tap money version as well (*money version*: $F_{(2,48)} = 5.65$, $p < .010$, $\eta^2 = .19$) but not in TAP *noise version* ($F_{(2,50)} < 2.0$; $p < .100$). Moreover, the analyses confirmed the descriptive tendencies (see Table 2 and Figure 4), revealing a successfully experimental provocation of aggression in both versions together, and each version of its own (Interaction: provocation x TAP block (repeated measures): both version: $F_{(2,98)} = 13.21$, $p < .000$, $\eta^2 = .21$; *noise version*: $F_{(2,50)} = 10.48$, $p < .000$, $\eta^2 = .30$; *money version*: $F_{(2,48)} = 4.39$, $p < .050$. $\eta^2 = .16$), even though the effect was slightly smaller in the money version.

Post-hoc tests for both versions together revealed that highly provoked participants acted significantly more aggressive in block 2 and 3 compared to those of the low provocation group. Moreover, participants of the high provocation group reacted significantly more aggressive in block 3 compared to block 2 ($p < .050$) and block 1 ($p < .050$) (see Figure 4, left histogram). Post-hoc tests for the *noise* version revealed that participants, who

received intermediate (block 2: $p < .050$) and high (block 3; $p < .010$) provocation, acted significantly more aggressively than those, who received a constantly mild provocation during all trials. As expected, both groups did not differ in the first block, in which all participants were exposed to low levels of provocation. However, highly provoked participants reacted with increasing aggressive behaviour to the stepwise intensified provocation from block 1 to 3 ($p < .010$). Concerning the *money* version (see Figure 4, right histogram) the results were very similar to the ones of the *noise* version, except that under intermediate provocation, the participants were not significantly more aggressive than the control group in block 2, but under high provocation in block 3 they were ($p < .010$). Provoked participants showed an increase of aggressive behaviour from block 1 to 3 ($p < .010$) and from block 2 to 3 ($p < .050$). Please note that average of aggressive behaviour in this version is measured in mean monetary deduction (0.60€ at most)

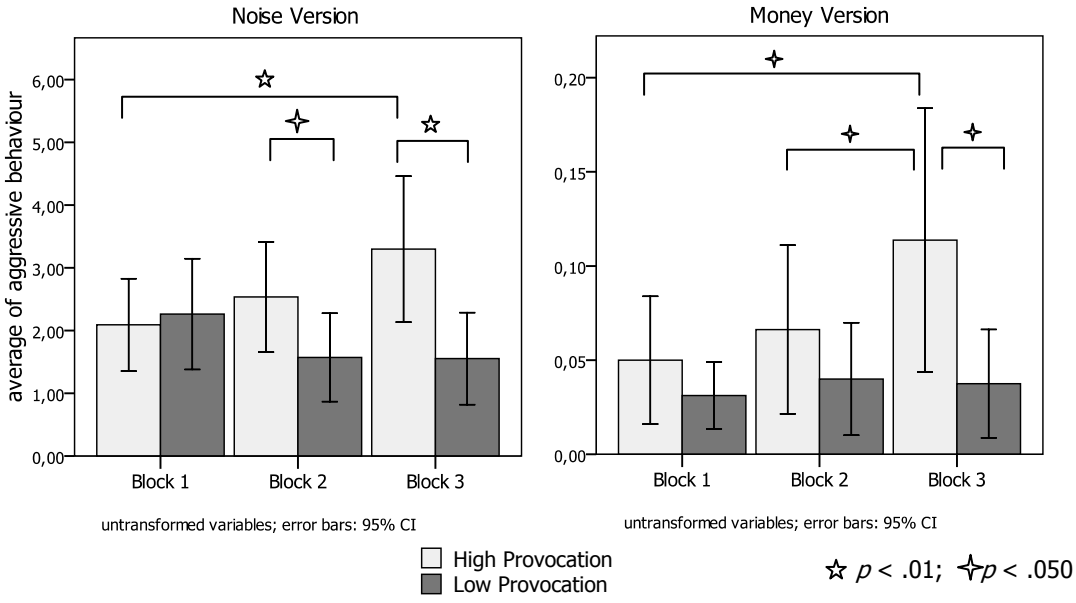

Figure 4: Manipulation Check: Provocation in TAP, Left: *Noise* Version; Right: *Money* Version

Results concerning the hypotheses

In this paragraph the results of the four hypotheses are presented. First, the results concerning the influence of ostracism on the four needs are described. Next, the results concerning the relationship between ostracism and aggressive behaviour in the Taylor Aggression Paradigm (TAP) task as well as the evaluation of the team-mate and self-reported future setting in the TAP are presented. Third, the results of the effect of ostracism on mood are outlined. The paragraph concludes with the results of the

mediation-hypothesis and the outcome of an explorative analysis of the correlation between dispositional factors and aggression considering the inclusionary status.

5.2. Hypothesis I: Threat of needs

Figure 5 depicts the means of self-reported levels of the four needs belonging, self-esteem, control and meaningful existence. Ostracized participants reported lower levels in all four needs compared to included participants. Interestingly, the need to control and the need to belong are threatened the most followed by meaningful existence. Self-esteem is shattered the least.

The ANOVA for each need revealed a main effect of inclusionary status, respectively (*belonging*: $F_{(1,49)} = 66.14$, $p < .000$; $\eta^2 = .57$; *self- esteem*: $F_{(1,49)} = 13.21$, $p < .001$; $\eta^2 = .21$; *control*: $F_{(1,49)} = 88.13$, $p < .001$; $\eta^2 = .64$; *meaningful existence*: $F_{(1,49)} = 4.83$, $p < 0.000$; $\eta^2 = .48$) as shown in Figure 5.

These analyses revealed no further significant effects (all *Fs* < 2.88, *ps* > .100).

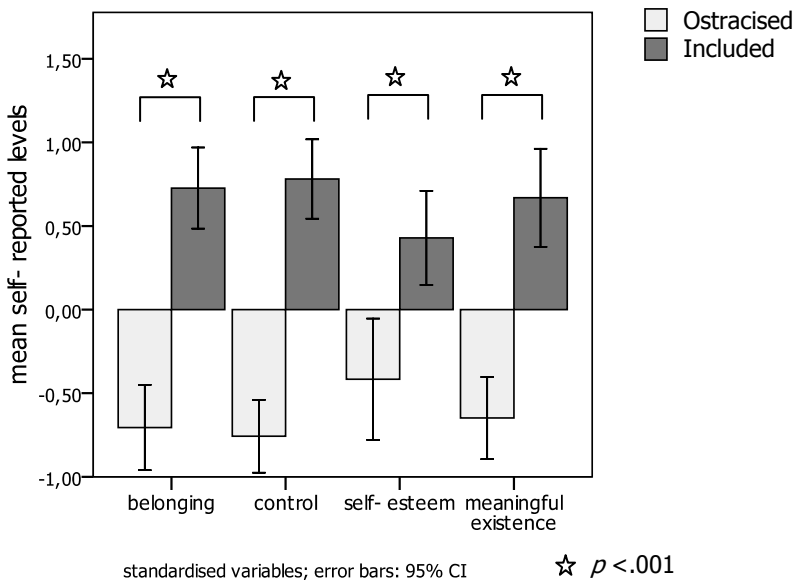

Figure 5: Influence of Ostracism on Self- reported Levels of Needs

5.3. Hypothesis II: Ostracism and aggressive behaviour

In the following section the relationship between ostracism and aggressive behaviour will be presented. First, the results concerning influences of inclusionary status on aggressive behaviour in the Taylor Aggression Paradigm will be outlined. Next, the results of the effect of inclusionary status on liking and getting to know the team-mates as well as on the specification on future settings while playing the TAP with the same or new team-mate will be presented. These forms of aggressive behaviour will be taken into account as they were

frequently cited in research of ostracism and aggression (e.g.: Twenge et al., 2001; Williams et al., 2002).

5.3.1. Ostracism and aggressive behaviour in the TAP

Table 3 depicts the aggressive behaviour in the first trial and block 1 to 3 in the TAP for ostracized and included participants. Ostracized participants reacted more aggressively than those, who were included in the first trial as well as in the entire block 1 and block 2. However, in block 3 included participants were more aggressive than ostracized ones.

Table 3: TAP; Relationship between Inclusionary Status and Aggressive Behaviour in the First Trial, Bock 1, 2 and 3

Dependent Variable Aggressive behaviour in the TAP (both versions)	Ostracised		Included	
	M	*SE*	*M*	*SE*
First trial of Block 1	0.10	0.18	-0.12	0.18
Block1	-0.04	0.145	-0.20	0.14
Block 2	-0.06	0.16	-0.09	0.16
Block 3	0.08	0.21	0.28	0.21

Which effect does the level of provocation have on this pattern?
Figure 6 presents the reactions of ostracized as well as included participants who were either exposed to high or mild provocation in the TAP.

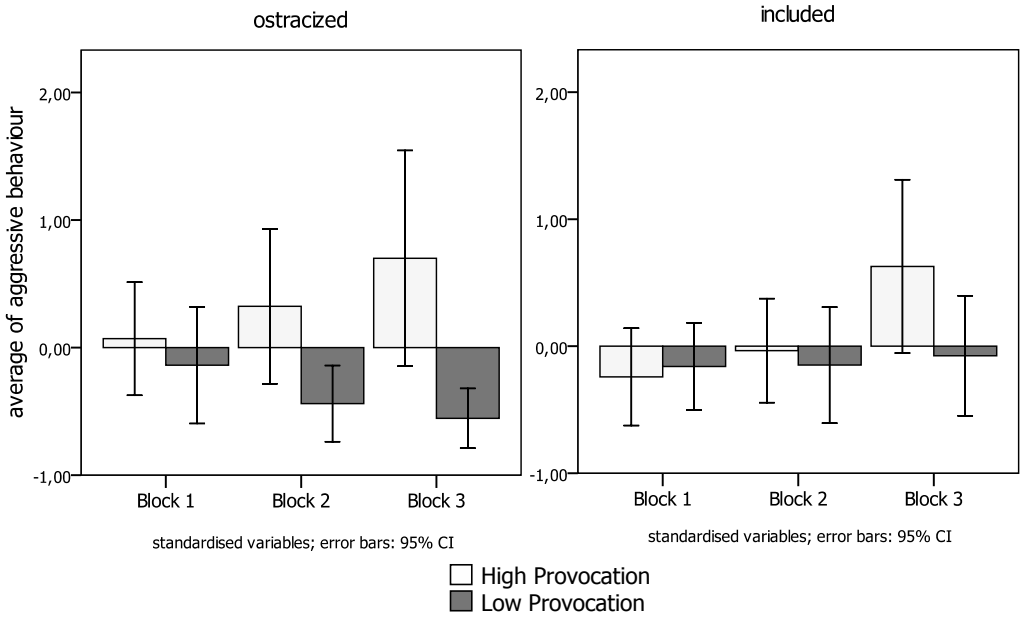

Figure 6: TAP Both Versions; Interaction between Inclusionary Status, Provocation and TAP Block

Highly provoked ostracized participants (Figure 6: left histogram, bright bars) react with increasing aggressive behaviour from block 1 to 3. In contrast to this, mildly provoked ostracized participants (Figure 6: left histogram, dark bars) reacted with strongly decreasing aggressive behaviour towards the constant mild provocation from block 1 to 3. However, mildly provoked included participants (Figure 6: right histogram, dark bars) reacted with constant non-aggressive behaviour towards the constant mild provocation from block 1 to 3. Similarly, highly provoked included participants (Figure 6: right histogram, bright bars) reacted with non-aggressive behaviour towards the mildly as well as intermediate provocation in block 1 and 2 and with suddenly strong aggressive behaviour concurrently to high provocation in block 3.

The analysis did not confirm this pattern, revealing no main effect of inclusionary status ($F_{(2,98)} < 1.00$, $p > .100$, n.s.) and no significant interaction between inclusionary status and TAP block ($F_{(2,98)} < 2.00$, $p > .100$, n.s.). This might be caused by the unanticipated declining aggressive behaviour of ostracized but mildly provoked participants, which abated the mean reaction of ostracized participants (see Figure 6). Additionally, the minor differences in the means of the first trial, as well as of block 1 and block 2 between ostracized and included participants is not sufficient for a significant difference (see Table 3). However, the analysis disclosed a marginally significant interaction between inclusionary status, sex, and TAP version ($F_{(1,49)} = 3.68$, $p < .100$; $\eta^2 = .07$). Posthoc tests revealed that included females reacted in the TAP *money* version more aggressively than included males.

To investigate this unexpected missing effect of inclusionary status both versions of the TAP were analysed separately.

Noise version

Figure 7 depicts the influence of inclusionary status on aggressive behaviour in the TAP noise version. Ostracized participants behave more aggressively in block 1, but less aggressively in block 2 and 3 than included ones. However, in sum ostracized participants seemed to be less aggressive than their included peers, irrespectively of the amount of provocation in the TAP. This was confirmed by the inferential statistical analysis, which revealed a significant interaction of inclusionary status and TAP block ($F_{(2,50)} = 3.84$, $p < .050$, $\eta^2 = 0.13$).

Post-hoc tests revealed that ostracised participants reacted significantly less aggressively than the included ones in the third block of the TAP ($p < 0.05$) (see Figure 7). The relationship between inclusionary status and provocation disclosed the following pattern: Ostracized participants reacted more aggressively under high provocation than under mild

provocation (ostracized highly provoke: block 1: *M* = 2.40, *SE* = 0.53, block 2: *M* = 2.73, *SE* = 0.54, block 3 *M* = 2.83, *SE* = 0.67; ostracized mildly provoked: block 1: *M* = 2.22, *SE* = 0.56, block 2: *M* = 1.23, *SE* = 0.57, block 3 *M* = 1.16, *SE* = 0.70), but included participants' level of aggressive behaviour exceeded their level under both intensities of provocation in TAP block 3, respectively (included high provoked: *M* = 3.79, *SE* = 0.71; included mildly provoked: *M* = 1.95, *SE* = 0.71 (*ps* > 0.100).

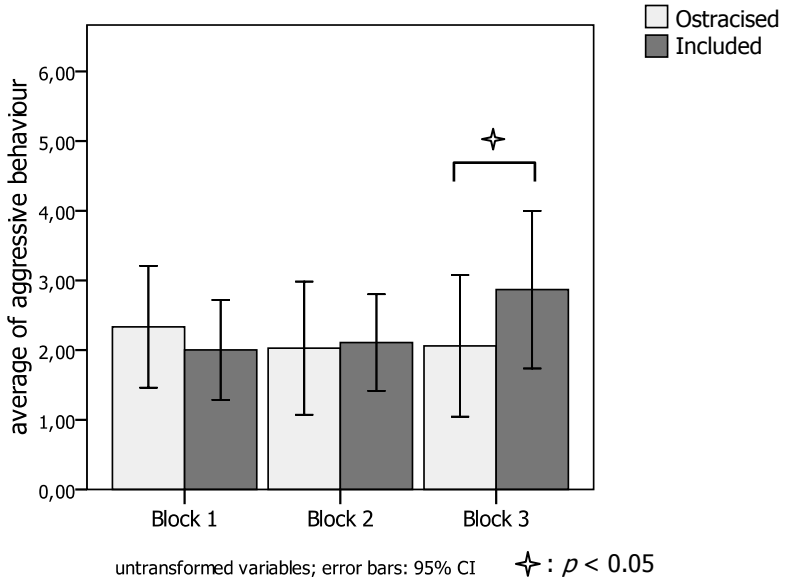

Figure 7: TAP *Noise* Version: Influence of Inclusionary Status on Aggressive Behaviour

Moreover, the change in aggressive behaviour from block 1 to 3 differed for highly provoked participants according to their inclusionary status. Ostracized highly provoked participants' settings for their opponents changed from $M_{block\ 1}$= 1.70 to M_{block2} = 2.83. In contrast to this, included highly provoked participants showed a stronger increase in aggressive behaviour from $M_{block\ 1}$= 2.40 to M_{block2} = 3.79 caused by increasing provocation. However, the analysis revealed no significant interaction between inclusionary status and provocation (*F* < 1.00).

Descriptively, ostracized participants behaved more aggressively in the first trial of block 1 (z-standardized variables: *M* = 0.06, *SE* = 0.25) than included participants (z-standardized variables: *M* = -0.08, *SE* = 0.25), as well. However, the analysis showed no significant results (all *Fs* < 1.50, all *ps* > 0.100*)*.

Money version

In the *Money Version*, the participants' sex seemed to have an important influence on aggressive behavior in the TAP. Table 4 depicts the influence of sex and inclusionary status on aggressive behaviour in general in the TAP. If ostracised, females reacted less aggressive than when included. However, being ostracised had the opposite influence on men: they deducted more money from their opponents compared to included males. Interestingly, included females constituted the group, which punished their opponents worst; included male punished their opponents the least.

Table 4: TAP *Money* Version; Interaction between Sex and Ostracism

Dependent Variable Aggressive behaviour over all three blocks	Ostracised		Included		F
	M	*SD*	*M*	*SD*	
Female	-,060 *(,052)*	,286 *(,023)*	,419 [a] *(,090)*	,286 *(,023)*	$F_{(1,24)} = 4.52$; $p < .050$; $\eta^2 = 0.16$
Male	,190 *(,072)*	,286 *(,023)*	-,549 [b] *(,013)*	,286 *(,023)*	

Note: z- standardised variables; in brackets the untransformed data. a, b: significant difference, p < .050.

This pattern was partially confirmed by the statistical analysis, revealing a significant interaction between sex and inclusionary status ($F_{(1,24)} = 4.52$, $p < .050$; $\eta^2 = 0.16$). Post-hoc tests showed that included females behave significantly more aggressive than included males ($p < .050$).

Table 5 outlines the aggressive behaviour of ostracized as well as included participants in the TAP *money* version.

Table 5: TAP *Money* Version; Relationship between Inclusionary Status and Aggressive Behaviour in the First Trial, Block 1, 2 and 3

Dependent Variable Aggressive behaviour in the TAP money versions	Ostracised		Included	
	M	*SE*	*M*	*SE*
First trial of Block 1	0.09	0.04	0.05	0.04
Block1	0.05	0.01	0.04	0.01
Block 2	0.06	0.02	0.05	0.02
Block 3	0.08	0.02	0.07	0.02

Ostracized participants behaved slightly more aggressively in the first trial than included ones. Moreover, although not depicted, highly provoked ostracized participants constituted the most aggressive group compared to included participants. However, the aggressive behaviour in block 1, 2 and 3 does not seem to be influenced by inclusionary status or an

interaction of this variable. Statistical analysis revealed no significant influence of inclusionary status on aggressive behaviour in the three blocks of the TAP *money* version ($F < 2.50$, $p > 0.100$).

The pattern of the relationship between inclusionary status and provocation differed from the one found in the TAP *noise* version (see Figure 8). Ostracised and highly provoked participants behaved most aggressively in all three blocks of the TAP compared to all other participants. Moreover, increasing provocation resulted in increasing aggressive behaviour. Interestingly, ostracized and mildly provoked participants showed the least aggressive behaviour in block 2 and 3. In general the deduced money was not much, participants' mean deduction did not exceed 0,15€.

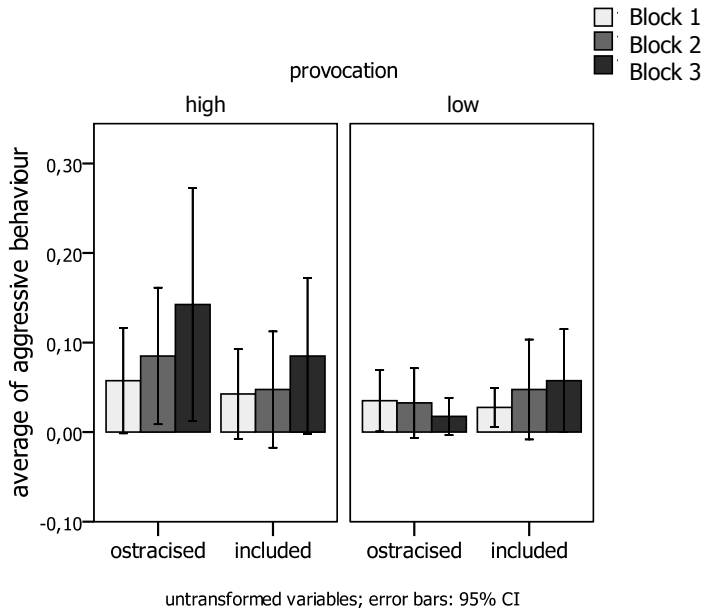

Figure 8: TAP *Money* Version: Influence of Inclusionary Status and Provocation on Aggressive Behaviour

Note: average of aggressive behaviour → mean deduction to the amount of 0,60€ at most.

However, the analysis revealed no significant interaction between inclusionary status and provocation ($F < 2.30$, $p > 0.100$).

The analysis of the first trial of the TAP showed no significant results (all $Fs < 2.00$, all $ps > 0.100$), either.

5.3.2. Additional analysis: further results of TAP money version

Figure 9 presents the effects of sex on aggressive behaviour in block 1 to 3. Female participants reacted more strongly to the provocation than their male peers. The analysis revealed an interaction between gender and TAP block ($F_{(2,48)} = 3.29$; $p < .050$; $\eta^2 = 0.12$). Females substracted significantly more money from their opponents from block 1 to

3 (p < .001) and more in block 3 compared to the male participants (p < .001). Note that this was irrespective of the amount of provocation.

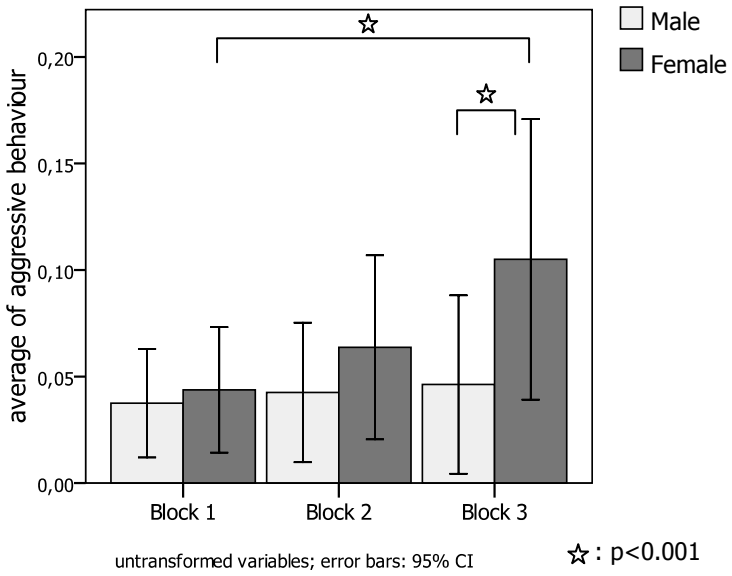

Figure 9: TAP *Money* Version: Influence of Sex on Aggressive behaviour

Note: average of aggressive behaviour → mean deduction to the amount of 0,60€ at most.

5.3.3. Ostracism and evaluation of the opponents and self-reported future settings in the TAP

Evaluation of the team-mates

Figure 10 depicts the interaction between inclusionary status and provocation on the liking of the team-mate in the TAP. Descriptively, participants who were highly provoked liked their team-mate slightly less than those participants who were mildly provoked. Interestingly, ostracized participants who were highly provoked liked their team-mate more than included and highly provoked as well as ostracized and mildly provoked participants. The analysis confirmed this pattern, revealing a significant interaction between Inclusionary status and provocation ($F_{(1,48)}$ = 4.08. p < .050; η^2 = .08). The post-hoc test showed that included participants liked their team-mate significantly more under low than under high provocation conditions (p < .050).

Moreover an interaction between TAP version and provocation also reached significance ($F_{(1,48)}$ = 4.08; p < .050; η^2 = .08). Highly provoked participants in the TAP *money* version (M = 2.88, SE = 0.22) evaluated their team-mate as less friendly than mildly provoked ones (M = 3.58, SE = 0.22). In the TAP *noise* version, participants did not differ in their

evaluation under high (*M* = 3.38, *SE* = 0.21) and low provocation (*M* = 3.19, *SE* = 0.22) provoked).

The three way interaction inclusionary status, provocation, and TAP version was significant, too ($F_{(1,48)}$= 4.87, $p < .050$, $\eta^2 = .09$). Post-hoc tests revealed that ostracized and highly provoked participants liked their team-mates better in the TAP *noise* version (*M* = 4.03, *SE*= 0.30) than in TAP *money* version (M= 2.63; *SE*= 0.32, $p < .050$).

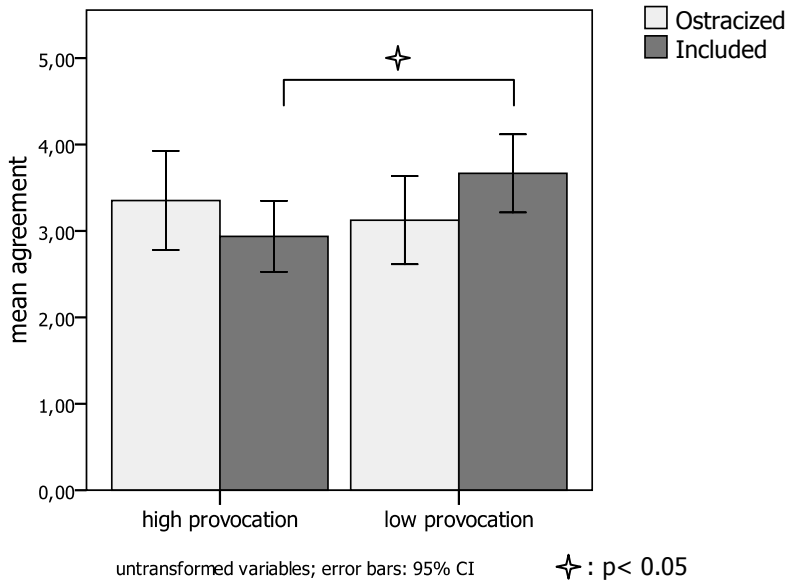

Figure 10: Influence of Inclusionary Status and Provocation on Liking the Team-mate

Although no other differences reached significance, it is noteworthy that ostracised and highly provoked participants in the *noise* version evaluated their opponents the friendliest compared to all other conditions across the two TAP versions. No further effects were found (all *Fs* < 3.50, *ps* > .050). The analysis of the second question of whether participants would like to get to know their team-mates better, showed no significant results ((all *Fs* < 3.50, *ps* > .050; *M* = 2.78; *SE* = 0.16).

Self-reported future settings in the TAP

Table 6 outlines the self-reported future aggressive behaviour for both versions of the TAP. In the TAP *noise* version, highly provoked participants reported more future aggressive behaviour playing with the same team-mate than with a new team-mate. The opposite pattern is found in the low provoked group. In the TAP *money* version the level of provocation does not seem to influence the self-reported future aggression. Highly and mildly provoked participants wanted to deduct more money from the same team-mate in a future game than from a new one. The analysis of the self- reported aggressive behaviour if playing the TAP once more a) with the same playmate or b) with another one, showed

somewhat contradictory results for the main effect for level of provocation (see Table 6; noise version: a: $F_{(1,25)} = 4.46$, $p < .050$; $\eta^2 = .15$; b: $F_{(1,25)}=0.02$; $p > .010$; n.s.; money version: a: $F_{(1,21)} = 3.05$, $p < .100$; $\eta^2 = 0.13$; b: $F_{(1,23)} = 3.15$, $p < .100$; $\eta^2 = 0.12$).

Table 6: Main Effect of Provocation on Self reported Anger concerning the TAP, Both Versions; Post-experiment Questionnaire

	TAP *noise* version				TAP *money* version			
	High provocation		Low provocation		High provocation		Low provocation	
Dependent Variable	*M*	*SE*	*M*	*SE*	*M*	*SE*	*M*	*SE*
Self reported aggressive behaviour in future TAP								
a) with the same playmate	3.98	0.68	1.94	0.69	0.10	0.3	0.03	0.03
b) with another playmate	1.98	0.42	2.06	0.43	0.06	0.02	0.01	0.02

Note: self reported aggressive behaviour unit is identical to the unit of the data of each TAP Version

Participants who were highly provoked chose significantly higher levels for a future TAP turn than mildly provoked only when playing with the same team-mate, but not when playing with another one. The reported settings for the same team-mate were about as high as those of the TAP block 3. This effect was highly significant for the TAP version noise, however less strong for the money version.

5.4. Hypotheses III: Mood

The following section outlines the results concerning the influence of inclusionary status on self-reported mood. First, the results of the PANAS at measurement point two, after the Cyberball and measurement point three, after the TAP, are presented. Then the results of the mood measurement of the post-experimental questionnaire are shown. The section concludes with the results of the analyses referring to the mediating role of mood between inclusionary Status and aggressive behaviour

5.4.1. Mood measured with the PANAS

Means and standard errors of self-reported levels of positive and negative affect as well as anger at measurement point two and three are depicted in Table 7. Descriptively, ostracized participants reported lower levels in positive affect at both measurement points. Yet, they experienced more negative affect and anger after the Cyberball game than included participants. However, after the TAP, ostracized participants reported lower levels of negative affect and anger compared to their included peers.

It is interesting to note that the change in negative mood and anger from the second to the third mood measurement differed descriptively between included and ostracized participants. Whereas included subjects reported more negative affect and anger after the TAP than after the Cyberball, ostracised subjects' negative mood and anger decreased.

Table 7: Interaction between Inclusionary Status and Measurement Point 2 and 3 of PANAS Positive and Negative Affect as well as Anger

Dependent Variables		Ostracised		Included	
PANAS	Measurement point	*M*	*SE*	*M*	*SE*
positive affect	2	-.397 [a]	.120	.340 [b]	.122
	3	-.053	.142	.071	.144
negative affect	2	.067	.148	-.227 [b]	.147
	3	-.103	.170	.070 [a]	.169
anger	2	.160 [a]	.158	-.305 [b]	.159
	3	-.059	.181	.042	.182

Note: z- standardised variables; significant difference for each measured affect: a, b: p < .050

The results of the inferential statistical analyses revealed a main effect of inclusionary status ($F_{(1,44)}$ =7.52, $p < .050$, $\eta^2 = .15$) with ostracized participants experiencing less positive affect compared to included participants. Negative affect and anger showed no main effect either (both *Fs* < 1.5, both *ps* > .100).

Ostracised participants reported significantly lower levels of positive affect (PANAS positive: Interaction inclusionary status X measurement time: $F_{(1,44)}$ =8.66, $p < 0.010$, $\eta^2 = .164$) as well as higher levels in negative affect and anger (PANAS negative: Interaction inclusionary status X measurement time: $F_{(1,45)} = 4.36$, $p < 0.050$, $\eta^2 = .09$; PANAS anger: (marginal) Interaction inclusionary status X measurement time : $F_{(1,46)} = 3.85$, $p < 0.100$, $\eta^2 = .08$) in comparison to included participants.

As Table 7 depicts, post-hoc tests revealed that ostracised participants experienced lower positive affect and more anger than the included ones only right after the Cyberball (PANAS positive: $p < .010$; PANAS anger: $p < .050$) but not after the TAP. Included participants, however, reported more negative affect after the TAP than after the Cyberball (PANAS negative: $p < .050$). The increase in anger of included participants from the second (after Cyberball) to the third (after TAP) measurement time just failed to reach significance as did the difference between ostracized and included participants in negative affect after the Cyberball.

The manipulation of provocation influenced self-reported mood, too. High provocation also resulted in lower positive affect (Interaction Provocation X measurement time: $F_{(1,44)}$ = 7.68, p < .050, η^2 = .15). Contrary to this, negative mood and anger were not significantly influenced by provocation (Interaction Provocation X measurement time: both *Fs* < 2.03, both p s>.100).

The two TAP versions had a different influenced on self-reported positive mood (Interaction TAP version X measurement time: $F_{(1,44)}$ = 9,71, p < .010, η^2 = .18). The post-hoc tests revealed that participants of the *noise* version reported significantly less positive mood after the TAP than those of the *money* version (p < .010). Negative mood and anger were not significantly influenced by the TAP versions (Interaction TAP version X measurement time: both *Fs* < 1.00, both p s>.100).The three-way interaction between inclusionary status, provocation, and measurement time was significant for PANAS anger ($F_{(1,46)}$ = 4.97, p < .050, η^2 = .10). Post-hoc tests revealed that included, but highly provoked participants reported higher levels of anger after the TAP than before the TAP (p < .050) and than the low provocation group after the TAP (p < .050). Ostracized participants did not differ significantly in their anger after low or high provocation (p > .100).

5.4.2. Mood measured with the post-experimental questionnaire

Figure 11 presents the influence of inclusionary status on self-reported anger about the Cyberball and the TAP, enjoyment playing the Cyberball game or the TAP, and experienced anxiety during these tasks. Descriptively, ostracized participants reported more anger and anxiety concerning the Cyberball game as well as less enjoyment playing this game compared to their included team-mates. Interestingly, this pattern changed when ostracized participants reported about their feelings during the TAP. During this task, ostracized participants experienced less anger and anxiety as well as more enjoyment than those who were included. In contrast to this decrease in negative feelings and increase in positive feelings from one task to the next, included participants reported more anger and anxiety as well as less enjoyment concerning the TAP compared to the Cyberball game. But considering the absolute values of agreement with statements about experienced anger and anxiety during both tasks, it is overall more a disagreement than accordance. The analysis of self-reported anger revealed a main effect of inclusionary status ($F_{(1,48)}$ = 4.64, p < .050, η^2 = .09), provocation ($F_{(1,48)}$ = 11.643, p < .010, η^2 = .20) and TAP version (marginal, $F_{(1,48)}$ = 3.33, p < .100, η^2 = .07). Post-hoc tests revealed higher levels of anger for ostracized participants compared to included ones, for highly provoked participants compared to mildly provoked ones and for participants of the TAP *money* version

compared to those of the TAP *noise* version. Moreover, the analysis revealed a significant interaction between inclusionary status and anger ($F_{(1,48)} = 58.01$, $p < .001$, $\eta^2 = .55$), which supported the descriptive pattern presented in Figure 11. Post-hoc test showed that ostracized participants reported ore anger about the Cyberball game than their included team-mates ($p < .010$), but less anger about the TAP compared to the Cyberball game ($p < .010$).

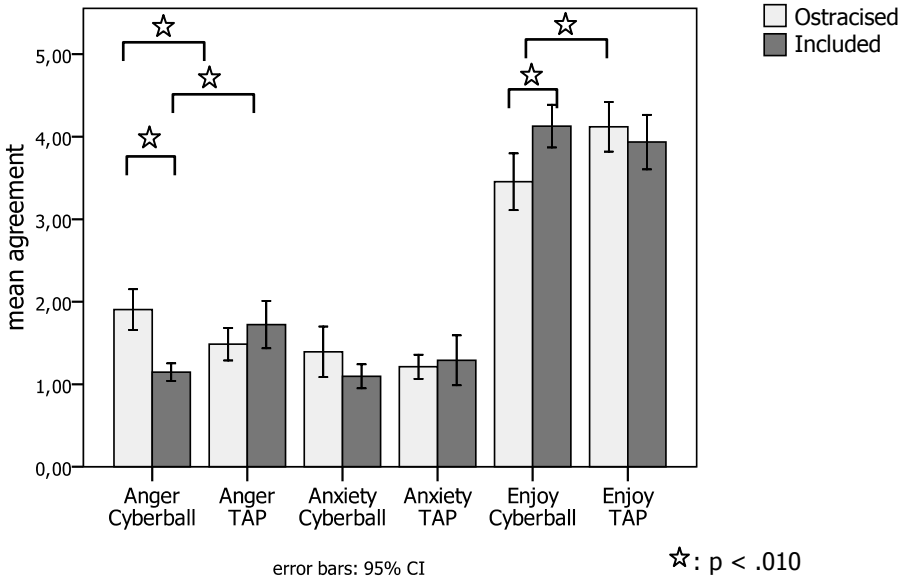

Figure 11: Influence of Inclusionary Status on Self-reported Anger, Anxiety and Enjoyment (Post-experimental Questionnaire)

In contrast, included participants reported more anger about the TAP than about the Cyberball game ($p < .010$). The interaction between provocation and anger was significant, too ($F_{(1,48)} = 17.10$, $p < .001$, $\eta^2 = .26$), indicating that highly provoked participants felt angrier during the TAP compared to the Cyberball game ($p < .010$) and to mildly provoked participants during the TAP. Moreover, the analysis revealed a significant three-way interaction between inclusionary status, provocation, and anger ($F_{(1,48)} = 5.77$, $p < .050$, $\eta^2 = .11$). Post-hoc tests disclosed that ostracized but mildly provoked participants reported more anger during the Cyberball game than during the TAP ($p < .010$), whereas included and highly provoked participants experienced more anger during the TAP than included and mildly provoked participants and compared to the Cyberball game. Additionally, ostracized and highly provoked participants reported more anger during the Cyberball than included and highly provoked participants ($p < .010$), but not during the TAP ($p < .010$). Ostracized and mildly provoked participants reported more anger during the Cyberball than included and mildly provoked participants ($p < .010$), too. The Post-hoc tests of the

significant three-way interaction between TAP version, sex, and anger ($F_{(1,48)}$ = 6.28, p < .050, η² = .12) depicted that male participants reported less anger during the TAP *noise* version than during the TAP *money* version. No further effects were found (all *Fs* < 2.50, *ps* > .100).

The results of the inferential statistical analysis of reported anxiety revealed an interaction between the factors inclusionary status, provocation, and sex each with TAP Version (Interaction: inclusionary status X TAP version: $F_{(1,48)}$ = 6.36, p < .050, η² = .12, Interaction: provocation X TAP version: $F_{(1,48)}$ = 7.76, p < .010, η² = .14, Interaction: sex X TAP version :$F_{(1,48)}$ = 5.09, p < .050, η² = .10). Post-hoc tests disposed that ostracized participants reported significantly more anxiety in general than included ones only in the TAP *money* version, not in the *noise* version. In contrast to this, highly provoked participants reported more anxiety than mildly provoked ones only in the TAP *noise* version. Female participants experienced more anxiety than their male peers in the TAP *noise* version, not in the *money* version. Further main effects or interactions failed to reach significance (all *Fs* < 4.00, all *ps* > .050).

The analysis of enjoyment of the task, either the Cyberball game or the TAP, revealed a main effect of the repeated measurement, indicating that participants enjoyed the TAP more than the Cyberball game ($F_{(1,48)}$ = 4,76, p < .050, η² = .09). Moreover, the enjoyment was influenced by the inclusionary status (Interaction: inclusionary status X enjoyment of the task (repeated measure): $F_{(1,48)}$ = 13.68, p < .001, η² = .22) and the TAP version. (Interaction: TAP version X enjoyment of the task (repeated measure): $F_{(1,48)}$ = 4.40, p < 0.050, η² = .08). Post-hoc tests could show that ostracized participants experienced less enjoyment during the Cyberball game than included ones and compared to playing the TAP (p < .010). Additionally, participants enjoyed more playing the TAP *money* version than the *noise* version and more than playing the Cyberball game (p < .050). The Post hoc test of the three-way interaction between inclusionary status, sex, and enjoyment of the task ($F_{(1,48)}$ = 7.47, p < .010, η² = .14) revealed that female participants who were ostracized enjoyed the TAP more than the Cyberball game (p < .010) and reported less enjoyment during this ball-tossing game than their included female team-mates (p < .050) and than ostracized male participants. This was supported by the significant interaction between inclusionary status and sex ($F_{(1,48)}$ = 4,15, p < .050, η² = .08). Ostracized males reported more enjoyment in both tasks than their ostracized female peers (p < .010), who reported less enjoyment than their included female team-mates, too (p < .010). Further main effects or interactions were not significant (all *Fs* < 3.50, all *ps* > .050).

5.5. Hypothesis IV: Mediation of mood between ostracism and aggressive behaviour

As inclusionary status and aggressive behaviour in the TAP block 1 to 3 were not correlated (r_{Block1} = -.11, p>.050; r_{Block2} = -.03, p> .050; r_{Block3} = .07, p>.050), an analysis of a mediation was not sensible.

5.6. Hypothesis V: Mediation of dispositional factors between ostracism and aggressive behaviour

As inclusionary status and aggressive behaviour in the TAP block 1 to 3 were not correlated (r^2_{Block1} = .01, p >.050; r^2_{Block2} = .00, p > .050; r^2_{Block3} = .00, p >.050), an analysis of a mediation was not in order.

5.7. Explorative analyses of the relationship between dispositional factors and aggressive behaviour in the TAP

Unfortunately the planed mediator analyses were not possible. Nevertheless, the data should not have been collected in vain.

Zardo et al (2004) investigated the influence of social anxiety on ostracism and aggressive behaviour. They found out that social anxiety did not moderate the impact of ostracism on the primary needs, but it did affect the persistence of aversive effects of ostracism. In fact, highly anxious participants recovered from effects of the ostracism experience more slowly than did the non-anxious participants. Thus, it might be possible that other dispositional factors are affected by ostracism and hence influence the exclusion-induced aggressive response. What is the role of personality traits concerning anger and aggression? Does the experience of exclusion enhance or delete the influence of traits?

To address these questions, ostracism was tested for its moderating qualities of the relationship of dispositional factors and aggressive behaviour in the TAP. As noted above, inclusionary status and aggressive behaviour in the TAP were not correlated. Additionally, no correlation between inclusionary status and measured dispositional factors of anger, aggression, or stress were found (see appendix, table 1), except "openness" (measured with the "FAF"). Consequently, this variable was excluded of the analyses.

Correlations between the trait variables and aggressive behaviour in the TAP in consideration of the inclusionary status were calculated and are depicted in the tables 1 - 8 in the appendix. The results revealed a different pattern for ostracized in comparison to included participants (see tables 2 - 5 of the appendix). Whereas most variables measuring dispositional bias concerning anger and aggression correlated with aggressive behaviour in

the TAP of included individuals (e.g.: Block1 X agitation: TAP noise version $r^2 < .27$, $p < .050$; TAP money version $r^2 < .13$, $p < .050$; TAP money version: Block 1 X aggression inhibition: $r^2 < .32$, $p < .050$; Block 2 X aggression inhibition: $r^2 < .26$, $p < .050$; Block 3 X aggression inhibition: $r^2 < .35$, $p < .050$; TAP noise version: Block 1 X self-aggression: $r^2 < .32$, $p < .050$; Block 2 X self-aggression: $r^2 < .21$, $p < .100$; Block 3 X self-aggression: $r^2 < .33$, $p < .050$), nearly no correlations were found for ostracized participants (all $r^2 s_{\text{both versions}} = .09$, $p > .100$; all $r^2 s_{\text{each version}} = .20$, $p > .100$;). In contrast to these finding, correlations with individual differences in reactivity to stress depicted another pattern. Whereas in the group of included participants only dispositional reactivity to stress caused by social evaluation were positive related to each other, more variables were related in the group of ostracized individuals. In this group reactivity in the pre-stress phase, to stress caused by overwork and failure at work were positively related to the aggressive behaviour in the TAP *money* version. High reactivity in the post-stress phase came along with less aggressive behaviour in this version.

In sum, these results indicate that the response to the aversive experience of being ostracized is influenced by dispositional stress characteristics and not by various anger or aggression biases.

6. Discussion

In the present chapter the results, outlined in the previous chapter, will be discussed along the order of the hypotheses.

Ostracism was successfully induced with the help of the Cyberball game. Ostracized participants perceived correctly that they received fewer balls than their team-mates and consequently felt rejected. Thus, the reliable induction of ostracism with the help of this method demonstrated in several studies (e.g.:Warburton et al., 2006; Williams et al., 2000; Williams et al., 2002; Zadro et al., 2004; Zadro & Williams, 2006) could be replicated. Additionally, the induction of provocation was successful, as well. In both versions of the TAP, we found an increase in aggression with increasing levels of provocation replicating previous studies (e.g.: Bertsch et al., 2009; Chermack, Berman, & Taylor, 1997; Taylor, 1967).

However, compared to literature, the effects for these results of provocation (*noise* version: $\eta^2 = .30$; $\omega^2 = 0.16$; *money* version: $\eta^2 = .16$; $\omega^2 = 0.07$) were not as high as expected (Chermack et al., 1997: $\omega^2 = .38$). Usually, mean settings around 7 till 8 are found for the provoked participants in block 3. Figure 4 depicts in fact a tendency towards small settings for the punishment in both versions. Nevertheless, mean settings of participants who were exposed to low provocation were even lower.

Based on this satisfactory manipulation check, the outcomes of the hypotheses are presented in the following.

6.1. Ostracism threaten four fundamental needs

Ostracism is supposed to threaten four fundamental human needs: the need to belong, self-esteem, the need to control, and meaningful existence. In the line with previous studies, (e.g.: Sommer et al., 2001; Twenge et al., 2003; Williams et al., 2000; Williams, 2001; Zadro & Williams, 2006), a low level of all these four needs was reported by ostracized participants. Interestingly, the need to control and the need to belong wee most threatened by the exclusion during the Cyberball game. According to the model of ostracism, developed by Williams (1997, 2005), a threat of relational needs, as the need to belonging, will lead to a relatively prosocial behaviour to fortify these needs. Yet, if the need to control is most threatened, Williams and colleagues (2005) propose a proactive and even aggressive behaviour to re-establish the feelings of efficacy. Consequently two opposite behaviours are possible for ostracized participants.

6.2. Ostracism leads to enhanced aggressive behaviour

6.2.1. TAP

Recently, ostracism was supposed to constitute a possible reason and elicitor of aggressive behaviour. Several studies consistently confirmed this assumption (for a review see Leary et al., 2006). However, the present results do not fully support the hypothesis. Primarily, the version of the Taylor aggression paradigm (TAP) led to different pattern in aggressive behaviour of ostracized individuals. Thus, the type and mode of provocation and aggressive behaviour influenced the reaction of those who were not previously included. Hence, the results of the two different TAP versions are discussed separately.

Noise version

This version corresponded the task used by others as a measurement of aggressive behaviour in the research of ostracism and aggression (e.g.: DeWall, Twenge, Gitter, & Baumeister, 2009; Twenge et al., 2003; Warburton et al., 2006). These studies concentrated on the noise blast settings in the first trial or block of this task as these reactions were regarded as a measure of rejection-induced unprovoked aggression.
The present results show that descriptively ostracized participants exposed their game partners to more painful noises than included participants directly after experiencing ostracism (TAP first trial and block 1). Although this difference did not reach significance, the behavioural pattern supports the results of many studies, which found out that exclusion lead to aggressive behaviour (e.g.: Buckley et al., 2004; DeWall et al., 2009; Twenge et al., 2001; Twenge et al., 2007; Warburton et al., 2006).
However, most real-life interpersonal aggressive encounters are characterized by a reciprocal escalatory interchange of provocations (Taylor & Chermack, 1993) and exclusion and possible reaction happen in a social context, which makes culmination of verbal abuses and retaliation possible. Thus, one aim of the present study was to examine the effects of ostracism in combination with increasing provocation and possible retaliation on aggressive behaviour. The results of TAP block 2 and 3 showed that ostracized participants behaved less aggressively than included participants, irrespective of the provocation they received from their opponents. Considering the amount of provocation to which the participants were exposed, the results revealed that provocation did not influence the behaviour of those who were ostracized in the expected way. Ostracized participants did not respond to their partner's increasing provocation by showing strong retaliations observed in the highly provoked included participants (TAP block 2 and 3). When exposed to very high levels of provocations (TAP block 3), ostracized participants were even less aggressive than included

participants. Thus, the present results indicate that ostracized highly provoked participants do not retaliate against the punishment under likewise increasing provocation.
This could be explained in different ways. According to the model of Williams, this non-aggressive behaviour suggests that ostracized participants tried to fortify their need to belong in the course of the task. However, the low levels of sense of control caused by ostracism would imply likewise a try to regain control. Thus, the assumptions of the model do not clarify which responses were to be expected in this setting.
On one side, participants' behaviour to increasing provocation may reflect learned helplessness. When individuals experience that they could not change the situation and that their action does not matter, they will feel and become helpless, and consequently fail to initiate any action and therefore show reduced aggressive behaviour (Peterson et al., 1993). As reasoned in section two, the experience of ostracism itself might have lead to a form of helplessness. In the present study, ostracized participants' sense of control was first shattered during the Cyberball. At the beginning of the reaction time task (TAP), these participants behaved in the first trial and the following of block 1 aggressively taking the opportunity to retaliate for being ostracized and mildly provoked. They exposed those who ostracized them to more painful noises. This could be interpreted as a try to regain control. However, during the course of the TAP, these ostracized and highly provoked participants might have realized that they were again in an uncontrollably aversive situation, in which their partners exposed them to more and more painful noises no matter how they behaved. This might have resulted in a state of learned helplessness and they may have just awaited the game's ending.
One the other side, non-aggressive behaviour in the TAP can be due to the fact that participants were students in their first year who were playing with their peers. Participants had just began their studies and lived in Trier for approximate two months. Their circle of friends in the new town was most probably not established, yet. We made sure that the participants taking part at the same time were not friends, but most participants explained that they knew each other by sight. Thus, each fellow student whom participants met right before the experiment constituted a probable new friend, promising candidates for friendly social connection, or at least someone who will accompany them during their time at the university. Consequently, participants showed reduced aggressive behaviour not to ruin their chance of a new friendship and an amicable first contact. Several studies found out that socially excluded participants were eager to replenishing connectedness. Gardner et al. (2000) found that people who were excluded subsequently paid more attention to the social aspects of a diary, presumably because exclusion made interpersonal information

more salient to a current need. A recent investigation by DeWall et al. (2009a) found that excluded people typically desire to form new social bonds, as indicated by greater interest in interacting with potential partners, optimistic assessments of others as friendly, and the assignment of positive evaluations to people they expect to meet, although they did not assign positive evaluations to other people with whom no interactions were anticipated. Being torn between on the one side fortifying their need to control by retaliating against the painful provocation and on the other side re-establishing their need to belong by non-aggressive behaviour, ostracized highly provoked participants end up undecided. Their reaction was neither resolutely aggressive nor truly socially desirably. Therefore their response in the first trial and the first block was not aggressive enough to reach statistical significance and they were less aggressive in block 2 and 3 than included participants.

In the low provocation condition, ostracized participants were nearly as aggressive as ostracized highly provoked participants directly after being socially excluded (TAP block 1). The first block of the TAP was identical for all participants, thus, they were exposed to mild provocation. As those participants who were ostracized and in the later course of the TAP (block 2 and 3) gradually highly provoked, these participants (ostracized and later low provoked) took the opportunity to retaliate for being ostracized and mildly provoked in TAP block 1, too. They exposed those who ostracized them to more painful noises, probably to regain control.

However, when the game went on (TAP block 2 and 3) and these participants were only exposed to low provocation, they showed the least aggressive behaviour of all groups. The constantly little provocative behaviour of their partners, which even did not change during the first block when participants behaved aggressively towards their partners, may have been a positive surprise to the ostracized participants. This "nice" and cooperative behaviour might have been seen as an opportunity to re-establish the thwarted need of belonging and prevent these individuals from feeling helpless. The best way to fortify the need of belonging was in showing nice and socially desirable, less aggressive behaviour themselves. Similar to this, previous studies found that socially excluded participants were not aggressive toward individuals who praised them (Twenge et al., 2001) or towards a partner, who initiated and maintained a cooperative stance (Twenge et al., 2007a; Experiment 5).

Additionally, these ostracized and low provoked participants were playing with their peers. Therefore future interactions with the team-mate after the experiment were to be expected. Twenge et al. (2003) found out that rejected individuals were less aggressive towards someone with whom they expected to interact later on in the experiment (for

review see, Twenge, 2005). Consequently, the very low levels of aggressive behaviour could also be caused by the socially important opponents.
Interestingly, the effort to re-establish the need for belonging caused this group of participants to behave even less aggressively than accepted participants. However, the included and low provoked participants had no reason to behave especially friendly and cooperatively, as their social connectedness were not shattered in the course of the experiment.

Money version:

Descriptively, in contrast to the *noise* version, ostracized participants retaliated against the punishment under likewise increasing provocation in this version. Moreover, their aggressive behaviour exceeded the level of the response of included participants. However, the mean level of deduction was very low for all groups. Ostracized and mildly provoked participants showed decreasing aggressive behaviour in block 2 and 3. Thus, it seems, as if the contact with their peers and the low levels of the need to belong and the need to control did not have the same influence on participants' behaviour in this version of the TAP.
Moreover, participants' sex has to be taken into account, as it played a major role with regard to aggressive behavior. Ostracized males subtracted more money from their ostracizing peers' account then included males and ostracized females. However, included females showed more aggressive behavior then included males and female participants were in general more responsive to increasing levels of provocation than male participants. Taken together, ostracism increased aggression in male but not in female participants, which reacted strongly to the increasing levels of provocation.
Williams & Sommer (1997) found sex differences in social behavior after ostracism, too. After a ball-tossing game with two other individuals, participants had to work on an idea-generation task either coactively, in which the individual effort would be evaluated or collectively, in which the group's effort would be assessed. Males socially loafed, i.e., they worked less hard collectively than coactively, whether they had been ostracized or included in the ball-tossing game. However, ostracized females socially compensated, i.e., they worked harder in the collective than in the coactive condition. In line with this, diminished aggression in ostracized women in the present study may be interpreted as an enhanced effort toward a pro-social goal, namely being accepted by the group by showing socially desirable behavior. This finding is parallel to those, found in the *noise* version. To fortify the need to belong, ostracized female did not behave aggressively towards their peers. Thus, in the money version, the present results replicated previously reported exclusion-

induced aggression effects (e.g.: DeWall et al., 2009a; Twenge et al., 2001), however, only for male participants.

Sex differences in regard to the effects of ostracism on aggression have not been reported so far. A plausible reason for this can be seen at least partly in task-related differences. Although the TAP *money* version successfully induced aggression in highly provoked participants, this task may have resembled a gambling task. The received as well as the retaliated punishment was probably not experienced as harmful and injuring as the blast of noises of the *noise* version. In fact, the money subtractions did not cause direct physical harm but a delayed monetary setback. Subtracting some money from the partner's account resulted in gaining less money, but may have made the game more interesting and exciting. Taking into account the structure of this version, a deduction of money, even little amount of money, was harmful for the participants, as well. This finding of increases in aggressive behaviour in ostracized male participants, concurrently harming themselves, is consistent with the results of a series of experiments, accomplished by Twenge et al. (2002). They could show that social exclusion lead to unintentionally self-defeating behaviour. Exclusion was manipulated by telling some people that they were likely to end up alone later in life. Excluded people had a greater preference for choosing the risky long shot in a lottery choice (Experiments 1, 2), a pattern which has been linked to irrational, self-defeating behaviour. Moreover the results for ostracized male participants confirmed the results of Twenge et al. (2007a), although they did not find sex differences, either. Participants played the prisoner's dilemma game (Rapoport, Chammah, & Orwant, 1965), a task in which only prosocial, cooperative behaviour leads to a gain of both players. Socially excluded participants showed antisocial behaviour although it actually cost them money. Based on these explanations, it seems as if in this task version ostracized males showed self-defeating, risky, antisocial behaviour, which was not necessarily intended to really harm their opponent, as the deduced amount of money was low. However, on average, females have been found to be more risk aversive than males in financial decision-making (Byrnes, Miller, & Schafer, 1999). The present results indicate that these sex differences could be modulated by interpersonal devaluation. Thus, being excluded and provoked by peers lead to an effort to fortify the need to belong only in female participants. Thwarted feelings of belonging rather seem to increase risk aversion in females while they may have increased risk taking in males.

6.2.2. Evaluation of the team-mate and future settings in the TAP

Evaluation of the team-mate

Included highly provoked participants liked their team-mates less than included but low provoked participants. Several studies have revealed that excluded participants criticize and devalue those, who rejected them (e.g.: Buckley et al., 2004; Bourgeois & Leary, 2001; Williams et al., 2002; Zadro & Williams, 2006). In contrast to these findings, the present study showed that descriptively ostracized highly provoked participants liked their opponent more than included highly provoked participants. Moreover, ostracized highly provoked participants significantly liked their partners more in the TAP *noise* version compared to the *money* version. This statement is consistent with the decreasing aggressive behaviour in the *noise* version. A sex difference was not found for this statement in the *money* version, which could count as a support for the assumption that this task was played as gambling. Although ostracized males showed risky antisocial behaviour, they did not devaluate their opponents. As mentioned above, DeWall et al. (2009a) found out that excluded people evaluate those people more positively, if they expected to meet them. This pattern confirms the assumption concerning the TAP *noise* version and females of the *money* version that especially ostracized participants tried to re-establish their social connectedness and belonging. Thus, sources of exclusion and provocation are not derogated if these people constitute promising candidates for future important interactions.

Future settings in the TAP

High provocation resulted in higher levels in a future TAP turn playing with the same team-mate again. The reported future settings of participants who were exposed to low provocation were very low in both versions for both scenarios. Warburton et al. (2006), similar to Twenge et al. (2001), found participants aggressing even towards an innocent person, who neither rejected nor insulted the participants, and Buckley et al. (2004) revealed that this aggressive behaviour was not influenced by an anticipated interaction with the source of rejection. The present findings suggest that further interactions with the source of ostracism during the TAP lead to a focus of aggressive behaviour towards the source of ostracism and provocation and away from neutral other persons.
Moreover, the cooperative behaviour experienced by low provoked participants in the TAP reduced uncontrolled aggression against innocent neutral persons as well as against the source of ostracism.

6.3. Ostracism-induced changes in mood

6.3.1. Results of self-reported mood measured with the PANAS

Ostracized participants reported less positive affect as well as more anger and slightly more negative affect following the exclusion. These results confirm the assumption in the model of Williams (1997, revised 2001, 2005), which indicates that ostracized individuals respond to any form of ostracism with hurt feelings and pain. Thus, these results of the present study is in line with several other studies, using the Cyberball game as a manipulation for ostracism, which find emotional distress after ostracism (e.g.: Williams et al., 2000; Williams, 2001; Zadro et al., 2004). However, other studies found that social exclusion lead to feelings of inner numbness, which may reflect a natural coping mechanism which keeps the excluded person from further emotional injuries (Baumeister et al., 2002; Twenge et al., 2001; Twenge et al., 2002; Twenge et al., 2003). Different researchers suggest that these contradicting results could be caused by different exclusion-inducing methods (Baumeister et al., 2007a, Williams, 2007).

Interestingly, ostracized participants' mood recovered in the course of the TAP and did not differ at measurement point 3 from that of included participants, which reported more negative affect after the TAP than before. Additionally, ostracized participants who were highly provoked did not report more impaired mood than low provoked included and ostracized participants. Twenge, Koole, DeWall, Marquez, & Baumeister (2006) measuring non-consciously emotional responses found that excluded people exhibited not distress but, instead enhanced positive emotionality. Thus, these results suggest that ostracized participants tried successfully to cope by reconstituting their emotional status.

6.3.2. Results of self-reported mood measured with the post-experimental questionnaire

At the end of the experiment, all participants reported low levels of anger and anxiety for the Cyberball as well as the TAP and high levels of enjoyment of both tasks. Nevertheless, ostracized and highly provoked participants reported more anger than included and mildly provoked participants, respectively. Supporting the results of the PANAS, ostracized individuals reported more anger about the Cyberball than about the TAP. High provocation did not change this pattern for these participants. Moreover, ostracized participants retrospectively stated that they enjoyed the TAP very much. The difference of the two TAP versions was found in mood as well. Participants of the *noise* version reported less positive mood compared to those of the *money* version. This finding and the fact that participants experienced more enjoyment playing the *money* version, indicates that the deduction of

money was not as distressful as highly unpleasant noises. At the same time, participants, especially males, of the *money* version reported more anger, which could be evoked by risky behaviour and losses involved in the gambling task.
In sum these retrospective statements about anger and enjoyment confirmed the results of the state mood questionnaire. Ostracized individuals use the opportunity to reduce negative and increase positive feelings.
Taking together the results concerning mood indicate that the contact with potential socially important peers, the prospect of re-established need of belonging, and passing of time seem to enable ostracized to reduce negative feelings. Not only did these individuals try to protect themselves from further emotional distress and injuries, but also sought for positive feelings, such as enjoyment.

6.4. Mediation between ostracism and aggressive behaviour by mood and by dispositional Factors

Several studies tried to find mediating factors, interindividual and situational ones, which help explain the variety in responses to social exclusion, rejection, and ostracism, which include aggressive behaviour, prosocial behaviour as well as devaluating team-mates and efforts on collective tasks. However, until now, no dispositional mediators were found, except empathy, control, and trust (both inconsistent results). The needs self-esteem and belongingness, narcissism, mood, and social anxiety did not yield significant results. Unfortunately, our data did not allow for addressing this question. However, the data of the trait questionnaires should not have been collected in vain. Correlations between the behaviour in the TAP and dispositional factors of anger, aggression and stress were calculated considering the inclusionary status, in order to examine if it moderates between this trait and the behaviour in the task. The results are discussed in the following.

6.5. Explorative analyses of the relationship between dispositional factors and aggressive behaviour in the TAP

The results revealed that, as expected, dispositional anger and aggression correlated positively with aggressive behaviour in the TAP under normal conditions, i.e.: within the group of included participants. In contrast, there were nearly no correlations found for ostracized individuals. Only aggression inhibition was negatively correlated with aggressive behaviour in block 2 of both versions. It seems as if an aversive experience like the threat of social connectedness clears individual differences of anger and aggression. However, concerning individual differences in reactivity to stress showed another pattern. Whereas in the group of included participants only dispositional reactivity to stress caused by social

evaluation were positively related to each other, more variables were related in the group of ostracized individuals. In this group reactivity in the pre-stress phase, to stress caused by overwork and failure at work were positively related to the aggressive behaviour in the TAP *money* version. High reactivity in the post-stress phase came along with less deduction of money.

These findings are in the line with recent research, which have dealt with cortisol, a corticosteroid hormone, which is referred to as the "stress hormone", and social exclusion, respectively rejection. For example, Gunnar, Sebanc, Tout, Donzella, & van Dulmen (2003) found higher cortisol levels in children who were rejected by classmates compared to other children. Zwolinski & Jennifer (2008) assessed psychosocial and neuroendocrine stress responses to social exclusion in females Stroud, Salovey, & Epel (2002) found out that women were more physiologically reactive to social rejection challenges, but men reacted more to achievement challenges. However, the actual acute aggressively behaviour, the retaliated punishment with aversive noises, correlated negatively with aggression inhibition within the group of included participants and positively with self-aggression.

In sum these results indicate that the response to the aversive experience of being ostracized is influenced by dispositional stress characteristics and not by various anger or aggression traits concerning unreasonable self-defeating and risky behaviour in gambling. However, the collected trait variables did not explain the aggressive behaviour in the TAP *noise* version under normal or excluded conditions.

Nevertheless, it is important to keep in mind that the sample on which the correlations are based is very small. Thus the results have to be considered with caution and undeniably need further replication.

6.6. Conclusion and outlook

Taken together, the present results indicate that being ostracized by socially significant peers threatens the needs to belong, to control, of meaningful existence, and of self-esteem and leads to a decrease of positive affect and an increase of negative affect. This aversive experience enhances physical aggression directly after the experience of social exclusion. But if ostracized participants were additionally exposed to ongoing and increasing physical provocation, this led to decreasing aggressive behaviour towards peers. Thus, ostracism of socially important connections combined with further contact, even physically aversive one as provocation, increases efforts to replenishing connectedness and seek for more positive affect. The peers, the source of ostracism and provocation, were not devaluated and aggressive attitude diminished towards the source and neutral persons. Moreover, peer ostracism enhanced risk taking behaviour in males causing monetary harm

to the ostracizing peers, but decreased risk taking in females. The present results confirm the importance of an anticipation of future interactions with regard to the effects of ostracism and aggression (Twenge, 2005). They showed the desire of ostracized individuals to form new relationships and the possibility to prevent aggressive behaviour by social contacts. The importance of positive social connections should be considered more carefully in early intervention programs. However, learned helplessness as a further reason for the decrease in aggressive behaviour can not be ruled out. Moreover, as ostracism led to an increase in aggression first, its capacity to elicit aggression should not be underestimated.

Further research on this topic is definitely needed. The confounded variable provocation and the uncontrolled effect of peers as source of ostracism and opponents of the TAP have to be investigated under controlled conditions, as it is important to clarify if peers or learned helplessness is responsible for the less antisocial behaviour. Moreover, the differences of the two TAP versions require further investigation. It should be examined, why participants actually experienced the money version as a gambling situation and as less harmful and less aversive than the noise version. Additionally, the sex difference in this case needs further clarification.

Nevertheless, the present study revealed interesting results and is fruitful in terms of suggestions for future studies and research.

Reference List

Abraham, M. (2003). Can a boost to belonging buffer the immediate painful effects of ostrascism? More evidence for no moderation. Unpublished honors thesis. Macquarie University, Sydney, Australia.

Anderson, C. A., Lindsay, J. J., & Bushman, B. J. (1999). Research in the psychological laboratory: truth or triviality? *Current Directions in Psychological Science, 8*, 3–9.

Annual review of psychology (2002).

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York: Freemann.

Baron, R. A., & Richardson, D. R. (1994). *Human aggression* (2. ed.). *Perspectives in social psychology.* New York, NY: Plenum Press.

Baumeister, R. F. (1994). *Self-esteem.* San Diego: CA: Academic Press.

Baumeister, R. F., Brewer, L. E., Tice, D. M., & Leary, M. R. (2007a). Thwarting the Need to Belong: Understanding the Interpersonal and Inner Effects of Social Exclusion. *Social and Personality Psychology Compass, 1*(1), 506–520.

Baumeister, R. F., DeWall, C. N., Ciarocco, N. J., & Twenge, J. M. (2005). Social Exclusion Impairs Self-Regulation. *Journal of Personality and Social Psychology, 88*(4), 589–604.

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117*(3), 497–529.

Baumeister, R. F., & Tice, D. M. (1990). Anxiety and social exclusion. *Journal of Social and Clinical Psychology, 9*, 165–195.

Baumeister, R. F., Twenge, J. M., & Nuss, C. K. (2002). Effects of Social Exclusio on Cognitive Processes: Anticipated Aloneness Reduces Intelligent Thought. *Journal of Personality and Social Psychology, 83*(4), 817–827.

Baumeister, R. F. (Ed.) (1986). *Public self and private self. Springer series in social psychology.* New York: Springer.

Baumeister, R. F. (1990). Suicide as escape from the self. *Psychological Review, 97*, 90–113.

Baumeister, R. F., Vohs, K. D., DeWall, C. N., & Zhang, L. (2007). How emotion shapes behavior: Feedback, anticipation, and refelction, rather than direct causation. *Personality and social Psychology Review, 11*, 167–203.

Berkowitz, L. (1964). Aggressive cues in aggressive behavior and hostility catharsis. *Psychological Review, 71*, 104–122.

Bernstein, S., Richardson, D., & Hammock, G. (1987). Convergent and discriminant validity of the Taylor and Buss measures of physical aggression. *Aggressive Behavior, 13*, 15–24.

Bertsch, K., Böhnke, R., Kruk, M. R., & Naumann, E. (2009). Influence of aggression on information processing in the emotional Stroop task – an event-related potential study. *Frontiers in Behavioral Neuroscience, 3*(28). Retrieved November 22, 2009, from doi: 10.3389/neuro.08.028.2009.

Bierhoff, H. W. (2000). Skala der sozialen Verantwortung nach Berkowitz und Daniels: Entwicklung und Validierung. *Diagnostica, 46*(1), 18–28, from doi:10.1026//0012-1924.46.1.18.

Blaine, B., & Crocker, J. (1993). *Self-esteem and self-serving biases in reactions to positive and negative events: A integrative review.* (Self-esteem: The puzzle of low self-regard). New York: Plenum, pp. 55–85.

Bourgeois, K. S., & Leary, M. R. (2001). Coping with rejection: Derogating those who choose us last. *Motivation and Emotion, 25*, 101–111.

Buckley, K. E., Winkel, R. E., & Leary, M. R. (2004). Reactions to acceptance and rejection: Effects of level and sequence of relational evaluation. *Journal of Experimental Social Psychology, 40*(1), 14–28. Retrieved January 10, 2010, from doi:10.1016/S0022-1031(03)00064-7.

Bushmann, B. J. (1995). Moderating role of trait aggressiveness in the effects of violent media on aggression. *Journal of Personality and Social Psychology, 69*, 950–960.

Bushmann, B. J., & Baumeister, R. F. (1998). Threatened Egotism, Narcissism, Self-Esteem, and Direct and Displaced Aggression: Does Self-Love or Self-Hate Lead to Violence? *Journal of Personality and Social Psychology, 75*(1), 219–229. Retrieved November 21, 2009.

Buss, D. M. (1990). The evolution of anxiety and social exclusion. *Journal of Social and Clinical Psychology, 9*, 196–201.

Byrnes, J. P., Miller, D. C., & Schafer, W. D. (1999). Gender differences in risk taking: A meta-analysis. *Psychological Bulletin, 125*(3), 367–383.

Chermack, S. T., Berman, M., & Taylor, S. P. (1997). Effects of provocation on emotions and aggression in males. *Aggressive Behavior, 23*, 1–10.

Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin, 98*, 310–357.

Crocker, J., Thompson, L., McGraw, K., & Ingerman, C. (1987). Downward comparison, prejudice, and evaluations of others: Effects of self-esteem and threat. *Journal of Personality and Social Psychology, 52*, 907–916.

Dalbert, C., Montada, L., & Schmitt, M. (1987). Glaube an eine gerechte Welt als Motiv: Validierungskorrelate zweier Skalen. *Psychologische Beiträge, 29*, 596–615.

DeWall, C. N., Baumeister, R. F., & Vohs, K. D. (2004). *Recovering from rejection: Undoing the self-regulation deficits stemming from social exclusion.: Unpublished manuscript*. Florida State Universit.

DeWall, C. N., Maner, J. K., & Rouby, D. A. (2009a). Social Exclusion and Early-Stage Interpersonal Perception: Selective Attention to Signs of Acceptance. *Journal of Personality and Social Psychology, 96*(4), 729–741.

DeWall, C. N., Twenge, J. M., Gitter, S. A., & Baumeister, R. F. (2009). It's the thought that counts: the role of hostile cognition in shaping aggressive responses to social exclusion. *Journal of Personality and Social Psychology, 96*, 45–59.

Faulkner, S. J., Williams, K. D., Sherman, B., & Williams, E. (1997). *The "silent treatment": Its incidence and impact*. Presented at 69th Annu. Meet. Midwest. Psychol. Assoc.,. Chicago.

Gardner, W. L., Pickett, C. L., & Brewer, M. B. (2000). Social exclusion and selective memory: how the need to belong influences memory for social events. *Personality and Social Psychology Bulletin, 26*, 486–496.

Geller, D. M., Goodstein, L., Silver, M., & Sternberg W.C. (1974). On being ignored: the effects of violation of implicit rules of social interaction. *Sociometry, 37*, 541–556.

Giancola, P. R., & Chermack, S. T. (1998). Construct validity of laboratory aggression paradigms: a response to Tedeschi and Quigley. *Aggression and Violent Behavior, 3*, 237–253.

Giancola, P. R., & Zeichner, A. (1995). Construct validity of a competitive reaction-time aggression paradigm. *Aggressive Behavior, 21*, 199–204.

Gollwitzer, M. S. K. &. P. C. (2006). *Relationalitäts-Kontextabhängigkeits-Skala (RKS): Entwicklung und erste Ansätze zur Validierung*. Berichte aus der Arbeitsgruppe „Verantwortung, Gerechtigkeit, Moral“ Nr. 161, from Trier: Universität Trier, Fachbereich I − Psychologie.: .

Gonsalkorale, K., & Williams, K. D. (2006). The KKK won't let me play: ostracism even by a despised outgroup hurts. *European Journal of Social Psychology, 37*(6), 1176–1186.

Greenberg, J., Pyszczynski, T., & Solomon, S. (1986). The causes and consequences of a need for self-esteem: a terror management theory. In R. F. Baumeister (Ed.), *Public self and private self.* (pp. 189–212).

Greenberg, J., Solomon, S., Pyszczynski, T., Rosenblatt, A., Burling, J., Lyon, D., et al. (1992). Why do people need self-esteem? Converging evidence that self-esteem serves an anxiety-buffering function. *Journal of Personality and Social Psychology, 63*(6), 913–922.

Gunnar, M. R., Sebanc, A. M., Tout, K., Donzella, B., & van Dulmen, M. M. H. (2003). Peer rejection, temperament, and cortisol activity in preschoolers. *Developmental Psychobiology, 43*(4), 346–368.

Hammock, G., & Richardson, D. R. (1992). Aggression as one response to conflict. *Journal of Applied Social Psychology, 22*, 298–311.

Hammock, G., & Richardson, D. R. (1992). Predictors of aggressive behavior. *Aggressive Behavior, 18*, 219–229.

Hampel, R. &. S. H. (1998). *FAF - Fragebogen zur Erfassung von Aggressivitätsfaktoren. Handanweisung.* Göttingen: Hogrefe.

Huynh, H., & Feldt, L. S. (1976). Estimation of the box correction for degrees of freedom from sample data in randomized block and split-plot designs. *Journal of Educational and Behavioral Statistics, 1*(1), 69–82, from DOI: 10.3102/107699860010010.

James, W. (1890). *The principles of psychology.* New York: Cosimo Classics.

Kiecolt-Glaser, J. K., Garner, W., Speicher, C., Penn, G. M., Holliday, J., & Glaser, R. (1984). Psychosocial modifiers of immunocompetence in medical students. *Psychosomatic Medicine, 46*(1), 7–14.

Kiecolt-Glaser, J. K., McGuire, L., Robles, T. F., & Glaser, R. (2002). Emotions, morbidity, and mortality: New perspectives from psychoneuroimmunology. In *Annual review of psychology* (pp. 83–107).

Kirkpatrick, L. A., Waugh, C. E., Valencia, A., & Webster, G. D. (2002). The Functional Domain Specificity of Self-Esteem and the Differential Prediction of Aggression. *Journal of Personality and Social Psychology, 82*(5), 756–767. Retrieved December 31, 2009.

Kowalski, R. M. (Ed.) (1997). *Aversive interpersonal behaviors. The Plenum series in social/clinical psychology.* New York, NY: Plenum Press.

Krohne, H. W., Egloff, B., Kohlmann, C.-W., & Tausch, A. (1996). Investigations with a German version of the Positive and Negative Affect Schedule (PANAS). *Diagnostica, Vol 42*(2), 139–156, from http://psycnet.apa.org/?fa=main.doiLanding&uid=1996-05083-003.

Laux, L. G. P. S. P. S. C. D. (1981). *Das State-Trait-Angstinventar, STAI-T.* Göttingen: Beltz Test GmbH.

Leary, M. R. (1990). Responses to social exclusion: Social anxiety, jealousy, loneliness, depression, and low self-esteem. *Journal of Social and Clinical Psychology, 9*, 221–229.

Leary, M. R. (2001). Toward a conecptualization of interpersonal rejection. In M. R. Leary (Ed.), *Interpersonal rejection.* (pp. 3–20). Oxford: Oxford Univ. Press.

Leary, M. R. (2005). Varieties of interpersonal rejection. In K. D. Williams, J. P. Forgas, & W. von Hippel (Eds.), *The social outcast Ostracism, social exclusion, rejection, and bullying. [The Sydney Symposium of Social Psychology, Volume 7]* (pp. 35–51). New York: Psychology Press.

Leary, M. R., Kowalski, R. M., Smith, L., & Phillips, S. (2003). Teasing, rejection, and violence: Case studies of the school shootings. *Aggressive Behavior, 29*, 202–214.

Leary, M. R., Terdal, S. K., & Downs, D. L. (1995). Self-Esteem as an Interpersonal Monitor: The Sociometer Hypothesis. *Journal of Personality and Social Psychology, 68*(3), 518–530.

Leary, M. R., Twenge, J. M., & Quinlivan, E. (2006). Interpersonal Rejection as a Deterimant of Anger and Aggression. *Personality and social Psychology Review, 10*(2), 111–132.

Leary, M. R. (Ed.) (2001). *Interpersonal rejection.* Oxford: Oxford Univ. Press.

Lieberman, J. D., Solomon, S., & McGregor, H. A. (1999). A Hot New Way to Measure Aggression: Hot Sauce Allocation. *Aggressive Behavior, 25*, 331–348. Retrieved December 31, 2009.

Makepeace, J. (1989). Dating, living together, and courtship violence. In M. A. Pirog-Good (Ed.), *Violence in dating relationships. Emerging social issues.* (pp. 94–107). New York: Praeger.

Maner, J. K., DeWall, C. N., Baumeister, R. F., & Schaller, M. (2007). Does Social Exclusion Motivate Interpersonal Reconnection? Resolving the “Porcupine Problem”. *Journal of Personality and Social Psychology, 92*(1), 42–55. Retrieved February 04, 2010.

Maslow, A. H. (1943). A Theory of Human Motivation. *Psychological Review, 50*, 370–396.

Matsumoto, D., & Ekman, P. (1988). *Japanese and Caucasian Facial Expressions of Emotion and Neutral Faces (JACFEE and JACNeuF) Human Interaction,* from Laboratory University of California San Francisco 401 Parnassus Avenue San Francisco CA 94143: .

McAdams, D. P., & Bryant, F. B. (1987). Intimacy motivation and subjective mental health in a nationwide sample. *Journal of Personality, 55*, 395–413.

Necomb, A. F., Bukowski, W. M., & Pattee, L. (1993). Children's peer realtions: A meta-analytic review of popular, rejected, neglected, controversial, and average sociometric status. *Psychological Bulletin, 113*, 99–128.

Nezlek, J. B., Kowalski, R. M., Leary, M. R., Blevins, T., & Holgate, S. (1997). Personality moderators of reactions to interpersonal rejection: depression and trait self-esteem. *Personality and Social Psychology Bulletin, 23*, 1235–1244. Retrieved January 05, 2010.

Peterson, C., Maier, S. F., & Seligman, M. E. P. (1993). *Learned helplessness: a theory for the age of personal control.* (Vol. 1993). New York: Oxford Univ. Press.

Pickett, C. L., Gardner, W. L., & Knowles, M. (2004). Getting a cue: the need to belong and enhanced sensitivity to social cues. *Personality and Social Psychology Bulletin, 30*, 1095–1107.

Pirog-Good, M. A. (Ed.) (1989). *Violence in dating relationships: Emerging social issues.* New York: Praeger.

Rapoport, A., Chammah, A. M., & Orwant, C. J. (1965). *Prisoner's dilemma: A study in conflict and cooperation* (2. print.). *Ann Arbor paperbacks: Vol. 165.* Ann Arbor, Mich.: Univ. of Michigan Press.

Rothbaum, F., Weiz, J. R., & Snyder, S. (1982). Changing the world and changing the self: A two-process model of perceived control. *Journal of Personality and Social Psychology, 42*(1), 5–37.

Sampson, R. J., & Laub, J. H. (1990). Crime and deviance over the life course: The salience of adult social bonds. *American Sociological Review, 55*, 609–627.

Sampson, R. J., & Laub, J. H. (1993). *Crime in the making: Pathways and turning oints through life.* Cambridge: MA: Havard University Press.

Schmitt, M. G. M. M. J. &. A. D. (2005). Justice Sensitivity: Assessment and Location in the Personality Space. *European Journal of Psychological Assessment, 21*(3), 202–211. Retrieved November 08, 2009, from http://ub-han.uni-trier.de/han/EZB/graphics.tx.ovid.com/ovftpdfs/FPDDNCDCDGLMNA00/fs047/ovft/live/gv024/00012303/00012303-200521030-00008.pdf.

Schmitt, M. M. J. &. S. A. (1995). *Gerechtigkeit als innerdeutsches Problem: Einstellungen zu Verteilungsprinzipien, Ungerechtigkeitssensibilität und Glaube an eine gerechte Welt als Kovariate*. Berichte aus der Arbeitsgruppe "Verantwortung, Gerechtigkeit, Moral" Nr. 82, from Universität Trier, Fachbereich I - Psychologie: .

Schmitt, M. M. J. &. S. A. (1997). *Gerechtigkeit als innerdeutsches Problem: Analyse der Messeigenschaften von Messinstrumenten für Einstellungen zu Verteilungsprinzipien, Ungerechtigkeitssensibilität und Glaube an eine gerechte Welt*. Berichte aus der Arbeitsgruppe "Verantwortung, Gerechtigkeit, Moral" Nr. 105, from Universität Trier, Fachbereich I - Psychologie: .

Schulz, P., Jansen Lars J., & Schlotz Wolff (2005). Stressreaktivität: Theoretisches Konzept und Messung. *Diagnostica, 51*(3), 124–133. Retrieved November 08, 2009.

Schuster, B. (2001). *Rejection and victimization by peers: Social perception and social behavior mechanisms.* New York: Guilford Press, pp. 290-209, from Peer harassement in school: The plight of the vulnerable and victimized: .

Schwenkmezger, P. H. V. &. S. C. D. (1992). *State-Trait Anger Expression Inventory (STAXI).* Bern: Huber.

Smith, A., & Williams, K. D. (2004). R U there? Effects of ostracism by cell phone messages. *Group Dynamics: Theory, Research, and Practice, 8*, 291–301.

Snapp, C. M., & Leary, M. R. (2001). Hurt feelings among new acquaintances: Moderating effects of interpersonal familiarity. *Journal of Social and Personal Relationships, 18*(3), 315–326. Retrieved January 12, 2010.

Solomon, Z., Waysmann, M., & Mikulincer, M. (1990). Family functioning, percieved social support, and combat-related psychopathology: The moderating role of loneliness. *Journal of Social and Clinical Psychology, 9*, 56–472.

Sommer, K.L., Williams, K. D., Ciarocco, N. J., & Baumeister, R. F. (2001). When silence speaks louder than words: explorations into interpersonal and intrapsychic consequences of social ostracsim. *Basic and Applied Social Psychology, 83*, 606–615.

Steele, C. M. (1988). *The psychology of self-affirmation: Sustaining the integrity of the self.* San Diego: Academic Press.

Stroud, L. R., Salovey, P., & Epel, E. S. (2002). Sex differences in stress responses: social rejection versus achievement stress. *Biological Psychiatry, 52*(4), 318–327.

Stuckless, N. &. G. R. (1992). The vengeance scale: Development of a measure of attitudes toward revenge. *Journal of Social Behavior and Personality, 7*, 25–42. Retrieved November 08, 2009, from http://pao.chadwyck.co.uk/PDF/1257703806351.pdf.

Taylor, S., & Chermack, S. T. (1993). Alcohol, drugs, and human physical aggression. *Journal of Studies on Alcohol, Suppl. 11*, 78–88.

Taylor, S. P. (1967). Aggressive behavior and physiological arousal as a function of provocation and the tendency to inhibit aggression. *Journal of Personality, 35*(2), 297–310. Retrieved November 22, 2009, from doi:10.1111/j.1467-6494.1967.tb01430.x.

Tice, D. M., Bratslavsky, E., & Baumeister, R. F. (2001). Emotional Distress Regulation Takes Precedence Over Impulse Control: If You Feel Bad, Do It! *Journal of Personality and Social Psychology, 80*(1), 53–67. Retrieved January 12, 2010.

Twenge, J. M. (2005). When does social rejection lead to aggression?: The influence of situations, narcissism, emotion, and replenshing connections. In K. D. Williams, J. P. Forgas, & W. von Hippel (Eds.), *The social outcast Ostracism, social exclusion, rejection, and bullying. [The Sydney Symposium of Social Psychology, Volume 7]* (pp. 201–212). New York: Psychology Press.

Twenge, J. M., Baumeister, R. F., DeWall, C. N., Ciarocco, N. J., & Bartels, J. M. (2007a). Social Exclusion Decreases Prosocial Behavior. *Journal of Personality and Social Psychology, 92*(1), 56–66.

Twenge, J. M., Baumeister, R. F., Tice, D. M., & Stucke, T. S. (2001). If You Can't Join them, Beat Them: Effects of Social Exclusion on Aggressive Behavior. *Journal of Personality and Social Psychology, 81*(6), 1058–1069. Retrieved November 22, 2009, from DOI: 10.1037//M)22-3514.8I .6.1058.

Twenge, J. M., Catanese, K. R., & Baumeister, R. F. (2002). Social Exclusion causes Self Defeating Behavior. *Journal of Personality and Social Psychology, 83*(3), 606–615.

Twenge, J. M., Catanese, K. R., & Baumeister, R. F. (2003). Social Exclusion and the Deconstructed State: Time Perception, Meaninglessness, Lethargy, Lack of Emotion, and Self-Awareness. *Journal of Personality and Social Psychology, 85*(3), 409–423, from DOI: 10.1037/0022-3514.85.3.409.

Twenge, J. M., Koole, S. L., DeWall, C. N., Marquez, A., & Baumeister, R. F. (2006). Emotion regulation after social exclusion: Automatic tuning toward positive information.

Twenge, J. M., Zhang, L., Catanese, K. R., Dolan-Pascoe, B., Lyche, L. F., & Baumeister, R. F. (2007). Replenishing connectedness: Reminders of social activity reduce aggression after social exclusion. *British Journal of Social Psychology, 46*, 205–224. Retrieved November 22, 2009.

van Beest, I., & Williams, K. D. (2006). *Cyberbomb: Is it painful to be ostracized from Russian roulette?* Work. Pap., Dep. Psychol., Leiden Univ.

van Beest, I., & Williams, K. D. (2006). When inclusion costs and ostracism pays, ostracism still hurts. *Journal of Personality and Social Psychology, 91*(5), 918–928.

van Honk, J., Tuiten, A., Haan, E. de, van den Hout, M., & Stam, H. (2001). Attentional bias for angry faces: relationships to trait anger and anxiety. *Cognition and Emotion, 15*, 279–297.

van Honk, J., Tuiten, A., van den Hout, M., Putman, P., Haan, E. de, & Stam, H. (2001). Selective attention to unmasked and masked threatening words: relationships to trait anger and anxiety. *Personality and Individual Differences, 30*, 711–720.

Warburton, W. A., Williams, K. D., & Cairns, D. R. (2006). When ostracism leads to aggression: The moderating effects of control deprivation. *Journal of Experimental Social Psychology, 42*, 213–220. Retrieved December 20, 2009.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scale. *Journal of Personality and Social Psychology, 54*, 1063–1070.

Williams, K. D., Cheung, C. K. T., & Choi, W. (2000). Cyberostracism: Effects of Being Ignored Over the Internet. *Journal of Personality and Social Psychology, 79*(5), 748–762. Retrieved January 05, 2010.

Williams, K. D., & Fitness, J. (2004). *Social and physical pain: similarities and differences.* Presented at Soc.Exp.Social.Psychology, Ft.Worth, TX.

Williams, K. D., Forgas, J. P., Hippel, W. von, & Zadro, L. (2005). The Social Outcast: An Overview. In K. D. Williams, J. P. Forgas, & W. von Hippel (Eds.), *The social outcast Ostracism, social exclusion, rejection, and bullying. [The Sydney Symposium of Social Psychology, Volume 7]*. New York: Psychology Press.

Williams, K. D., Govan, C. L., Croker, V., Tynan, D., Cruickshank, M., & Lam, A. (2002). Investigations into differences between social- and Cyberostracism. *Group Dynamics: Theory, Research, and Practice, 6*, 65–77.

Williams, K. D., & Zardo, L. (2005). Ostracism: The Indiscriminate Early Detection System. In K. D. Williams, J. P. Forgas, & W. von Hippel (Eds.), *The social outcast Ostracism, social exclusion, rejection, and bullying. [The Sydney Symposium of Social Psychology, Volume 7]* (pp. 19–34). New York: Psychology Press.

Williams, K. D. (1997). Social Ostracism. In R. M. Kowalski (Ed.), *Aversive Interpersonal Behaviour* (pp. 133–170).

Williams, K. D. (2001). *Ostracism: The power of silence. Emotions and social behavior.* New York, London: Guilford.

Williams, K. D. (2007). Ostracism. *Annual Review of Psychology, 58*, 425–452. Retrieved December 23, 2009.

Williams, K. D., Forgas, J. P., & Hippel, W. von (Eds.) (2005). *The social outcast Ostracism, social exclusion, rejection, and bullying*. [The Sydney Symposium of Social Psychology, Volume 7]. New York: Psychology Press.

Williams, K. D., & Jarvis, B. (2006). Cyberball: A program for use in research on interpersonal ostracism and acceptance. *Behavior Research Methods, 38*(1), 174–180. Retrieved November 08, 2009.

Williams, K. D., & Sommer, K. L. (1997). Social Ostracism by Coworkers: Does Rejection Lead to Loafing or Compensation? *Personality and Social Psychology Bulletin, 23*, 693–706. Retrieved December 20, 2009.

Zadro, L., & Williams, K. D. (2006). How long does it last? The persistence of the effects of ostracism in the socially anxious. *Journal of Experimental Social Psychology, 42*, 692–697.

Zadro, L., Williams, K. D., & Richardson R. (2004). How low can you go? Ostracism by a computer lowers mood, belonging, control, self-esteem, and meaningful existence. *Journal of Experimental Social Psychology, 40*, 560–567.

Zwolinski, & Jennifer (2008). Biopsychosocial responses to social rejection in targets of relational aggression. *Biological Psychology, 79*, 260–267. Retrieved February 13, 2010, from doi:10.1016/j.biopsycho.2008.06.006.

Appendix:

Table 1: Correlation of Inclusionary Status with Trait Variables of Anger, Aggression and Stress

		Z- faf 1 spontaneous Aggressio	Z-faf_2 reactive Aggression	Z-faf_2 reactive Aggression	Z-faf_3 agitation	Z-faf_4 Self-aggression	Z-faf_5 Aggression-inhibition	-faf_ Summe Aggr1_2_3
Inclusionary status	Correlation after Pearson	,011	,018	,027	,147	,032	,274*	,023
	Significance (2-sided)	,933	,886	,829	,241	,798	,027	,854
	N	65	65	65	65	65	65	65

		Anger in general	staxi1_ Anger In	Staxi2_ Anger out	staxi3_ Anger Contro	staxi_ mean
Inclusionary status	Correlation after Pearson	-,150	-,044	-,096	-,015	-,096
	Significance (2-sided)	,240	,728	,449	,904	,446
	N	63	65	65	65	65

		Mean responsibility	Mean revenge
Inclusionary status	Correlation after Pearson	-,144	-,092
	Significance (2-sided)	,252	,465
	N	65	65

	reactivity to stress caused by/ in	overwork	Social conflicts	Social evaluation	Failure at work	Pre-Stress-Phase	Post-Stress-Phase
Inclusionary status	Correlation after Pearson	,083	-,027	-,037	-,097	-,041	,034
	Significance (2-sided)	,511	,829	,772	,440	,746	,788
	N	65	65	65	65	65	65

Note: yellow: $p < .050$; blue: $p < .100$

Table 2: Correlation between Aggressive Behaviour in the TAP and Dispositional Aggression Traits (Measured with "FAF"); Ostracized Participants

Ostracized		Z- TAP noise Block 1	Z- TAP noise Block 2	Z- TAP noise Block 3	Z- TAP money Block 1	Z- TAP money Block 2	Z- TAP money Block 3	Z_both versions block 1	Z_both versions block 2	Z both versions block 3	Z-TAP_ money block 1 trial 1	Z-TAP_ noise block 1 trial 1	Z-TAP_ both versions block 1 trial 1l
Z-faf_1 spontaneous Aggression	Correlation after Pearson	-,115	-,095	,004	-,378	-,264	-,017	-,210	-,189	-,031	,043	-,002	,021
	Significance (2-sided)	,660	,717	,988	,149	,322	,949	,240	,292	,863	,874	,993	,909
	N	17	17	17	16	16	16	33	33	33	16	17	33
Z-faf_2 reactive Aggression	Correlation after Pearson	,016	-,100	,032	-,342	-,430	-,280	-,092	-,248	-,156	-,120	,094	-,015
	Significance (2-sided)	,951	,703	,903	,195	,096	,294	,610	,164	,385	,659	,721	,935
	N	17	17	17	16	16	16	33	33	33	16	17	33
Z-faf_3 agitation	Correlation after Pearson	-,003	-,009	,083	-,304	-,440	-,280	-,121	-,210	-,129	,033	,006	,019
	Significance (2-sided)	,989	,972	,751	,252	,088	,294	,504	,241	,473	,904	,982	,917
	N	17	17	17	16	16	16	33	33	33	16	17	33
Z-faf_4 Self-aggression	Correlation after Pearson	,109	-,063	-,091	-,174	,163	,223	,012	,028	,052	-,012	,006	-,015
	Significance (2-sided)	,678	,809	,727	,518	,545	,406	,948	,879	,773	,965	,983	,935
	N	17	17	17	16	16	16	33	33	33	16	17	33
Z-faf_5 Aggression-inhibition	Correlation after Pearson	-,453	-,320	-,387	,047	-,391	-,204	-,177	-,356*	-,304	-,101	-,315	-,194
	Significance (2-sided)	,068	,211	,125	,862	,135	,449	,325	,042	,086	,710	,219	,279
	N	17	17	17	16	16	16	33	33	33	16	17	33
Z-faf_ Summe Aggr1_2_3	Correlation after Pearson	-,037	-,076	,047	-,390	-,415	-,196	-,166	-,244	-,115	-,003	,037	,011
	Significance (2-sided)	,886	,772	,859	,135	,110	,468	,356	,172	,523	,991	,889	,952
	N	17	17	17	16	16	16	33	33	33	16	17	33

Note: yellow: $p < .050$; blue: $p < .100$

Table 3: Correlation between Aggressive Behaviour in the TAP and Dispositional Aggression Traits (Measured with "FAF"); Included Participants

Included		Z- TAP noise Block 1	Z- TAP noise Block 2	Z- TAP noise Block 3	Z- TAP money Block 1	Z- TAP money Block 2	Z- TAP money Block 3	Z_both versions block 1	Z_both versions block 2	Z both versions block 3	Z-TAP_ money block 1 trial 1	Z-TAP_ noise block 1 trial 1	Z-TAP_ both versions block 1 trial 1l
Z-faf_1 spontaneous Aggression	Correlation after Pearson	-,118	-,214	,151	,019	-,099	-,166	-,035	-,142	,028	,032	-,091	-,030
	Significance (2-sided)	,663	,425	,576	,945	,716	,540	,848	,437	,879	,908	,738	,871
	N	16	16	16	16	16	16	32	32	32	16	16	32
Z-faf_2 reactive Aggression	Correlation after Pearson	,053	,144	,231	,112	,114	,008	,047	,117	,111	-,131	,016	-,049
	Significance (2-sided)	,845	,596	,390	,680	,673	,977	,798	,524	,545	,629	,952	,792
	N	16	16	16	16	16	16	32	32	32	16	16	32
Z-faf_3 agitation	Correlation after Pearson	,523*	,281	,015	,021	,168	,001	,365*	,224	,012	-,246	,517*	,270
	Significance (2-sided)	,038	,292	,957	,939	,534	,997	,040	,219	,946	,359	,040	,135
	N	16	16	16	16	16	16	32	32	32	16	16	32
Z-faf_4 Self-aggression	Correlation after Pearson	,561*	,456	,574*	,235	,159	,260	,423*	,300	,431*	,216	,326	,279
	Significance (2-sided)	,024	,076	,020	,381	,557	,330	,016	,096	,014	,421	,218	,123
	N	16	16	16	16	16	16	32	32	32	16	16	32
Z-faf_5 Aggression-inhibition	Correlation after Pearson	,251	,406	,363	-,568*	-,512*	-,595*	-,134	-,111	-,125	-,439	,099	-,147
	Significance (2-sided)	,349	,119	,167	,022	,043	,015	,464	,544	,495	,089	,716	,421
	N	16	16	16	16	16	16	32	32	32	16	16	32
Z-faf_ Summe Aggr1_2_3	Correlation after Pearson	,296	,131	,171	,061	,069	-,082	,207	,100	,065	-,146	,291	,119
	Significance (2-sided)	,265	,628	,526	,823	,799	,763	,255	,586	,724	,590	,274	,517
	N	16	16	16	16	16	16	32	32	32	16	16	32

Note: yellow: $p < .050$; blue: $p < .100$

Table 8: Correlation between Aggressive Behaviour in the TAP and Dispositional Aggression Traits (Measured with "STAXI"); Ostracized Pparticipants

Ostracized		Z- TAP noise Block 1	Z- TAP noise Block 2	Z- TAP noise Block 3	Z- TAP money Block 1	Z- TAP money Block 2	Z- TAP money Block 3	Z_both versions block 1	Z_both versions block 2	Z both versions block 3	Z-TAP_ money block 1 trial 1	Z-TAP_ noise block 1 trial 1	Z-TAP_ both versions block 1 trial 1l
Anger in general	Correlation after Pearson	-,026	,084	,007	,419	,407	,284	,145	,245	,190	-,023	-,026	-,018
	Significance (2-sided)	,922	,748	,980	,120	,132	,305	,429	,176	,299	,935	,921	,924
	N	17	17	17	15	15	15	32	32	32	15	17	32
staxi1_ Anger In	Correlation after Pearson	-,158	,206	,235	,321	,334	,311	,028	,276	,311	,586*	-,066	,305
	Significance (2-sided)	,546	,429	,364	,226	,206	,240	,878	,120	,078	,017	,802	,084
	N	17	17	17	16	16	16	33	33	33	16	17	33
staxi2_ Anger Out	Correlation after Pearson	,228	,241	,091	,391	,326	,170	,297	,268	,114	-,183	,091	-,047
	Significance (2-sided)	,379	,351	,730	,134	,218	,530	,094	,132	,529	,496	,729	,794
	N	17	17	17	16	16	16	33	33	33	16	17	33
staxi3_ Anger Control	Correlation after Pearson	-,212	-,096	,105	-,061	-,144	,044	-,166	-,105	,090	,251	-,204	,026
	Significance (2-sided)	,414	,713	,689	,822	,595	,873	,357	,562	,620	,349	,432	,884
	N	17	17	17	16	16	16	33	33	33	16	17	33
staxi_ mean	Correlation after Pearson	-,121	,252	,336	,372	,296	,314	,084	,277	,344	,429	-,161	,194
	Significance (2-sided)	,643	,329	,187	,156	,265	,237	,640	,119	,050	,097	,536	,278
	N	17	17	17	16	16	16	33	33	33	16	17	33

Note: yellow: $p < .050$; blue: $p < .100$

Table 5: Correlation between Aggressive Behaviour in the TAP and Dispositional Aggression Traits (Measured with "STAXI"); Included Participants

Included		Z- TAP noise Block 1	Z- TAP noise Block 2	Z- TAP noise Block 3	Z- TAP money Block 1	Z- TAP money Block 2	Z- TAP money Block 3	Z_both versions block 1	Z_both versions block 2	Z both versions block 3	Z-TAP_ money block 1 trial 1	Z-TAP_ noise block 1 trial 1	Z-TAP_ both versions block 1 trial 1l
Anger in general	Correlation after Pearson	-,259	-,481	-,338	-,171	-,257	-,100	-,218	-,361*	-,222	,039	-,269	-,134
	Significance (2-sided)	,351	,069	,218	,526	,336	,712	,240	,046	,230	,885	,332	,473
	N	15	15	15	16	16	16	31	31	31	16	15	31
staxi1_ Anger In	Correlation after Pearson	-,212	-,358	-,537*	-,120	-,140	-,219	-,128	-,217	-,334	-,185	,007	-,064
	Significance (2-sided)	,431	,173	,032	,658	,604	,416	,486	,234	,062	,494	,978	,727
	N	16	16	16	16	16	16	32	32	32	16	16	32
staxi2_ Anger Out	Correlation after Pearson	-,517*	-,462	-,133	-,032	-,183	,161	-,322	-,317	-,003	,070	-,640**	-,353*
	Significance (2-sided)	,040	,072	,624	,906	,498	,552	,072	,077	,986	,797	,008	,048
	N	16	16	16	16	16	16	32	32	32	16	16	32
staxi3_ Anger Control	Correlation after Pearson	,406	,304	,212	-,590*	-,313	-,652**	,024	-,007	-,159	-,330	,312	,057
	Significance (2-sided)	,119	,252	,431	,016	,237	,006	,898	,972	,386	,212	,239	,756
	N	16	16	16	16	16	16	32	32	32	16	16	32
staxi_ mean	Correlation after Pearson	-,295	-,524*	-,560*	-,314	-,272	-,329	-,229	-,311	-,337	-,215	-,220	-,175
	Significance (2-sided)	,268	,037	,024	,236	,308	,214	,207	,083	,060	,423	,412	,339
	N	16	16	16	16	16	16	32	32	32	16	16	32

Note: yellow: $p < .050$; blue: $p < .100$

Table 6: Correlation between Aggressive Behaviour in the TAP and Dispositional Factors (Responsibility and Revenge); Ostracized and Included Participants

Ostracized		Z- TAP noise Block 1	Z- TAP noise Block 2	Z- TAP noise Block 3	Z- TAP money Block 1	Z- TAP money Block 2	Z- TAP money Block 3	Z_both versions block 1	Z_both versions block 2	Z both versions block 3	Z-TAP_ money block 1 trial 1	Z-TAP_ noise block 1 trial 1	Z-TAP_ both versions block 1 trial 1l
Mean responsibility	Correlation after Pearson	-,729**	-,300	-,260	,054	,149	-,078	-,304	-,001	-,055	,102	-,749**	-,167
	Significance (2-sided)	,001	,243	,313	,841	,581	,773	,085	,996	,761	,706	,001	,352
	N	17	17	17	16	16	16	33	33	33	16	17	33
mean Revenge	Correlation after Pearson	,355	,427	,360	,123	,200	,155	,202	,319	,264	,110	,340	,211
	Significance (2-sided)	,162	,087	,156	,649	,457	,568	,261	,070	,137	,684	,182	,238
	N	17	17	17	16	16	16	33	33	33	16	17	33
Included		Z- TAP noise Block 1	Z- TAP noise Block 2	Z- TAP noise Block 3	Z- TAP money Block 1	Z- TAP money Block 2	Z- TAP money Block 3	Z_both versions block 1	Z_both versions block 2	Z both versions block 3	Z-TAP_ money block 1 trial 1	Z-TAP_ noise block 1 trial 1	Z-TAP_ both versions block 1 trial 1l
Mean responsibility	Correlation after Pearson	-,140	-,299	-,051	,015	-,002	,040	-,072	-,142	-,006	-,137	-,074	-,097
	Significance (2-sided)	,604	,261	,852	,957	,994	,883	,697	,437	,976	,613	,787	,597
	N	16	16	16	16	16	16	32	32	32	16	16	32
mean Revenge	Correlation after Pearson	-,081	-,350	-,487	-,080	-,110	-,216	-,087	-,216	-,355*	-,190	-,107	-,145
	Significance (2-sided)	,765	,184	,056	,768	,685	,422	,635	,235	,046	,480	,692	,428
	N	16	16	16	16	16	16	32	32	32	16	16	32

Note: yellow: $p < .050$; blue: $p < .100$

Table 7: Correlation between Aggressive Behaviour in the TAP and Dispositional Stress Traits (Measured with "SRS"); Ostracized participants

reactivity to stress caused by/ in	**Ostracized**	Z- TAP noise Block 1	Z- TAP noise Block 2	Z- TAP noise Block 3	Z- TAP money Block 1	Z- TAP money Block 2	Z- TAP money Block 3	Z_both versions block 1	Z_both versions block 2	Z both versions block 3	Z-TAP_ money block 1 trial 1	Z-TAP_ noise block 1 trial 1	Z-TAP_ both versions block 1 trial 1l
Overwork	Correlation after Pearson	-,273	-,133	-,183	,441	,013	-,178	,131	-,054	-,199	,435	-,253	,190
	Significance (2-sided)	,289	,610	,481	,087	,961	,510	,468	,765	,267	,092	,327	,289
	N	17	17	17	16	16	16	33	33	33	16	17	33
Social conflicts	Correlation after Pearson	-,083	-,042	-,001	,000	,102	-,035	-,040	,027	-,027	,117	,101	,109
	Significance (2-sided)	,751	,873	,996	1,000	,708	,896	,826	,880	,883	,666	,699	,545
	N	17	17	17	16	16	16	33	33	33	16	17	33
Social evaluation	Correlation after Pearson	-,410	-,316	-,253	,241	,382	,274	-,107	,024	,056	,319	-,343	,026
	Significance (2-sided)	,102	,216	,327	,368	,144	,305	,554	,894	,756	,228	,178	,888
	N	17	17	17	16	16	16	33	33	33	16	17	33
Failure at work	Correlation after Pearson	-,275	-,318	-,422	-,048	,045	,146	-,158	-,151	-,103	,292	-,149	,085
	Significance (2-sided)	,286	,214	,091	,861	,868	,590	,379	,402	,570	,273	,567	,637
	N	17	17	17	16	16	16	33	33	33	16	17	33
Pre-Stress-Phase	Correlation after Pearson	,171	,225	,245	,463	,644****	,446	,297	,401**	,330	,389	,156	,271
	Significance (2-sided)	,511	,385	,344	,071	,007	,084	,093	,021	,061	,136	,550	,126
	N	17	17	17	16	16	16	33	33	33	16	17	33
Post-Stress-Phase	Correlation after Pearson	,056	,116	-,009	-,849****	-,580**	-,589**	-,304	-,198	-,330	-,520**	-,110	-,321
	Significance (2-sided)	,831	,658	,973	,000	,019	,016	,085	,271	,061	,039	,674	,069
	N	17	17	17	16	16	16	33	33	33	16	17	33

Note: yellow: $p < .050$; blue: $p < .100$

Table 8: Correlation between Aggressive Behaviour in the TAP and Dispositional Stress Traits (Measured with "SRS");Iincluded participants

reactivity to stress caused by/ in	**Included**	Z- TAP noise Block 1	Z- TAP noise Block 2	Z- TAP noise Block 3	Z- TAP money Block 1	Z- TAP money Block 2	Z- TAP money Block 3	Z_both versions block 1	Z_both versions block 2	Z both versions block 3	Z-TAP_ money block 1 trial 1	Z-TAP_ noise block 1 trial 1	Z-TAP_ both versions block 1 trial 1l
overwork	Correlation after Pearson	,066	-,126	-,248	,261	,069	,156	,105	-,022	-,068	-,125	,257	,057
	Significance (2-sided)	,809	,641	,354	,329	,801	,565	,566	,906	,713	,645	,337	,756
	N	16	16	16	16	16	16	32	32	32	16	16	32
Social conflicts	Correlation after Pearson	,267	,062	-,187	,173	,212	,284	,216	,128	-,001	,125	,384	,279
	Significance (2-sided)	,318	,820	,487	,522	,430	,287	,234	,484	,994	,644	,143	,123
	N	16	16	16	16	16	16	32	32	32	16	16	32
Social evaluation	Correlation after Pearson	,389	-,058	-,092	-,036	,136	,098	,144	,036	-,031	,127	,501*	,289
	Significance (2-sided)	,136	,831	,735	,894	,617	,718	,433	,847	,865	,641	,048*	,109
	N	16	16	16	16	16	16	32	32	32	16	16	32
Failure at work	Correlation after Pearson	,321	,279	,053	-,007	-,181	-,003	,124	-,001	,000	-,105	,285	,079
	Significance (2-sided)	,225	,296	,846	,980	,501	,992	,498	,995	1,000	,698	,284	,668
	N	16	16	16	16	16	16	32	32	32	16	16	32
Pre-Stress-Phase	Correlation after Pearson	-,011	,059	,159	,277	,226	,286	,113	,152	,218	,190	-,004	,082
	Significance (2-sided)	,969	,827	,557	,298	,401	,283	,537	,406	,230	,481	,987	,655
	N	16	16	16	16	16	16	32	32	32	16	16	32
Post-Stress-Phase	Correlation after Pearson	-,051	-,216	-,289	-,037	-,070	-,109	-,003	-,099	-,130	-,190	,083	-,053
	Significance (2-sided)	,851	,421	,277	,890	,796	,687	,987	,589	,478	,481	,759	,772
	N	16	16	16	16	16	16	32	32	32	16	16	32

Note: yellow: $p < .050$; blue: $p < .100$

Erklärung zur Diplomarbeit

Hiermit erkläre ich, dass ich die Diplomarbeit selbständig verfasst und keine anderen als die angegebenen Quellen und Hilfsmittel benutzt und die aus fremden Quellen direkt oder indirekt übernommenen Gedanken als solche kenntlich gemacht habe. Die Diplomarbeit habe ich bisher keinem anderen Prüfungsamt in gleicher oder vergleichbarer Form vorgelegt. Sie wurde bisher auch nicht veröffentlicht.

Pluwig, den _____

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(Angelika Dierolf)