

Ostracism in Childhood and Adolescence: Emotional, Cognitive, and Behavioral Effects of
Social Exclusion

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Abstract

Drawing on theories of development, motivation, and personality, we examined children's and adolescents' emotional and cognitive perception of and explained their behavioral reactions to ostracism, in two experimental studies. In study one, 93 fourth and eighth graders (49 girls) were either socially included or excluded within a virtual ball-tossing game (cyberball). Results demonstrated that ostracism causes negative emotions and a selective memory for social events, similarly for children and adolescents, which verifies the usefulness of cyberball beyond self-reports. In study two, 97 fourth to ninth graders (43 girls) behaviorally reacted to the previously induced ostracism episode within a modified paradigm (cyberball-R). Multinomial logistic regression demonstrated that psychosocial differences between participants displaying prosocial, avoidant, and antisocial reactions followed the expected pattern, which provides initial evidence concerning moderators that prevent children and adolescents from receiving further aggression.

Keywords: Ostracism, Cyberball, Behavioral reactions, Childhood and adolescence

Ostracism in Childhood and Adolescence: Emotional, Cognitive, and Behavioral Effects of Social Exclusion

Ostracism is defined as “[...] acts of ignoring and excluding of an individual or groups by an individual or group.” (Williams, 2001, p. ix). Literature indicates two main functions of why individuals are ignored within or excluded from social contexts. On the one hand, ostracism clearly represents a strategy for acting aggressively and gaining control over social relationships (Williams, 2001). Representing a subset of relational aggression, ostracism is experienced as aversive, because it contradicts the fundamental need to belong (Baumeister & Leary, 1995) and consequently causes detrimental effects for the victims, as empirically supported by surveys in the field of relational aggression (Crick & Grotpeter, 1996; Werner & Crick, 2004) as well as by experimental studies utilizing rejection paradigms (Twenge, Catanese, & Baumeister 2003; Williams, 2001; Zadro, Williams, & Richardson, 2004). On the other hand, ostracism also has a constructive character. In accordance with this perspective, it can be used to control contra-normative behavior (Stormshak, Bierman, Bruschi, Dodge, & Coie, 1999) and to regulate or protect the group (Brewer, 2005).

Both functions imply a regular occurrence of ostracism and, in fact, this form of interpersonal behavior is part of our everyday social life. Based on a diary study, Williams, Wheeler, and Harvey (2001) estimated the frequency of becoming ostracized in our lifetime to amount to about 25.000 times, which is on average one ostracism episode per day. Moreover, research suggests that ostracism is ubiquitous in social contexts, because it similarly occurs in private interactions, such as in romantic relationships (Faulkner, Williams, Sherman, & Williams, 1997), as well as public interactions, such as in school (Rigby, 1999) or at work (Masclet, 2003). Hence ostracism should not necessarily be considered a pathological or non-normative behavior, but rather a common event challenging people to correctly perceive and adaptively react to it.

Developmental Aspects of Ostracism

Based on the variety of research in the field of ostracism, much progress has been made in improving our understanding of social exclusion. Recently, literature also starts to focus on the effects of ostracism in young age. This developmental perspective is of vital importance, because functioning peer relationships are crucial for an adaptive development in childhood and adolescence (McDougall, Hymel, Vaillancourt, & Mercer, 2001), while at the same time ostracism—as part of relational aggression or bullying—is a frequently occurring, developmental risk factor within the school setting (Rigby, 1999; Werner & Crick, 2004; Scheithauer, Hayer, Petermann, & Jugert, 2006).

Research demonstrates that ostracism causes negative affects and threatens basic psychological needs in children and adolescents (Abrams, Weick, Thomas, Colbe, & Franklin, 2011) with an age-related hypersensitivity to ostracism in adolescence (Pharo, Gross, Richardson, & Hayne, 2011; Sebastian, Viding, Williams, & Blakemore, 2010), which, in turn, was found to be related to an increased activity in the anterior cingulate cortex (Masten, Eisenberger, Borofsky, Pfeifer, McNealy, Mazziotta, et al., 2009; Moor, Güroğlu, Op de Macks, Rombouts, Van der Molen, & Crone, 2012), a neural region which seems to process social pain (cf. Eisenberger, Lieberman, & Williams, 2003).

Literature suggests developmental mechanisms, which may explain the hypersensitivity to ostracism in adolescence (cf. Prinstein, Boergers, & Vernberg, 2001): First, with the transition to adolescence, the amount of time that children spend with their peers rises considerably and the importance of peer groups reaches its peak (Larson & Richards, 1991). Second, throughout adolescence, physical aggression becomes less appropriate, but non-physical forms of aggression, such as ostracism, seem to increase with age (Björkqvist, Österman, & Kaukiainen, 1992). Third, a development of social cognitions takes place covering increasing abilities such as perspective-taking, information processing, and reasoning (Steinberg, 2005).

These developmentally based social-cognitive factors may differentiate children's and adolescents' understanding and interpretation of ostracism, as suggested by Abrams and colleagues (2011), who found that ostracism threatens specific needs differentially in childhood and adolescence. While these initial studies started to provide valuable insights concerning social exclusion in children and adolescents, little is known about ostracism effects beyond self-reports. In the present paper we, therefore, focus on the perception of and reaction to ostracism.

Study 1: Emotional and Cognitive Perception of Ostracism

Previous research predominantly examined people's perception of ostracism with the utilization of self-reports assessing feelings of inclusion (Zadro et al., 2004) or indirect indicators such as anger (Buckley, Winkel, & Leary, 2004) or affected need states (Williams, Cheung, & Choi, 2000). Unfortunately, this economical approach depends on participants' willingness to report about aversive feelings and may reveal an incorrect estimation of ostracism effects given its transparent test intention.

Therefore, to obtain objective information regarding the perception of ostracism, the first study investigated an implicit cognitive mechanism based on the following theoretical background: In accordance with Williams' model (1997) the most obviously threatened need during situations of ostracism is the need to belong, which is a fundamental human motivation (Baumeister & Leary, 1995; Maslow, 1943) and, therefore, drives cognitive responses that are influenced by its current state of satiation. With respect to the "needs-threat-repair prediction" (Williams, 2001) short-term ostracism will lead people to attempts of socially reconnecting themselves.¹ The consequential cognitive mechanism implies that ostracized people should implicitly pay greater attention to social events in their environment in order to create opportunities for fulfilling their thwarted need to belong. With a sample of undergraduates utilizing a chat-room rejection paradigm, Gardner, Pickett, and Brewer (2000) showed that "social hunger", similarly as physical hunger, biases the memory for goal-relevant events.

Hence in addition to self-reported emotions, we apply the described cognitive mechanism to investigate the age-related perception of ostracism. Drawing on the theoretical background, we hypothesize that ostracized children and adolescents will report negative emotions and will display a selective memory for social events. Moreover, given the outlined developmental mechanisms, we expect that adolescents will experience ostracism as more hurtful and threatening compared to children due to the increasing importance of peers as well as the rising experience of and sensitivity to ostracism with age.

Method

Sample. Elementary and secondary school students from two federal states of Germany voluntarily participated in this study. The overall sample size amounts to 93 students, of which 53 were fourth graders (29 girls) with an average age of 10.0 years ($SD = 0.6$) and 40 were eighth graders (20 girls) with an average age of 14.4 years ($SD = 0.5$).² All participants were randomly distributed to the control group ($n = 47$) and experimental group ($n = 46$).

Instruments.

Cyberball paradigm. Utilizing the cyberball paradigm (Williams et al., 2000), we experimentally manipulated the independent variable, namely ostracism in the experimental group and social inclusion in the control group.

Insert figure 1 about here

As can be seen in figure 1, this ball-tossing game involves three players, one real participant and two computer players, which are perceived as real due to an introductory cover story. While the participant in the control group gets the ball as much as the other players, the participant in the experimental group becomes ostracized. This standardized paradigm lasts about two minutes in each of the two conditions and starts with the ostracism episode after about 15 seconds in the experimental group.

Emotional indicators. Two instruments analyzed the emotional effects of ostracism. First, we utilized a scale measuring feelings of amusement. Besides the assessment of an emotional indicator, this self-constructed instrument was used to raise the credibility of the cover story (see procedure) and mask the real measurement intention. Hence from the total of 14 items, six were used to generate the scale (e.g.: “It was fun to play the computer game.”), whereas the remaining eight items represented filler items. Participants rated their felt amusement on a four-point Likert scale (from 1 = *not at all* to 4 = *absolutely*) and the mean score presented the indicator feelings of amusement.

Second, we assessed self-reported mood by using the PANAS (Positive and Negative Affect Schedule; Watson, Clark, & Tellegen, 1988) in a validated German version (Krohne, Egloff, Kohlmann, & Tausch, 1996). The PANAS measures positive and negative mood by using ten adjectives, respectively, which present emotional feelings (e.g.: “interested” or “upset”). Participants were asked to rate the extent to which the respective adjective described their current emotional state by using a five-point scale (from 1 = *very slightly or not at all* to 5 = *extremely*). The mean score of the ten positive and ten negative items presented the indicators positive and negative mood, respectively.

Cognitive indicator. Based on the validated instrument by Gardner and colleagues (2000), a cognitive test assessed the selective memory for social events by asking participants to recall previously read diary events of an unknown person. For the purpose of the present study, we applied an adapted version of this diary, which had been adjusted in quantity, content, and complexity for the participating age group. Within a booklet, 16 events were presented, ranging between 22 and 26 words. These events were counterbalanced with regard to their social character, covering social events (e.g.: “Today, I received a package in the mail from my uncle. He sent me the funny pictures from our last vacation together in Spain.”) and individual events (e.g.: “Today, I got a new haircut that I absolutely can’t stand; I hope that my hair grows back quickly.”), as well as their emotional valence (positive and negative

events). Finally, with respect to these two dimensions, the order of the respective events was rotated within the diary. The cognitive indicator was computed as an individual ratio for each participant by dividing the number of recalled social events through the number of total events. The resulting score represents the selective memory for social events and ranged from 0 (*no social recalls*) to 1 (*only social recalls*).

Background information. As control variables, participants' computer use and diary use were assessed. On a four-point Likert scale (from 1 = *never* to 4 = *often*), participants were asked to report the frequency by which they use the respective media.

Procedure. Each participant was taken out of class and accompanied to an extra room in school. In the following cover story, the respective participant was told that the research team is interested in the way people get an impression of other people and to what extent different media (computer vs. diary) influence this process. Therefore, participants started to interact via a computer game (cyberball) with 'other people', afterwards they were instructed to read diary entries of another unknown person, and finally they were asked to answer a questionnaire concerning these interactions covering three aspects: (a) the amusement while playing cyberball and reading the diary; (b) the recall of the previously read diary events; and (c) the felt mood. The final debriefing was given in front of the entire class after all students had participated in the experiment for the purpose of minimizing informational exchange between participants and maintaining the cover story throughout the testing period.

Results and Discussion

With regard to the emotional indicators, all scales displayed sufficient reliabilities with an internal consistency of Cronbach's $\alpha = .72$ for feelings of amusement, .87 for positive mood, and .73 for negative mood, respectively. Concerning the psychometric properties of the cognitive instrument, both age groups were recalling a satisfying number of total events to rule out a floor effect for children ($M = 4.28$, $SD = 1.80$) and a ceiling effect for adolescents ($M = 7.32$, $SD = 2.50$). Moreover, there were no group differences between the control and

the experimental group regarding the total number of recalled events, neither for children nor for adolescents (each with $p > .5$).

Table 1 presents the emotional and cognitive effects broken down for the two experimental conditions. Group differences followed the hypothesized patterns: Ostracized participants reported to have less fun while playing cyberball, a lower positive mood, a higher negative mood, and showed a selective memory for social events. These differences were examined using a 2 x 2 (experimental condition, age group) multivariate analysis of covariance with computer use and diary use as covariates. In accordance with the first hypothesis, differences between the experimental conditions were statistical significant and showed moderate to high effect sizes (Cohen's d). With respect to the second hypothesis, the condition x age-group interactions revealed no significant results.

Insert table 1 about here

On the one hand, experiencing ostracism in childhood and adolescence causes a negative emotional state; on the other hand, it triggers cognitive processes in order to change this unsatisfactory state of belongingness: When becoming acquainted with a novel person, ostracized persons display a selective attention for goal-relevant events as a necessary precondition to refill their thwarted need to belong. Therewith, study one provided novel insights concerning children's and adolescents' cognitive perception of ostracism and a strict manipulation check of cyberball beyond self-reports, which verifies the applicability of this experimental paradigm in study two.

Study 2: Explaining Behavioral Reactions to Ostracism

Given the aforementioned frequency of ostracism episodes over the life course (Williams et al., 2001), there is obviously a need for children and adolescents to learn how adaptively deal with social exclusion during their development. Behavioral reactions to ostracism differ across people and research consistently finds a considerable interindividual variability in this regard (Roecker Phelps, 2001; Williams, 2001). As reviewed by Smart

Richman and Leary (2009), the main types of behavioral reactions to ostracism are prosocial, antisocial, and avoidant by nature.

However, especially for children and adolescents, little is known concerning the underlying mechanisms that are responsible for variations in behavioral reactions to ostracism (Williams, 2007). We assume that the ability to adaptively react to ostracism is influenced by personal moderators, which present abilities that protect children and adolescents from receiving further aggression. A few initial studies already shed light on the question which moderators may play a role in this regard (Ayduk, Mendoza-Denton, Mischel, Downey, Peake, & Rodriguez, 2000; Nezlek, Kowalski, Leary, Blevins, & Holgate, 1997), but the empirical evidence is deficient for children and adolescents. Therefore, in the second study, we aim to explain behavioral reactions to ostracism in childhood and adolescence by identifying their moderating factors.

A framework that theoretically systematizes this research is the cognitive-affective personality system (CAPS; Mischel & Shoda, 1995). This model postulates that behavior is influenced by a set of cognitive-affective units (CAUs) which, in turn, interact dynamically within an intraindividually stable activation network of a person. Five different types of CAUs are responsible for behavioral differences due to their activation, organization, and interrelation: encodings, expectancies and beliefs, affects, goals and values, as well as competencies and self-regulatory plans. Within the present study, all of these CAUs serve as predictors for differences in ostracism reactions and are, therefore, operationalized below with regard to this specific context.

The first CAU within the CAPS model represents 'Encodings', which is operationalized as perspective-taking skills, because this ability helps people to encode the world (Galinsky & Moskowitz, 2000) and particularly facilitates the understanding of complex and ambiguous ostracism episodes (Abrams, Rutland, Pelletier, & Ferrell, 2009). 'Expectancies and Beliefs' are the second type of CAUs, which is operationalized as

withdrawal, because especially anxious expectations and the consequential tendency of social avoidance are evidential person variables explaining interindividual differences in reactions to ostracism (Downey, Mougios, Ayduk, London, & Shoda, 2004). ‘Affects’, the third component of the CAPS model, is operationalized as physical aggression, because anger- and hostility-related affects are important ostracism-related facets, which correspond with physical aggression on the response level (Anderson & Bushman, 2002). The fourth CAU, ‘Goals and Values’, is operationalized as need to belong, which is an important personal value responsible for behavioral differences in reactions to experienced ostracism (Baumeister & Leary, 1995). The final unit of the CAPS model represents ‘Competencies and Self-regulatory Plans’, which is operationalized as anger regulation, because ostracism elicits anger (Buckley et al., 2004), which, in turn, determines behavioral reactions to exclusion (Chow, Tiedens, & Govan, 2008). Figure 2 illustrates the application of the CAPS model for the domain of ostracism by mapping the above described and operationalized CAUs between the ostracism-reaction association.

Insert figure 2 about here

The system’s consideration of behavior as the accessibility of these units and their dynamic interplay is compatible with current cognitive, biological, and neuropsychological models of social behavior. Even though the complexity of human behavior can never be represented by a simple arithmetic equation, the application of this model provides a starting point that guides the examination of interindividual differences in behavioral reactions to ostracism. For this purpose, the second study investigates these personal moderators of ostracism reactions. In accordance with the literature, we expect to uncover all main types of behavioral reactions to ostracism covering prosocial, antisocial, and avoidant reactions. In addition, based on the outlined developmental mechanisms, we expect that prosocial reactions increase with age due to the improvement of social cognitions in general and the increasing ostracism experiences in particular. Furthermore, we hypothesize that psychosocial variables

in the form of CAUs explain behavioral reactions to ostracism demonstrated by a significant overall model fit. More specifically, we expect both non-prosocial reactions (reactive ostracism and aggression) to be predictable by low encodings, low exclusion expectancies, high affects, high inclusion values, and low competencies.

Method

Sample. Students from elementary and secondary schools of a large city in Germany were invited to participate in an online study entitled “Social Interactions in Virtual Space”. A total of 97 fourth to ninth graders (43 girls) with an average age of 11.7 years ($SD = 1.6$) voluntarily responded and took part in the online experiment.

Instruments.

Cyberball-R. The current version of cyberball merely provides researchers with the opportunity to uncover the harmful effects of ostracism. Hence we designed a modification of this paradigm, which goes beyond the experimental initiation of ostracism and allows addressing the research question of behavioral reactions to it. After ostracizing the participants, a pop-up window appears in cyberball-R containing the message that an administrator recognized one player was being socially excluded, so that he encourages the others to include this player and provides two auxiliary functions for the ostracized participant. In accordance with the literature (Smart Richman & Leary, 2009), these extra functions enable participants to display the three main types of behavioral reactions to ostracism: Throwing the ball (a) very hard to the other players (antisocial reaction = aggression), (b) to a wall, wherefrom the ball bounces back (avoidant reaction = reactive ostracism), and (c) in a normal manner to the other players (prosocial reaction = social reintegration).

After this message, cyberball-R continues with the partly inclusion of the real participant and the possible utilization of these extra functions. Because this second level lasts for a total of 25 additional throws, the number of behavioral reactions depends on the course

of the game and specifically on participants' use of the wall. The total number of resulted behavioral reactions ranged between 5 and 11 ($M = 7.38$, $SD = 1.34$).

Psychosocial predictors (cognitive-affective units).

Perspective-taking skills (encodings). Participants rated their perspective-taking skills utilizing the respective subscale from the interpersonal reactivity index (IRI; Davis, 1983; German translation: Lamsfuss, Silbereisen, & Boehnke, 1990). On eight items (e.g.: "I sometimes try to understand my friends better by imagining how things look from their perspective."), participants rated the extent to which these statements apply to them using a five-point scale (from 1 = *never true* to 5 = *almost always true*). The mean score represents the predictor perspective-taking skills ($M = 3.41$, $SD = 0.67$) with a reliability of Cronbach's $\alpha = .76$.

Withdrawal (expectancies and beliefs). On a syndrome subscale taken from the Youth Self Report (YSR; Achenbach, 1991; German translation: Arbeitsgruppe Deutsche Child Behavior Checklist, 1998), participants rated their withdrawn behavior on seven items (e.g.: "I am secretive or keep things to myself.") using a three-point scale (from 1 = *not correct* to 3 = *completely correct*). The mean score represents the predictor withdrawal ($M = 1.48$, $SD = .40$) with a reliability of Cronbach's $\alpha = .75$.

Physical aggression (affects). Utilizing the respective subscale of the aggression questionnaire from Buss and Perry (1992; German translation: Amelang & Bartussek, 1997), participants rated their degree of and attitude toward physical aggression on eight items (e.g.: "Given enough provocation, I may hit another person.") by using a five-point scale (from 1 = *extremely uncharacteristic of me* to 5 = *extremely characteristic of me*). The mean score represents the predictor physical aggression ($M = 2.11$, $SD = 1.01$) with a reliability of Cronbach's $\alpha = .87$.

Need to belong (goals and values). On ten items of the need to belong scale (e.g.: "I want other people to accept me."), participants reported their individual desire for social

inclusion (Leary, Kelly, Cottrell, & Schreindorfer, 2006; German translation: Renner, 2006) by rating the extent to which each respective statement applies to them on a four-point Likert scale (from 1 = *not correct* to 4 = *completely correct*). The mean score represents the predictor need to belong ($M = 2.89$, $SD = 0.44$) with a reliability of Cronbach's $\alpha = .58$.

Anger regulation (competencies and self-regulatory plans). Utilizing the State-Trait Anger Expression Inventory (STAXI; Spielberger, 1988; German translation: Schwenkmezger, Hodapp, & Spielberger, 1992), participants rated on three subscales with eight items each their tendency to direct anger inwards (e.g.: "I boil inside, but I don't show it."), to direct anger outwards (e.g.: "I make sarcastic remarks to others."), and to control anger (e.g.: "I can stop myself from losing my temper.") on a four-point Likert scale (from 1 = *almost never* to 4 = *almost always*). The mean score of each subscale represents the predictors anger in ($M = 2.28$, $SD = 0.65$) with a reliability of Cronbach's $\alpha = .77$, anger out ($M = 2.01$, $SD = 0.64$) with a reliability of Cronbach's $\alpha = .81$, and anger control ($M = 2.77$, $SD = 0.61$) with a reliability of Cronbach's $\alpha = .80$, respectively.

Procedure. Data assessment was realized in an online study. Students from surrounding schools received a written call of participation including a password for our website, which was password protected to control its accessibility. Each participant was given the cover story that the research team is interested in the way children and adolescents interact with unknown peers over the internet. The study started with cyberball-R, which had an overall length of about five minutes. Afterwards, participants were asked to answer a subsequent questionnaire including all psychosocial predictors that took about 10 minutes.

Results and Discussion

In accordance with the first hypothesis, participants showed the complete variety of behavioral reactions and differed considerably concerning their behavioral reactions between each other. Given these interindividually varying reactions, we grouped participants into categories based on their predominant type of behavioral reaction. Thereby, we revealed three

groups, which distribute as follows: (a) prosocial (55%); (b) avoidant (34%); antisocial (11%).

In order to compare these groups and explain the behavioral reactions to ostracism, we performed multinomial logistic regression analysis including two logit models (avoidant and antisocial reactions) contrasting the reference category (prosocial reactions). In the model, we entered demographics (age, gender, and computer use) as controls and psychosocial variables (perspective-taking skills, withdrawal, physical aggression, need to belong, anger in, anger out, and anger control) as theory-based predictors. Continuous variables were z-standardized to facilitate the comparability and interpretation of all regression weights. It is noteworthy, that the intercorrelations between all predictors are at best moderate in their absolute values. Results of the multinomial logistic regression analysis are summarized in table 2.

Insert table 2 about here

In contrast to the second hypothesis, no demographic variable yielded a significant effect, which suggests that behavioral reactions to ostracism seem to be independent of age. In accordance with the third hypothesis, the utility of psychosocial predictors for predicting ostracism reactions was demonstrated by a significant overall model fit, $LR \chi^2(20, N = 97) = 32.07, p < .05$. More specifically, although many effects missed the level of significance due to the lacking statistical power of the small subsamples, the avoidant and antisocial groups are characterized by the expected psychosocial differences in contrast to the prosocially reacting group: Avoidant participants who display reactive ostracism have low exclusion expectancies (social withdrawal) and high affects (physical aggression), while antisocial participants who display aggression have low competencies (anger regulation) as well as tend to have low encodings (perspective-taking skills) and high inclusion values (need to belong).

These findings support the usefulness of the CAPS model for identifying factors that moderate the reaction to ostracism. Therewith, study two provides initial insights concerning psychosocial variables, which may reflect the (un-)ability of children and adolescents to

adaptively react to ostracism and, therewith, serve as risk or protective factors for receiving further aggression.

General Discussion

The primary purpose of this paper was to examine the emotional, cognitive, and behavioral effects of ostracism in childhood and adolescence. The main findings of the two experimental studies refer to the universality of ostracism effects and to the initial explanation of behavioral reactions to ostracism.

Universality of Ostracism Effects

Both studies revealed the hypothesized ostracism effects in childhood and adolescence: Social exclusion is perceived as a fundamental threat, because it negatively affects children's and adolescents' emotions and immediately drives their cognitive state to refill their thwarted need to belong. Moreover, for almost every second participant (45%), ostracism initiates socially incompetent reactions, either relationally aggressive in the form of reactive ostracism or physically aggressive in the form of hurting the source of ostracism. In accordance with the existing literature, these findings support the highly unpleasant character of ostracism (cf. Williams, 2001, 2007). Most interestingly, across both studies, the resulted ostracism effects were found to similarly affect children and adolescents, because no age differences appeared with regard to the emotional and cognitive perception of and the behavioral reactions to ostracism. Concerning the emotional effects, the missing age difference seems to contradict previous research that revealed a hypersensitivity to ostracism in adolescence, but these developmental comparisons were contrasting adults (Pharo et al., 2011; Sebastian et al., 2010). In fact, in accordance with the present findings, studies that compared children and adolescents found no age difference concerning emotional ostracism effects (Abrams et al., 2011; Moor et al., 2012). In combination with the age-independent non-self-report measures (cognitive and behavioral variables), these findings strongly

suggests that the general hurtfulness of ostracism similarly applies to both children and adolescents.

Behavioral Reactions to Ostracism

To our knowledge, study two is the first examination, which integrates both prosocial and antisocial behavioral reactions in the same study. Built on previous studies that changed aspects of the cyberball environment (Van Beest, & Williams, 2006; Van Beest, Williams, & Van Dijk, 2011), we similarly designed a modified version of this experimental paradigm (cyberball-R) in order to investigate an innovative research question. Therewith, we started to explain behavioral reactions to ostracism and revealed several novel insights. First, behavioral reactions to ostracism differ interindividually. Second, the extent to which children and adolescents display behavioral reactions was predictable with the use of psychosocial variables, which were operationalized based on the CAPS model (Mischel & Shoda, 1995). Third, the elements of this model (encodings, expectancies and beliefs, affects, goals and values, competencies and self-regulatory plans) differentiate between prosocial and non-prosocial reactions in the expected manner.

In particular, the finding that low perspective-taking and anger control skills are associated with aggressive reactions supports research on social behavior in young age (Dodge, Pettit, McClaskey, & Brown, 1986) and suggests a vicious circle of ostracism and aggression: Especially children and adolescents with information processing deficits, misinterpret ambiguous situations and assume hostile intentions, which causes anger. In combination with low anger control skills, these children and adolescents will most likely show aggressive behavior which, in turn, increases the likelihood to experience further ostracism, rejection, or aggression by their peers as a reaction to their maladaptive behavior. When we successfully translate these finding into applied fields and enable further projects to develop suitable and effective prevention-intervention programs, we may help children and adolescents facing serious long-term episodes of ostracism.

Limitation and Outlook

It is worthy to note that study two is quasi-experimental in nature, because we merely realized the exclusion condition for examining behavioral reactions to ostracism. Nonetheless, there are several reasons for focusing the exclusion option in study two. First of all, this design matches our research question, because cyberball-R provides the dependent variable, which we aimed to explain, and not the independent variable, which needs to be experimentally manipulated. Secondly, the previous experimental validation of cyberball in study one provided the necessary knowledge concerning the occurrence of ostracism within the exclusion condition, so that study two can build upon this by exploring behavioral reactions to it. Finally, to our knowledge, a theoretical and empirical rationale for antisocial reactions within the inclusion condition is not to be expected and, therefore, the subsequent statistical analyses merely covering prosocial reactions would be unnecessary. However, although study one ensures that cyberball initiates ostracism, upcoming validations of cyberball-R in general and its types of throws in particular are required and will advance this important line of research.

Another noteworthy point one needs to consider when interpreting the data of study two is the limitation to self-reports for the assessment of psychosocial predictors. Even though the online study was anonymous, so that self-reports are free of social desirability, additional ratings by teachers, peers, or adults concerning children's and adolescents' psychosocial skills would have certainly enriched the explanatory power of study two. However, self-reports may not only be more conservative, but considering a person's perception of the world might also be more useful and informative in explaining and predicting human behavior than measuring the objective world itself.

The questionnaire elements in study one were not counterbalanced, so that the feelings of exclusion may have been less present for later items. However, as the questionnaire was very short, mood recovering processes after the exclusion seem to be unlikely; but even if

they exist, it would rather support our findings, as this design effect makes the hypothesis more conservative to test. Similarly, while CAUs are expected to present rather stable person variables (cf. Mischel & Shoda, 1995), one might correctly expect a potential confirmation bias in study two, in which self-reported CAUs were measured after cyberball-R. Hence children's and adolescents' behavior may have caused their self-reports, because being rejected impacts emotion which, in turn, influences how subsequent information are processed and interpreted. Although in both cases the sequence effects are rather minor, we encourage further studies to counterbalance the elements of their study design in order to avoid possible confounding effects.

Together with the few initial studies that addressed a developmental perspective on ostracism, our findings suggest that the ability to cope with ostracism seems to develop between adolescence and young adulthood (cf. Sebastian et al., 2010). In order to identify those critical periods, future studies need to cover a broader age range, ideally over the entire course of life and including longitudinal designs for examining developmental trajectories.

While previous research hardly considered ostracism in childhood and adolescence, the present studies provided valuable insights regarding the emotional, cognitive, and behavioral effects of ostracism. With these findings, we started to generate evidence concerning moderating risk and protective factors concerning ostracism reactions. As the CAPS model proved a valuable framework to guide and systematize this line of research, the expansion of cognitive-affective units with the use of additional predictors offers a theory-based and structured agenda, which promises to improve our understanding of ostracism in childhood and adolescence.

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Footnotes

¹The underlying logic of this exclusion-reconnection prediction implies that rejected people should only be favorably interested in people, who present a realistic option of a renewed social connection (Maner, DeWall, Baumeister, & Schaller, 2007). In contrast, the sources of short-term ostracism who have previously rejected a person are also likely to receive reactive aggression (Buckley et al., 2004; Twenge, Baumeister, Tice, & Stucke, 2001), as investigated in study two of this paper.

²These two homogeneous age groups of ten- and fourteen-year-olds were chosen, because they are both embedded within a comparably stable composition of classmates due to class rearrangements within the German school track system. Therefore, social conditions of the school system do not affect the comparison of ostracism effects between children and adolescents.

Tables

Table 1

Emotional and cognitive outcomes for control group (CG) and experimental group (EG)

	Control group		Experimental group		MANCOVA	Effect Sizes
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>F</i> (1, 87)	Cohen's <i>d</i> ¹
Amusement	2.76	0.65	2.23	0.62	19.15***	0.83
Positive Mood	2.76	0.90	2.16	0.72	16.13***	0.74
Negative Mood	1.41	0.38	1.87	0.64	15.47***	0.87
Selective Social Memory	0.50	0.20	0.61	0.16	7.22***	0.61

Note. ¹Reported as absolute values****p* < .001

Table 2

Multinomial logistic regression predicting behavioral reactions to ostracism

	Reactive Ostracism (Avoidant Reaction)			Aggression (Antisocial Reaction)		
	<i>B</i>	OR	(CI)	<i>B</i>	OR	(CI)
<i>Demographics</i>						
Age	-.16	.86	(0.52-1.42)	-.18	.84	(0.36-1.96)
Gender ¹	-.04	.96	(0.33-2.83)	.25	1.28	(0.23-7.22)
Computer use	-.25	.78	(0.45-1.34)	.50	1.66	(0.82-3.36)
<i>Psychosocial Predictors</i>						
Perspective-taking skills	.14	1.15	(0.63-2.07)	-.75†	.47	(0.17-1.30)
Withdrawal	-.64*	.53	(0.28-1.02)	-.55	.58	(0.20-1.65)
Physical aggression	.58*	1.78	(0.90-3.53)	.26	1.29	(0.49-3.41)
Need to belong	-.28	.76	(0.44-1.30)	.80†	2.22	(0.84-5.85)
Anger in	.44	1.55	(0.78-3.08)	1.00*	2.72	(0.87-8.46)
Anger out	.30	1.35	(0.65-2.78)	-.78	.46	(0.15-1.43)
Anger control	.38	1.46	(0.78-2.76)	-.94*	.39	(0.13-1.14)

Note. Reference group: social reintegration (prosocial reaction); $LR \chi^2(20, N = 97) = 32.07, p < .05$; ¹Gender is coded as 1 = boys, 2 = girls; one-tailed significance, * $p < 0.05$, † $p < 0.1$

Figure Captions

Figure 1. Experimental paradigm to manipulate ostracism (Cyberball; Williams et al., 2000).

Arrows and text blocks are shown for reasons of description and were not presented within the experiment.

Figure 2. CAPS in situations of ostracism (based on Mischel & Shoda, 1995). Arrows

between the CAUs are for reasons of illustrating their complex interrelation and do not present specific associations.

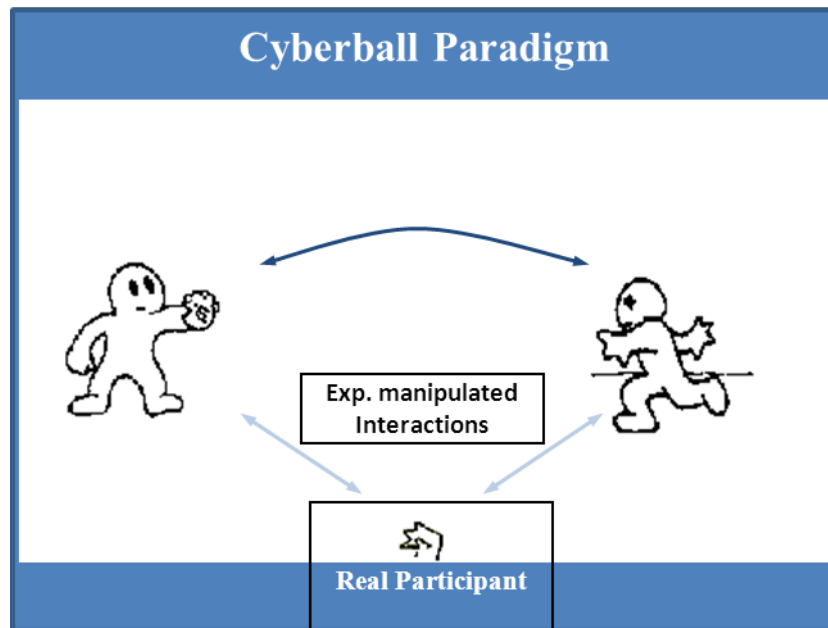
Figures

Figure 1

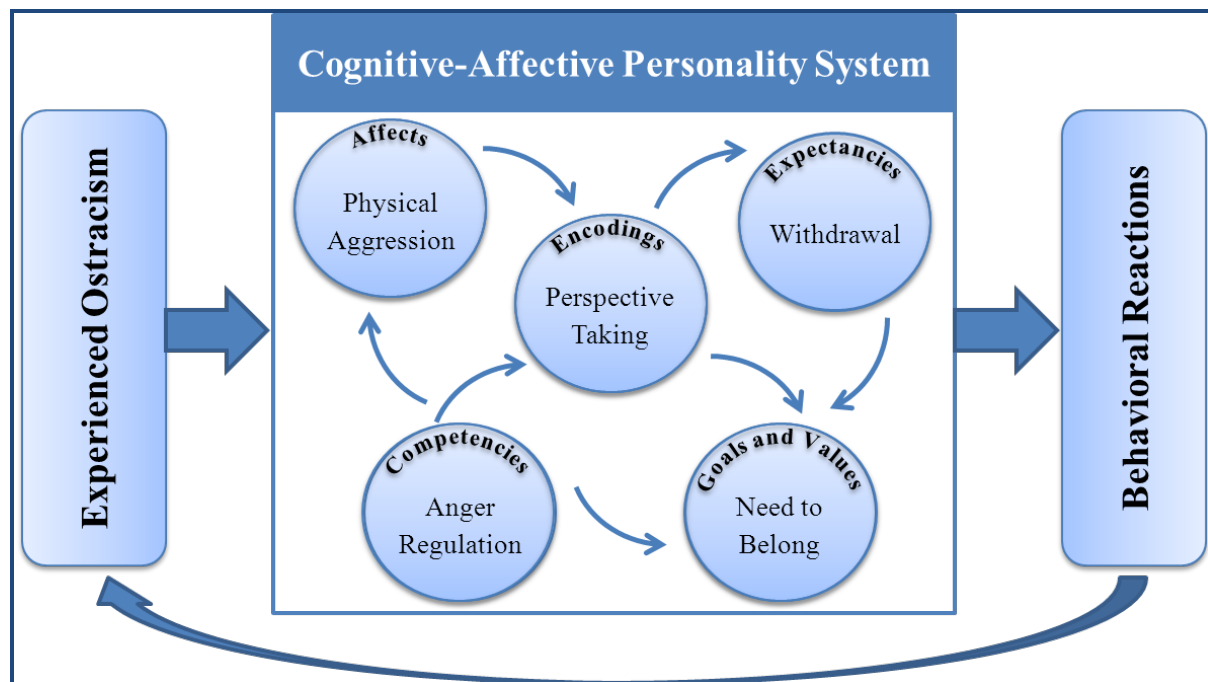


Figure 2