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How children's victimization relates to distorted versus sensitive social cognition: Perception, mood, and need fulfillment in response to Cyberball inclusion and exclusion



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ABSTRACT

This study examined whether victimization is associated with negatively distorted social cognition (bias), or with a specific increased sensitivity to social negative cues, by assessing the perception of social exclusion and the consequences for psychological well-being (moods and fundamental needs). Both self-reported and peer-reported victimization of 564 participants ($M_{\text{age}} = 9.9$ years, $SD = 1.04$; 49.1% girls) were measured, and social exclusion was manipulated through inclusion versus exclusion in a virtual ball-tossing game (Cyberball). Children's perceptions and psychological well-being were in general more negative after exclusion than after inclusion. Moreover, self-reported—but not peer-reported—victimization was associated with the perception of being excluded more and receiving the ball less, as well as more negative moods and less fulfillment of fundamental needs, regardless of being excluded or included during the Cyberball game. In contrast, peer-reported victimization was associated with more negative mood and lower need fulfillment in the exclusion condition only. Together, these results suggest that children who themselves indicate being victimized have negatively distorted social cognition, whereas children who are being victimized according to their peers experience increased sensitivity to negative social situations. The results stress the importance of distinguishing between self-

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reported and peer-reported victimization and have implications for interventions aimed at victimized children's social cognition.

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Introduction

The experience of victimization through bullying—being intentionally attacked, humiliated, and/or excluded by a relatively powerful person repeatedly and over time (Olweus, 2010)—can have detrimental consequences for children's physical and mental health (e.g., Ttofi & Farrington, 2008). Peer victimization, for example, is associated with the development of internalizing and externalizing behavior problems (Ladd, 2006), school disengagement and low school achievement (Buhs, Ladd, & Herald, 2006), and poor physical health (Gruber & Fineran, 2008). Understanding how victimization may be associated with a more negative way of seeing and experiencing social situations could help to explain the poor health outcomes associated with victimization. Moreover, it could benefit the further development and improvement of bullying prevention and intervention programs aimed at improving victimized children's well-being and mental health. Therefore, the current study examined how children's victimization is associated with their perceptions and emotional responses in experimentally manipulated social situations.

Because victimization has been linked to altered social information processing and a hostile attribution bias more specifically (e.g., Camodeca & Goossens, 2005; Hoglund & Leadbeater, 2007; Perren, Ettekal, & Ladd, 2013; Schwartz et al., 1998), the current study examined the association between victimization and information processing. We know that victimization is associated with negatively interpreting others' intentions in ambiguous situations. However, we do not know whether victimization is also associated with general negative interpretation and experience tendencies in social situations. The current study, therefore, examined whether victimization is associated with a general negativity bias in which all social situations are interpreted and experienced more negatively or, rather, with a specific increased sensitivity to a negative social event in which only negative social situations are experienced negatively.

In examining this question, we distinguished between self-reported and peer-reported victimization because there generally is only low to moderate correspondence between these two indicators of victimization and they are differentially associated with negative outcomes (Scholte, Burk, & Overbeek, 2013). Moreover, we examined this question in a late childhood sample because a meta-analysis has shown that the association between a hostile bias and aggressive behavior is strongest among 8- to 12-year-olds (de Castro, Veerman, Koops, Bosch, & Monshouwer, 2002), demonstrating the impact of hostile bias in this age group.

Victimization and negative processing of social information

A process that may contribute to the poor well-being and problematic behavior associated with victimization is a tendency to negatively interpret social information. According to the social information processing model (e.g., Crick & Dodge, 1994), a sequence of information-processing steps determine behavioral responses to social situations. Previous social experiences such as being involved in conflict situations can affect expectations and response options in a child's "database", which in turn can result in an altered perception and interpretation of future social situations. Many studies based on the social information processing model have focused on the second step of the model: the interpretation of cues. Children's attributions of others' intent in hypothetical ambiguous situations in particular have been studied extensively in the light of the social information processing model (e.g., see the meta-analysis by de Castro et al., 2002). The tendency to interpret others' intentions as malicious is often referred to as a "hostile attribution bias".

In line with the social information processing model (Crick & Dodge, 1994), it can be expected that victims' repeated experience with harassment may lead to the expectation and easily accessible

interpretation of being harassed again in future social situations. Indeed, a recent review broadly defining victimization showed that victimization is associated with a more negative interpretation of cues (van Reemst, Fischer, & Zwirs, 2016). More specifically, research using ambiguous vignettes has shown that victimization in children is associated with a tendency to interpret others' intentions as malicious (Calvete & Orue, 2011; Camodeca & Goossens, 2005; Hoglund & Leadbeater, 2007; Perren et al., 2013; Schwartz et al., 1998). The tendency to perceive and interpret social encounters with peers more negatively is likely to be a risk factor for the development of a more general negative view about oneself and/or one's peers, with chronically experiencing negative feelings and displaying undesired (aggressive) behavior as a potential consequence.

Research has also shown that victimization is related to social cognition in that it is linked to how potentially threatening situations are experienced and to how children feel and think about themselves (Camodeca & Goossens, 2005; Camodeca, Goossens, Schuengel, & Meerum Terwogt, 2003; Graham & Juvonen, 1998; Perren et al., 2013). For example, victims were found to experience more anger and sadness than noninvolved children when confronted with an ambiguous situation that has a negative outcome for them when the intentions of the perpetrator are unclear (Camodeca & Goossens, 2005). These findings demonstrate that victimization is associated with an emotional negative "bias" with regard to ambiguous social situations. Repeatedly experiencing more negative affect after social encounters with peers is likely to be a risk factor for the development of chronic poor well-being.

Distorted versus sensitive social cognition

Whereas the responses to hypothetical vignette stories with unclear intentions of a perpetrator have provided us with very valuable insights into the social information processing of aggressive children (e.g., de Castro et al., 2002), victimized children (Camodeca & Goossens, 2005), and prosocial children (Nelson & Crick, 1999), this paradigm is less suitable to examine whether a negative interpretation of a situation would be warranted or not. The word "bias" in the label "hostile attribution bias" has a normative connotation that is not necessarily appropriate (Trachtenberg & Viken, 1994) and seems to assume that children have an inaccurate *distorted* perception of the social situation. However, when there is no objective criterion for whether the situation or intention was indeed malicious, the attributions measured in these ambiguous situations merely represent a negative information processing tendency rather than a bias. Comparing responses to situations that are objectively negative with responses to situations that objectively lack negativity makes it possible to test whether children's responses are indeed distorted or not. We can then test whether children are seeing and experiencing negativity in the absence of objective negativity (distortion) or whether they are perceiving more accurately and experiencing negativity more intensely when negativity is objectively present (sensitivity).

It is important to be able to disentangle these two types of altered information processing because children with distorted social cognition may benefit from other types of interventions compared with children who accurately perceive the social world. Children with distorted social cognition may benefit from a social information processing-focused training program such as Stay Cool Kids (Stoltz et al., 2013), which focuses on the accuracy of the attribution of malicious versus benign intent in ambiguous situations and accurate representation of other children's emotions. However, if one would be sending out a message to children with sensitive social cognition that they are seeing negativity when it is absent, and that they are not skilled at judging social situations, this might cause these children to distrust their own (accurate) judgment. These children who easily pick up actual negativity and thus more intensely experience negative mood after a negative encounter with peers may benefit more from guidance in coping with this negativity and finding ways to improve their social situation.

Measuring peer victimization

In theory, self-reports and peer-reports should assess the same construct, with the only difference being the source of information. However, there is a general finding of a low to moderate correspondence between self-reported and peer-reported victimization (De Los Reyes & Prinstein, 2004; Ladd &

Kochenderfer-Ladd, 2002; Scholte et al., 2013). This indicates that the two sources have different perspectives on who is victimized or not. Children may feel victimized, whereas this is not recognized by their peers, but it may also be the other way around; peers may report children being victimized, whereas these children do not perceive it this way. These different perspectives are reflected in the different predictive power with regard to the negative outcomes associated with peer victimization. For example, Scholte et al. (2013) showed that self-identified victims showed lower levels of emotional adjustment but no social adjustment problems, whereas peer-identified victims were at risk for social maladjustment but not emotional maladjustment. This is in line with previous studies showing that self-reported victimization is indicative of emotional problems (Crick & Bigbee, 1998; Graham & Juvonen, 1998; Gromann, Goossens, Olthof, Pronk, & Krabbendam, 2013), whereas peer-reported victimization is more indicative of social problems such as low peer acceptance and rejection (Crick & Bigbee, 1998; Graham & Juvonen, 1998). We expect self-reported and peer-reported victimization to be related to social cognition differently; therefore, we examined how self-reported victimization, on the one hand, and peer-reported victimization, on the other, are associated with perception, moods, and need fulfillment in the context of social inclusion versus exclusion.

When examining self-reported victimization, the question arises to what extent this reflects actual victimization or to what extent it reflects a tendency to see the world (including one's own social position) negatively. Children's tendency to see the world negatively could account for self-reported poor mood and need fulfillment as well as children identifying themselves as being victimized (Rosen, Milich, & Harris, 2007). Because this negativity tendency might partly underlie the self-report of victimization, we hypothesize self-reported victimization to be related to a negativity bias in both perception and psychological well-being. This hypothesis is not completely in line with the findings of Ruggieri, Bendixen, Gabriel, and Alsaker (2013). They compared self-reported passive victims with children not involved in bullying and found victims' need to belong to be less fulfilled regardless of inclusion or exclusion during Cyberball but found their mood to be more negative and their need for meaningful existence to be less fulfilled after exclusion versus inclusion during Cyberball. The current study adds to the information from the study of Ruggieri et al. (2013) by examining victimization as a continuous variable rather than a categorical variable selecting only a specific type of victim. Moreover, in the current study, both self-reported and peer-reported victimization are taken into account rather than only self-reported victimization, more specific and diverse outcome variables are examined, and the research questions are examined in a much larger sample.

Peers are more likely to know that a child is being victimized when they have witnessed the harassment; therefore, peer-reports may more strongly reflect repeated and visible forms of victimization (Archer & Coyne, 2005; Björkqvist, Österman, & Kaukiainen, 1992). Through this accumulated actual victimization experience, it is likely that these victimized children have become more sensitive to situations that are threatening or negative. Therefore, we hypothesized peer-reported victimization to be related to highly sensitive perception rather than negatively distorted perception and to a stronger negative impact on psychological well-being when being confronted with negative treatment by peers.

The current study

A useful way to examine whether victims show distorted or sensitive social information processing is by presenting children with a computerized version of the ball-tossing game called Cyberball (Williams, Cheung, & Choi, 2000), in which children are preprogrammed to be included or excluded by the other players. This computerized paradigm has been found to be as effective as a face-to-face ball-tossing game with confederates (Williams & Nida, 2011) and is viewed as a "valuable tool" and "an adequate paradigm for research on children and adolescents" (Scheithauer, Alsaker, Wölfer, & Ruggieri, 2013, p. 5).

Cyberball is a very suitable paradigm to examine our research questions because when children scoring high on victimization perceive and experience both the exclusion condition *and* the inclusion condition more negatively, this would be indicative of a negative distortion of social cognition. These children would then perceive and experience more negativity in general even in situations where there are no objective signs of negativity (the inclusion condition during Cyberball). It could also be

that children scoring high on victimization are in fact very good observers who are sensitive to cues that signal actual negativity. In that case, these children will perceive and experience negativity only when they have actually been presented with a negative situation (exclusion during Cyberball) but not when there are no objective signs of negativity (inclusion during Cyberball). In the current study, we expected self-reported victimization to relate to a negative distortion in both perception and psychological well-being, and we expected peer-reported victimization to relate to highly sensitive perception and psychological well-being.

Method

Participants

The current study was part of a larger study (van Noorden, 2016) for which a total of 838 children from 34 third-, fourth-, and fifth-grade classrooms from 11 schools in the Netherlands were recruited. Parents received a letter explaining the nature and procedure of the study and explaining that they could indicate if they did not want their children to participate. Children could refrain from participation beforehand or stop at any time during the study. This procedure was approved by the institutional review board (IRB) of the first author's institute. Nine children were not allowed to participate by their parents; no children objected to participation themselves or stopped during the study. In addition, 29 children were absent during data collection, resulting in a participation rate of 95.5%. The sample was predominantly Caucasian, with 96.9% of the children being born in the Netherlands. The current study examined the data of the participants in five of the seven Cyberball conditions in the larger data collection. That is, we excluded the two conditions in which participants observed another player being excluded and included only the five conditions in which participants were included or excluded themselves. This decision is in keeping with the traditional measures of hostile biases that involve the participant as the recipient of potentially hurtful behavior; it is also consistent with the idea that being excluded oneself may be qualitatively different from witnessing exclusion (e.g., more salient, more impactful). This resulted in a potential subsample of 568 children. Four children in the subsample did not complete the Cyberball-related measures, resulting in a final sample of 564 children ($M = 9.9$ years, $SD = 1.04$; 49.1% girls).

Materials

Victimization

Self-reported victimization was based on the nominations children gave on the question "Who in your classroom has bullied you?" Children could nominate as many of their classmates (none to all) as they desired. The number of classmates nominated was divided by the total number of classmates that could be nominated, resulting in a percentage score ($M = .04$, $SD = .06$). Peer-reported victimization was based on the nominations children received on the question "Who in your classroom is bullied by others?" Children could, again, nominate as many of their classmates (none to all) as they desired. The number of nominations each child received was standardized within classroom to account for the classroom size ($M = -.03$, $SD = .95$). The self-reports and peer-reports of victimization were significantly but only weakly associated, $r(564) = .15$, $p < .001$.

Social exclusion

Social exclusion was manipulated using the Cyberball game, originally developed by Williams et al. (2000) with minor adjustments. The Cyberball game consisted of 50 trials and lasted approximately 3 min. The child played with three pre-programmed other players depicted by animated figures and labeled as Player 1, Player 2, and Player 3 on the screen. The child was represented by a hand at the bottom center of the screen and identified with her or his own name. There were two main conditions: inclusion (coded as 0) and exclusion (coded as 1). The inclusion condition consisted of two versions. In the overinclusion version, the child received the ball 50% of the time from each opponent. In the regular inclusion version, the child received the ball 33.3% of the time from each opponent. The

exclusion condition consisted of three versions. In the excluded by one version, the child received the ball once from Player 1 in the beginning and then never again. Players 2 and 3 threw the ball to the child 33.3% of the time. In the excluded by two version, the child received the ball once from Player 1 and once from Player 3 in the beginning and then never again. Player 2 threw the ball to the child 33.3% of the time. In the excluded by three version, the child received the ball once from each player in the beginning and then never again.

For each indicator of victimization, multivariate analyses of variance (MANOVAs) with moods and needs as the outcome variables were conducted. They were once conducted to compare the effects of victimization in the inclusion subconditions and once to compare the effects of victimization in the exclusion subconditions. Results showed no evidence of any significant interactions of victimization with subconditions, indicating that the subconditions did not qualify the association between victimization and the moods and needs experienced after playing Cyberball. Consequently, we combined subconditions for future analyses and only distinguished between the inclusion and exclusion conditions.

Perceived exclusion

Children rated how often the three other players (1, 2, and 3) together threw the ball to them on a 7-point scale (1 = *a lot less than to the other players*; 4 = *just as much as to the other players*; 7 = *a lot more than to the other players*). Children also indicated whether they were excluded during the game by selecting “yes” or “no”. Because of an error in the programming of the experiment, the participants from the first four participating classrooms were not presented with the “yes” or “no” question, resulting in an *N* of 496 instead of 564 for the two logistic regressions with perceived exclusion as the dependent variable.

Moods

Four moods were assessed: angry, anxious, sad, and happy. Children were asked to indicate to what extent they had experienced each mood during the Cyberball game (e.g., “During Cyberball I felt angry”) on a 7-point scale (1 = *not at all*; 7 = *very much*).

Fundamental needs

The Need Threat Scale (van Beest & Williams, 2006) for adults was reworded for use with children. The Need Threat Scale assessed belongingness, control, meaningful existence, and self-esteem, with 5 questions for each need (20 items in total). Children were asked to think about how they felt during the game. Example questions included “I felt excluded” (belongingness), “I felt like the other players decided everything” (control), “I felt invisible” (meaningful existence), and “I felt like I was just as good as the other players” (self-esteem). Children rated each statement on a 7-point scale (1 = *not at all*; 7 = *very much*). Negatively formulated items were reverse coded. Mean scores for each 5-item need scale were created, with higher scores meaning higher fulfillment of that need. Reliability (Cronbach’s α) was .91 for belongingness, .64 for control, .81 for meaningful existence, and .76 for self-esteem.

Procedure

The participating children in each classroom completed the study simultaneously on individual 10-inch netbook computers. We created space between the individual desks so that children could not look at each other’s computer screens. Privacy was further created by placing tabletop partitions around each computer on each desk and telling children that the partitions marked their personal space that should be respected by everyone. The nature of the study was explained, and instructions were provided. We explained that we were interested in children’s opinions and that there were no right or wrong answers. Children could ask questions or stop at any time. In addition, the definition of bullying was provided and interactively discussed to make sure that all children understood bullying as a subtype of aggression in which an individual or group of individuals attacks, humiliates, and/or excludes a relatively powerless person repeatedly and over time, with forms of bullying being

physical, verbal, relational (gossip and social exclusion), and cyberbullying (e.g., Olweus, 2010; Salmivalli, 2010).

After completion of the first set of questions, which included the victimization measures, the researchers announced that it was time to play a special computer game called Cyberball in which the children would be virtually throwing a ball with three classmates. Children were told that the netbooks were connected via a wireless network and that they would not know or find out later whom they were playing with. They were asked to mentally visualize what was happening during the game such as the location and identity of the other players. Children were instructed to sit silently in front of their netbooks during the game and to ask questions only if their netbooks did not work. To ensure the credibility of the cover story, children needed to enter a code in order for them to start simultaneously. Written instructions were provided on the screen. Several screens with messages such as “Loading the game ...” and “Waiting for the other players ...” appeared to make the game credible.

After the game, the manipulation check was administered and children’s moods and fundamental needs were assessed. Children were then thoroughly debriefed about the game and were asked to sign a secrecy agreement in which they promised not to tell children from other classrooms or schools about the setup of the game. They were told that if they wanted, they could discuss the game with their teacher, parents, or peers who had already participated in the study. Finally, all participants received a small gift, and the teacher received a €10 book voucher. The entire data collection lasted about 1.5 h; the measures used for this study took about 0.5 h to complete.

Analytic plan

To answer the research questions of this study, it was examined whether *self-reported victimization* and *peer-reported victimization* predicted reported exclusion, mood, and needs fulfillment after inclusion and/or exclusion in a Cyberball game. This was tested with a hierarchical logistic regression analysis for perceived exclusion and multiple separate hierarchical linear regression analyses conducted on reported number of ball throws received, feeling angry, feeling sad, feeling anxious, feeling happy, fulfillment of the need to belong, need for control, need for meaningful existence, and need for self-esteem as dependent variables.

In the first set of analyses, condition and self-reported victimization were entered as predictors in the first step of the analysis, and the interaction of condition and self-reported victimization were entered in the second step (see Table 2 in Results). In the second set of analyses, condition and peer-reported victimization were entered as predictors in the first step of the analysis, and the interaction of condition and peer-reported victimization were entered in the second step (see Table 3 in Results).

Table 1

Uncorrected means and standard deviations for perception, mood, and need fulfillment per condition.

	Inclusion (<i>n</i> = 231)		Exclusion (<i>n</i> = 333)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Perceiving exclusion	<u>0.03</u>	0.18	<u>0.56</u>	0.50
Perceived ball throws	<u>4.60</u>	1.50	<u>2.37</u>	1.57
Anger	<u>1.26</u>	0.90	<u>2.42</u>	1.92
Anxiety	1.06	0.36	1.09	0.44
Sadness	<u>1.11</u>	0.49	<u>1.66</u>	1.48
Happiness	<u>5.87</u>	1.71	<u>4.56</u>	2.22
Need for belongingness	<u>6.25</u>	0.90	<u>4.00</u>	2.07
Need for control	<u>3.73</u>	1.33	<u>2.61</u>	1.30
Need for meaningful existence	<u>5.81</u>	1.00	<u>4.01</u>	1.82
Need for self-esteem	<u>5.50</u>	1.15	<u>4.02</u>	1.56

Note: Means that are underlined differ significantly by condition in the regressions ($p < .05$).

Results

Manipulation check: Effect of Cyberball condition

The analyses with self-reported and peer-reported victimization yielded similar results for the main effect of condition on perception, mood, and need fulfillment. In discussing these findings, therefore, we refer to the uncorrected means in [Table 1](#).

There were main effects of condition on all outcome variables except for anxiety (see [Tables 2 and 3](#) below). Children in the exclusion condition more often reported being excluded and reported receiving relatively fewer ball throws than children in the inclusion condition. Moreover, children in the exclusion condition felt more angry, more sad, and less happy when playing the Cyberball game than children in the inclusion condition. Children in the exclusion condition also reported less belongingness, control, meaningful existence, and self-esteem than children in the inclusion condition.

Self-reported victimization

Perceived exclusion

Self-reported victimization strongly predicted perceived exclusion (see [Table 2](#)). Children who reported being bullied by a larger percentage of the classroom were more likely to report that they were being excluded during the Cyberball game. Self-reported victimization also predicted the number of balls children reported they had received during the game. Children who scored higher on self-reported victimization also reported receiving fewer balls during the Cyberball game. The absence of the interaction between condition and self-reported victimization indicates that, regardless of whether children were actually excluded during the Cyberball game, self-reported victimization was associated with a higher likelihood of reporting being excluded and receiving fewer balls.

Mood

Self-reported victimization predicted children's reported feelings of anger, sadness, and happiness after playing the Cyberball game (see [Table 2](#)). Children with higher self-reported victimization scores reported higher levels of feelings of anger and sadness and reported lower levels of happiness. These effects were not moderated by condition, indicating that the association between self-reported victimization and mood existed regardless of whether children were included or excluded during the Cyberball game.

Need fulfillment

Self-reported victimization also predicted the fulfillment of fundamental needs (see [Table 2](#)). Children with higher self-reported victimization scores reported less belongingness, control, meaningful existence, and self-esteem. This effect was not moderated by condition for any of the needs, indicating that the association between self-reported victimization and need fulfillment existed regardless of the experience during the Cyberball game.

Peer-reported victimization

Perceived exclusion

Peer-reported victimization did not predict perceived exclusion, nor were there significant interactions of condition with peer-reported victimization on perceived exclusion (see [Table 3](#)).

Mood

Peer-reported victimization predicted sadness (see [Table 3](#)). Children with high peer-reported victimization scores reported more sadness after playing Cyberball. For anger, sadness, and happiness, there was a significant interaction between condition and peer-reported victimization. In the exclusion condition, peer-reported victimization was positively associated with anger ($r = .13$, $p = .02$) and sadness ($r = .25$, $p < .001$) and was negatively associated with happiness ($r = -.14$, $p = .01$). In

Table 2
Self-reported victimization: Results from hierarchical logistic and linear regression analyses.

	Perceived exclusion		Reported number of balls received		Angry		Anxious		Sad		Happy		Belongingness		Control		Meaningful existence		Self-esteem	
	Exp (B)	χ^2	β	R ²	β	R ²	β	R ²	β	R ²	β	R ²	β	R ²	β	R ²	β	R ²	β	R ²
Step 1		195.59 [*]		.35 [*]		.13 [*]		.00		.06 [*]		.11 [*]		.32 [*]		.16 [*]		.27 [*]		.23 [*]
Condition	38.65 [*]		-.58 [*]		.34 [*]		.03		.22 [*]		-.30 [*]		-.54 [*]		-.38 [*]		-.50 [*]		-.45 [*]	
Self-reported victimization	39586.39 [*]		-.09 [*]		.10 [*]		.02		.12 [*]		-.13 [*]		-.14 [*]		-.09 [*]		-.14 [*]		-.14 [*]	
Step 2		2.81		.00		.00		.00		.00		.00		.00		.00		.00		.00
Condition × Self-Reported Victimization	0.00		.13		-.07		.01		.07		-.06		-.02		.02		.03		-.03	
Total		198.41 [*]		.35 [*]		.13 [*]		.00		.06 [*]		.12 [*]		.32 [*]		.16 [*]		.27 [*]		.23 [*]

Note: N = 564 (for perceived exclusion, N = 496).

^{*} p < .05.

Table 3
Peer-reported victimization: Results from hierarchical logistic and linear regression analyses.

	Perceived exclusion		Reported number of balls received		Angry		Anxious		Sad		Happy		Belongingness		Control		Meaningful existence		Self-esteem	
	Exp (B)	χ^2	β	R^2	β	R^2	β	R^2	β	R^2	β	R^2	β	R^2	β	R^2	β	R^2	β	R^2
Step 1		177.55 [*]		.34 [*]		.12 [*]		.00		.07 [*]		.10 [*]		.31 [*]		.15 [*]		.26 [*]		.21 [*]
Condition	36.84 [*]		-.59 [*]		.34 [*]		.03		.24 [*]		-.31 [*]		-.55 [*]		-.39 [*]		-.51 [*]		-.46 [*]	
Peer reported victimization	1.25		-.06		.05		-.04		.15 [*]		-.04		-.07		-.01		-.10 [*]		-.03	
Step 2		1.02		.00		.01 [*]		.00		.03 [*]		.02 [*]		.01		.01 [*]		.01 [*]		.01
Condition × Peer reported victimization	1.51		-.06		.14 [*]		.05		.25 [*]		-.17 [*]		-.10 [*]		-.16 [*]		-.12 [*]		-.14 [*]	
Total		178.56 [*]		.34 [*]		.13 [*]		.00		.10 [*]		.11 [*]		.31 [*]		.16 [*]		.27 [*]		.22 [*]

Note: $N = 564$ (for perceived exclusion, $N = 496$).

^{*} $p < .05$.

the inclusion condition, peer-reported victimization was not significantly associated with anger, sadness, and happiness.

Need fulfillment

Peer-reported victimization predicted meaningful existence (see Table 3). Children with higher peer-reported victimization scores reported lower meaningful existence during the game. For the fulfillment of the needs for belongingness, control, meaningful existence, and self-esteem, there were significant interactions between condition and peer-nominated victimization. In the exclusion condition, peer-reported victimization was negatively associated with experienced belongingness ($r = -.13$, $p = .02$), control ($r = -.13$, $p = .02$), meaningful existence ($r = -.17$, $p < .01$), and self-esteem ($r = -.12$, $p = .02$) during the Cyberball game. In the inclusion condition, belongingness, meaningful existence, and self-esteem were not significantly associated with peer-reported victimization.

Discussion

Victimization by peers has been linked to a hostile attribution or interpretation bias (Camodeca & Goossens, 2005; Hoglund & Leadbeater, 2007; Perren et al., 2013; Schwartz et al., 1998). The current study aimed to test whether peer victimization is indeed associated with negatively distorted social cognition in which all social situations are interpreted and experienced more negatively or, rather, with highly sensitive social cognition in which victimization is associated with a more intense response to actual negative social events specifically. This was examined by presenting children with social situations that were objectively positive or negative (inclusion and exclusion during a Cyberball game) and measuring their perception, mood, and need fulfillment during the Cyberball game. The Cyberball manipulation was effective, with children's perceptions, mood, and need fulfillment being in general more negative after exclusion than after inclusion. We examined both self-reports and peer-reports of victimization because we expected these indicators to differentially predict perception, mood, and need fulfillment.

The findings with regard to self-reported victimization were in line with the “distortion” hypothesis. Self-reported victimization was associated with the perception of being excluded more and receiving the ball less as well as with more negative mood and lower need fulfillment. These effects were not moderated by the social situation during Cyberball. So, regardless of being excluded or included during the Cyberball game, children with higher self-reported victimization scores perceived and experienced more negativity than children scoring lower on self-reported victimization.

A possible explanation for why self-reported victimization is associated with negative perception, mood, and need fulfillment could be a tendency to have a general negativity bias. Because self-reported peer victimization is associated with depressive cognitions (Barchia & Bussey, 2010; Gibb, Abramson, & Alloy, 2004), a negative cognitive style might both account for self-reported low well-being and add to the likelihood of classifying one's own situation as one of victimization. By also measuring mood at pretest, it should be possible to further examine whether encountering (positive and negative) social situations contributes to poor well-being or whether self-reported victimization is associated with poor well-being regardless of exposure to a social situation.

The findings with regard to peer-reported victimization were in line with the “sensitivity” hypothesis rather than with the “distortion” hypothesis. For peer-reported victimization, there was no evidence for bias or sensitivity with regard to perception; children high in peer-reported victimization were as likely to report exclusion in both Cyberball situations as children low in peer-reported victimization. With regard to psychological well-being, peer-reported victimization was associated with more negative moods and lower fulfillment of fundamental needs only in the exclusion condition, not in the inclusion condition, supporting the “sensitivity” hypothesis. In the exclusion condition, children with higher levels of peer-reported victimization felt more negative than children with lower levels of peer-reported victimization. However, in the inclusion condition, children with high levels of peer-reported victimization felt just as good as children with low levels of peer-reported victimization.

A possible explanation for why peer-reported victimization is associated with increased emotional sensitivity is that peer-reports may be more strongly based on direct and visible instances of

victimization (Archer & Coyne, 2005; Björkqvist et al., 1992). Through this accumulated direct victimization experience in social situations, it is likely that again being confronted with social exclusion revives previous victimization experiences, making the current experience more intense. To examine whether repeated victimization experience is a key factor in this process, it would be interesting to examine whether stable peer-reported victims show stronger emotional sensitivity than incidental peer-reported victims. This further examination could also look into whether children's previous victimization amplifies their current exclusion experience, whether their threshold for experiencing exclusion is lower, or whether both mechanisms jointly contribute to the increased emotional sensitivity associated with peer victimization.

Strengths, limitations, and future research

The current study contributes to our understanding of the social cognition and well-being of victims and to our thinking about social information processing in general. In addition to examining how children's social functioning relates to attributions of intent in ambiguous hypothetical situations (e.g., Camodeca & Goossens, 2005; de Castro et al., 2002; Nelson & Crick, 1999), the current study defined "biased" social information processing in a more concrete way. It focused not on whether an interpretation in itself is negative but merely on whether the negative interpretation or response seems warranted given the positivity/negativity of the social situation. The current study challenges researchers studying social information processing, and the hostile attribution bias in particular, to think critically about what these vignettes are measuring and invites them to think of alternative measurement operationalizations of "biased" information processing. Together with other new measures of youths' social information processing, such as those on detection of angry faces among happy faces and vice versa (Young & Lochman, 2011) and visual attention for hostile and nonhostile cues (Horsley, de Castro, & Van der Schoot, 2010; Troop-Gordon, Gordon, Vogel-Ciernia, Ewing Lee, & Visconti, 2016), these types of studies can assist in further identifying and understanding key elements in altered social information processing.

The current study provides interesting new insights based on a consistent set of findings across multiple outcome variables in a large unselected sample using an experimental paradigm of social exclusion. However, there are also limitations that need to be acknowledged. In the current study, self-reported victimization was measured with the percentage of classmates nominated by a child as her or his bully. However, the multi-item victimization scale of the Bully/Victim Questionnaire (Solberg & Olweus, 2003), which focuses on the frequency of incidents as reported by the victim, is another more commonly used indicator of self-reported victimization. Because both self-report measures tap into different cognitions about one's own victimization (bullied by many vs. bullied often), it would be interesting to examine how both types of cognitions regarding one's own victimization relate to children's social information processing during Cyberball inclusion and exclusion. The study conducted by Ruggieri et al. (2013) partially gives more insight into this matter because they also used the Cyberball paradigm to study the role of self-reported victimization experience in the moods and fundamental needs after social inclusion or exclusion in a small sample of 26 passive victims and 32 noninvolved children using a self-report measure that focused on the frequency of victimization to identify the victims. In their study, victims experienced less fulfillment of their need to belong than noninvolved children, regardless of inclusion or exclusion during Cyberball, and victims experienced more negative moods and less meaningful existence than noninvolved children in the exclusion condition but not in the inclusion condition. This suggests that frequency of victimization also is related to the mood and need fulfillment during Cyberball inclusion versus exclusion. However, the associations of self-reported victimization with mood and need fulfillment in their study are different from the findings in the current study. Determining why this is the case is difficult because there are many ways in which the study by Ruggieri et al. (2013) differs from our current study. In addition to the difference in the measurement of victimization, the study by Ruggieri and colleagues also compared passive victims with noninvolved children instead of looking at victimization continuously; the study by Ruggieri and colleagues was conducted with a small selected sample, whereas the current study examined a big nonselected sample, and the participants in their study were on average 2 years older than the participants in our study.

Practical implications

Together, the results from the current study suggest that children who indicate themselves that they are being victimized seem to have a general perception and emotion negativity bias regardless of the actual situation, whereas children whose peers report that they have been bullied seem to experience more negativity only when in an actual negative social situation. This may mean that interventions and support offered to victims could benefit from tailoring to what extent children indicate themselves to be victimized and to what extent peers indicate them as victims.

If one identifies victims with self-reports, efforts to support these victims might benefit most from an approach that focuses on these children's general tendency to interpret the world around them negatively regardless of the actual level of negativity of the situation. Programs that are aimed at the role of "top-down" processing might be most beneficial for this group. Making victims aware of the possibility that they are seeing too much negativity when objectively there was no negativity in the situation, and challenging them to more objectively examine social situations (is it really happening or are their "colored glasses" talking?), might help these self-reported victims. Such insights might not only help children to feel better but also help them to respond to situations in a more constructive manner once they have interpreted the situations in a more positive way like nonvictimized children do.

Moreover, this general negativity bias associated with self-reported victimization also shows some resemblance to depressive symptoms. Cognitive theories of depression (Beck, 1987) emphasize the role of negative cognitive biases such as the tendency to interpret ambiguous information in a negative way (Butler & Mathews, 1983; Rude, Wenzlaff, Gibbs, Vane, & Whitney, 2002) in the development and maintenance of depressive symptoms. Programs aimed to alleviate depressive symptoms through cognitive bias modification (CBM) training, therefore, might also have the potential to benefit self-reported victims. This type of training has already been shown to positively affect adolescents' interpretations and mood (Lothmann, Holmes, Chan, & Lau, 2011).

If one identifies victims with peer-reports, efforts to support these victims might benefit less from programs aimed at improving their perception of social situations given that the current study shows that peer-reported victims do not show distorted perception of social situations. Sending out a message to these children that they should learn to better observe situations because they are likely to misperceive social situation could make them doubt the social perception skills that they do possess. Rather than focusing on perception of social situations, these children might benefit more from learning strategies for coping with the negative moods and low need fulfillment they experience when encountering actual negative situations. Teaching them to reappraise situations in order to feel less negative, or encouraging them to pay more attention to the instances in which they do have positive interactions with peers, may be more in line with the idea of victims with a "sensitive" rather than "distorted" view on their social surroundings. Future studies should empirically examine to what extent differences in social cognition between self-reported and peer-reported victimization play a role in effective help for victimized youths.

Conclusion

The current study took a new approach to studying (negativity) "bias" in social information processing by examining perception, mood, and need fulfillment in objectively positive and negative social situations. Using this new approach, the current study showed that both biased and sensitive social cognition can be associated with victimization, depending on the measurement of victimization. Children who indicate themselves that they are being victimized seem to have a general negativity bias regardless of the actual situation, whereas children who have been victimized according to their peers do not show a perception bias but do experience more negativity when they are in an actual negative social situation. This suggests that it is important to distinguish self-reported from peer-reported victimization and challenges us to think critically about whether and when our studies on hostile biases actually provide evidence for negatively distorted social cognition.

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