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Development and Aging

The role of severity and intentionality in the intensity of Schadenfreude attribution: A developmental study of Danish children

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Understanding envy and schadenfreude requires complex interpersonal social cognitive abilities, such as social comparison and evaluating the Self, but also understanding agency and intentionality. Previous studies of children's development of envy/schadenfreude addressed whether children understand and experience schadenfreude as opposed to compassion/sympathy or whether children's attribution of schadenfreude is a consequence of envy provoked by a disadvantageous social comparison. In this study, we take a step further and investigate the roles that agency and severity of the damage play in mediating children's attribution of schadenfreude. The participants were 144 Danish children aged 3–9 years divided into two age groups. Children were presented with eight stories supported by pictures showing intentional versus accidental and irreparable versus repairable damage to envied objects. The results show that the intensity of envy/schadenfreude, as well as the happy victimizer phenomenon, varies depending on the severity of damage, agency and intentionality. When damage is accidental, schadenfreude is expressed with less intensity compared to when damage is intentional (led by an agent). When damage is irreparable, children attribute less intense feelings of schadenfreude compared to when it is repairable. In addition, only the older children expressed repairable damage carrying more intense schadenfreude and only in the accidental condition. In general, children consider intentional and repairable damage more intense than accidental and irreparable damage, and this is mediated by age. The results are important for understanding the developmental trajectory of children's complex emotions and for educational programmes directed towards supporting this development.

Key words: Emotion attribution, envy, happy victimizer, intentionality, schadenfreude.

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INTRODUCTION

The ability to understand emotions is linked to one's abilities to engage in and understand interpersonal relationships. Emotional understanding plays an important role in one's decision making in social and interpersonal situations, and also for resolving conflicts in order to obtain goals and benefits. Identifying other people's emotions through facial expressions, and understanding the relation between desire and satisfaction, are part of children's early emotional development (Bartsch & Wellman, 1989; Lagattuta, 2005). As children gain more knowledge about the social world they also become able to develop more complex understandings of their own and others' emotional experiences. Consequentially, they also begin to understand and make use of cultural display rules, which guide them in expressing emotions properly in a social context (Saarni, 1999). The ability to follow given display rules, however, requires something more than awareness of the relation between desires and emotions. It requires other social cognitive abilities such as taking a specific emotional perspective, knowing moral norms, awareness of affective communication, and mentalising (Saarni, 1999). Some emotions are closely linked to typical facial expressions, but others lack a specific facial expression, so they require a more complex knowledge of the context in which they occur. In the latter situations, the child needs to obtain certain clues from the social context to be able to identify the emotions of others, and in order to act coherently within social norms.

Envy and schadenfreude are social emotions, and a prior knowledge of contextual clues is required in order to detect when others express these emotions. The basic contextual keys to

understanding envy are that there is a desire among two or more people for an object (a quality) that confers an advantage on the possessor, a social comparison that produces a negative emotional evaluation (inferior self-evaluation) for those who do not possess it, and, if it is malicious envy, the desire for that advantage to disappear. In contexts of malicious envy the emotion of schadenfreude appears (Smith, 2008; van de Ven, 2009). These contextual clues are related to a set of complex interpersonal social cognitive abilities, such as making social comparisons with others evaluating the Self, and intervening in the distribution of resources (Smith, 2008). Learning how children come to understand these social emotions during their early development is relevant for understanding their early perspectives on social interactions and their behaviors in social interactions, as well as for developing emotional education interventions and supporting clinical groups that struggle to understand complex emotions.

This study aims to capture children's understanding of envy and schadenfreude, how this changes during development, and the role of agency and intentionality. For this purpose, the following sections deal with the definitions of envy and schadenfreude and the factors that regulate the intensity of these emotions.

Envy and schadenfreude

Envy is the suffering caused by the unattainable desire to obtain something (the fortune) that is possessed by another person, while schadenfreude (*skadefryd* in Danish) consists of the happiness caused by another person's misfortune (Miceli & Castelfranchi, 2007; Smith & Kim, 2007). Recent studies of envy and

schadenfreude in adults demonstrated that only malicious envy (wanting the envied person to lose his/her advantage) leads to schadenfreude, while benign envy is a motivational precedent for improving the self (van de Ven, Hoogland, Smith, Dijk, Breugelmans & Zeelenberg, 2014).

Envy arises from social comparison, mainly when the comparison is upward. That is, the person who is envious perceives him/herself as being inferior in contrast to another person (the envied).

The perception of the inaccessibility of the desired (envied) object, and its relevance to the Self, are among the characteristics that can regulate the intensity of suffering and cause wicked desires over the envied person (Ben Ze'ev, 1992). If the envied suffers the misfortune of losing the advantage, the envier may feel the emotion of schadenfreude, even though he has not satisfied his own desire to gain the advantage that the other has lost. Here, schadenfreude may take two forms: the envier may feel pleasure from the misfortune of another, or may obtain the satisfaction of seeing the inequality between envier and envied disappear. Consequently, the misfortune of the envied becomes a balm for the suffering of the envier. By contrast, when the fortune or advantage is perceived as accessible to others, even if the envier feels pain, envy is a motivation to improve him/herself (van de Ven *et al.*, 2014).

The intensity of schadenfreude

There are some theories and studies attempting to elucidate what factors contribute to modulating the intensity of schadenfreude. Ben Ze'ev (1992) discusses the aspect of intensity and its impact on the feeling of schadenfreude in the context of envy. He argues that the severity of the damage can regulate the intensity of schadenfreude, for example, minor damage makes the feeling of schadenfreude more intense than severe damage. Furthermore, he suggests that severe damage should not motivate happiness or schadenfreude on the part of the envier. In addition, other social psychological theories argue that the feeling of agency serves to satisfy our desires and intentions and can provoke specific emotions (Bandura, 2006). Consequently, when misfortunes are the product of the envious person's intention, rather than happening by accident, schadenfreude might be experienced more intensely. In the present study we investigate these two social cognitive aspects, addressing them as (1) the role of the severity of the misfortune (minor versus severe damage) and (2) the cause of the damage (accidental versus intentional), and examine their possible influence on the intensity of schadenfreude in envy situations.

Envy and schadenfreude and the 'happy victimizer' phenomenon in children's development

Both schadenfreude and envy are emotions which intentionally and consciously go against socio-moral norms. To feel envious or to experience schadenfreude and, in particular, to express these emotions constitutes a violation of moral and social norms. This could explain why these complex emotions do not have clear bodily expressions. Studies of the development of complex emotional attributions show that children under the age of seven

years attribute happiness (shown as an immoral feeling) to characters who transgress social and moral rules in order to obtain a reward (e.g., stealing candy from a partner, removing a peer from the swing to keep it for himself). At this early age it seems the child's evaluation of the transgressor's emotion is based on the correspondence between his desires and his satisfaction; he feels happy (e.g., because he gets the swing), regardless of breaking a social rule (he pushed another child to get the swing) (Barden, Zelko, Duncan & Masters, 1980; Keller, Lourenço, Malti & Saalbach, 2003; Murgatroyd & Robinson, 1993; Nunner-Winkler & Sodian, 1988). Thus, young children show the behaviour known as the "happy victimizer" phenomenon, which is an emotional response pattern of joy attributed to a character who violates social and moral norms (Krettenauer, Malti & Sokol, 2008).

We propose certain parallels to account for children's abilities to engage in the happy victimizer phenomenon and for them to understand the emotions of envy and schadenfreude, but also posit that some differences may exist. In the case of schadenfreude, as in the happy victimizer phenomenon, the child attributes happiness to an envier when another suffers a misfortune, although contrary to the happy victimizer, the misfortune is not brought out by an intentional act of the envier. Importantly, in situations of schadenfreude it is the emotion and the emotional feeling itself rather than a specific act that transgresses a moral norm. Furthermore, display rules prevent people from showing happiness at the misfortune of another. The same thing happens with envy; it is not morally appropriate to show pain or suffering engendered by the success of another. In fact, as we will see shortly, recent studies indicate that schadenfreude attribution follows the same developmental trajectory as the phenomenon of the happy victimizer.

Cognitive explanations about how young children become able to attribute schadenfreude (happiness) are driven by the idea that children focus exclusively on the benefit to the transgressor agent or their satisfaction of that agent's desire even though they judge the agent's action or intention as morally negative. In contrast, older children between the ages of 6 and 7 have become aware of display rules and can coordinate both aspects of reality: the satisfaction of their desires (their goals) and the means by which they obtain them (Keller *et al.*, 2003). However, whether it is the benefit alone that is the full explanation of why children attribute happiness to the transgressor could be questioned, as studies on children's development of envy and schadenfreude show that these emotions seem to be multifaceted.

Attribution of schadenfreude in children

In the following we identify two lines of investigation in previous studies of children's development of schadenfreude. One line has addressed whether children understand and experience schadenfreude as an emotion opposed to compassion/sympathy. Within this line of research, the questions posed are: (1) what role do mental states play in people's intentions and desires; (2) do children express moral evaluation of actions, and (3) do children consider the responsibility for the misfortune of others to play a role? In a second line of research, children's attribution of schadenfreude has been studied as a consequence of the situation

of envy provoked by a disadvantageous social comparison (where misfortune falls on the advantaged or envied character). More precisely, the difference between these two lines of research is that in the first line the damage leading to schadenfreude is exclusively presented as an intentional action with the victim obtaining a specific benefit, whereas in the second line envy precedes schadenfreude and the victim does not obtain a benefit.

We find it important to incorporate the role of children's understanding of moral evaluations of intention and satisfaction of desires in determining the intensity of schadenfreude, as research on infancy shows that children are able to understand others as intentional agents from the age of 1 year. The aspects of intentionality and satisfaction were investigated in children in a study carried out by Shiverick and Moore (2013). They asked 5- to 11-year-old children to judge a character's emotion in socio-moral scenarios, using a design that controlled for intentionality and desire. The children were presented four stories about a character "A" who snatches an object from character "B," but with different endings to each story: (1) "A" obtains or (2) "A" fails to obtain the object and (3) "A" executes or (4) "A" fails to execute his plan. Their results showed that children's attribution of positive emotions varied with the fulfillment of the character's desire, but not in accordance with the satisfaction of the intention underlying the action. When the desire was unsatisfied although the intention was enacted, emotional intensity increased with age, whereas no age differences were identified when the intention was blocked.

Another study showed that 4- to 8-year-old children rate more intense feelings of schadenfreude towards a protagonist suffering a misfortune when the protagonist expressed a bad intention than when he expressed a good intention (Schulz, Rudolph, Tscharaktschiew & Rudolph, 2013). Interestingly, when the protagonist had expressed a bad intention, 5-year-olds hardly differed in their intensity of schadenfreude compared to older children; hence, the happy victimizer phenomenon did not emerge. Finally, the study by Schindler, Körner, Bauer, Hadji and Rudolph (2015) corroborates that schadenfreude is more intense when the agent who experiences damage held an immoral intention (e.g., hurting someone) than when there was no such intention. They also found that young children reported more schadenfreude than older children. In this study, too, the children assessed the severity of the damage in each story and found that in the most severe condition (*Sara falling from a tree*) there was less intensity of schadenfreude than in the less severe one (*Max falling into the pool*). Also, severity of misfortune correlated positively with the child supporting the attitude of helping a person in need. When the damage was severe there was more intention to help.

In our previous studies of schadenfreude as a consequence of envy, young children were presented with a narrative about two characters involved in an upward social comparison that provokes envy in one of them. The envier is then presented witnessing the misfortune of the envied which causes schadenfreude. For example, children are presented with a story like the following: "Sara has a new backpack, and Teresa wants a similar backpack, but her parents cannot buy it." Then, "Teresa sees how Sara's backpack is torn." After each episode, the experimenter asks about the emotions of the characters, but the key question that establishes whether the children have attributed envy is their recognition of the notion of schadenfreude, which is captured

through the final question "How does Teresa feel when seeing Sara's misfortune?" Cross-cultural studies with this script have found that Zapotec (indigenous children living in Oaxaca, Mexico) and Danish children from 3 to 5 years of age attribute happiness to Teresa (the envier) (Jensen de López, Quintanilla, Giménez-Dasí & Sarriá, 2012; Quintanilla & Sarriá, 2009). In these cross-cultural studies the proportion of responses of happiness increased with age. Results from other studies with 6- to 9-year-old children, presenting the same script, contrastingly showed that at this age Spanish children attribute the envier the emotion of sadness or feeling bad (Recio & Quintanilla, 2015). In this study, the authors examined whether the intensity of envy and schadenfreude changed depending on the type of the envied object, and found the pattern of the happy victimizer. The study specifically examined whether envy and schadenfreude were more intense when the evaluation was aimed towards the Self or when it was aimed towards material belongings. Two different types of enviable objects were presented in the study, those related to the evaluation of the Self (being publicly recognized by a skill: swimming or singing) and those related to material belongings (a bike or scooter). Results indicated children scored more intensity of schadenfreude in skill conditions (evaluation of the Self) than in conditions where the material belongings were at stake. Again, the developmental pattern of the happy victimizer was found: younger children (under the age of 6) attributed a high intensity of schadenfreude, whereas older children rather attributed sadness to the envier on seeing the misfortune of the other (the envied). From these results it was suggested that envy and schadenfreude hold at least two dimensions. The basic dimension concerns mentalist understanding, where children link desires and emotions. Children know that happiness occurs when a desire is satisfied. The second dimension, which is the multifaceted dimension of envy and schadenfreude, has to do with display rules which consist in knowing when it is appropriate to express an emotion, and clearly demand more advanced mentalistic abilities. The results also suggest that children begin to recognise and to use display rules around the age of six (Recio & Quintanilla, 2015). What is curious in the example presented above with the backpack story is that children attributed happiness to Teresa (the envier), even though she had not obtained any physical object (e.g., the nice backpack). Unlike the transgressor act in the happy victimizer stories, where the agent achieves the desired object, in envy situations, the damaged object in itself is not the desired result (at least, not explicitly). We therefore argue that in envy situations the desire consists of obtaining emotional compensation for the initial inequality, rather than the desired object per se.

Another issue which is related to the happy victimizer pattern has to do with the cause of the damage. In the happy victimizer paradigm, the damage is caused intentionally (with different moral values: bad or good intentions), while in the envy and schadenfreude paradigm the damage has so far been seen to occur accidentally with no clear agent. Due to these important methodological differences, results from these two strands of studies cannot fully be compared.

Following the outline of work suggesting envy preceding schadenfreude, the purpose of the present study was to compare the effect of two different conditions on the intensity of schadenfreude: (1) the degree of severity of the damage (reparable

or irreparable damage) and (2) intentionality (accidental or intentional damage). In contrast with previous studies about intentionality or severity in which the agent transgresses or hurts the other, in our study misfortune is presented as an instance of clear inequality between the envier and the envied (he or she doesn't have what the other has but yearns for it).

We present three hypotheses. First, considering the evidence about the happy victimizer phenomenon identified in English- and German-speaking cultures, we expect that when Danish children reach the age of 7 years they will attribute sympathy or pity regardless of the cause of damage (intentional or accidental) or the severity of damage (reparable or irreparable). Our second hypothesis concerns the role of agency – the ability of exerting power over a specific outcome – which we predict to be an important influencing factor in children's emotional attribution (Harris, 2008). Hence, we expect the degree of *schadenfreude* will be mediated by the agent's action (in this case the envier). The damage provoked intentionally will thus be more pleasant than the damage occurring accidentally. Finally, for our third hypothesis, we investigate the role of the degree of damage and following Ben Ze'ev (1992) we predict that when the harm to the envied object is minor or easy to repair, the pleasure experienced by the envier is greater, and when the harm is irreparable the pleasure diminishes, which on the other hand might indicate the feeling of pity for the envied protagonist. In our design, gender was used as a control variable among the participants and also for the characters in the presented stories.

METHOD

Participants

The participants were 144 Danish children aged 3–9 years, divided into two age groups for the analysis: sixty-nine 3- to 5-year-olds (mean age 55.35 months, *SD* = 9.77, range 36–71) and seventy-five 6- to 9-year-olds (mean age 93.27 months, *SD* = 11.8, range 72–114). All of the children were from rural areas of Jutland, Denmark.

Design and material

We used eight stories across four conditions: two stories in each condition, with the gender of the character balanced. (Table 1 contains examples of each type of story.) The variable cause of damage was represented by stories with a character whose advantage was damaged either by the envier's (intentional) action or accidentally. The variable severity was represented by stories with a character whose advantage was damaged irreparably or reparably. Each story was represented by two pictures. All children heard all eight stories. The stories and pictures were created for the purpose of this study and had been piloted previously with children aged 3–5 years.

Hence, the overall design is an experimental factorial design: within-subject variables were 2 (cause of damage) \times 2 (severity), and between-subject variables were 2 (age groups) \times 2 (gender of participants). The order of presentation was counterbalanced.

Procedure

The children were interviewed individually by trained psychology students in a quiet room at their kindergarten or school on two consecutive days: four stories were presented per day in a counterbalanced order. The interviewers read aloud each story and presented the respective pictures

that were laid out on the table in front of the child. All interviews were video recorded. The children first expressed their emotional judgment followed by expressing the valence of their response on an emotional intensity pictorial rating scale. The scale consisted of happy or sad faces presented in three different sizes in order to represent the intensity of the emotion. Children practiced with the scale of emotional intensity before they heard the stories. This practice consisted of the experimenter showing the child drawings of objects or activities followed by asking "how happy/sad are you when do X?". The child then rated the intensity of its own emotion on the pictorial scale. Children easily learned to use the scale. Following this short training phase, children were presented the stories and asked to attribute emotions to the characters according to their situations. For example, for the question capturing emotional intensity (question number 5 in Table 1: "how happy/sad is X?"), the child only had to indicate how happy or sad the characters were.

While coding the responses we acknowledged that positive or negative emotional responses (i.e. "good," "happy," "content," "bad," "sad," "angry," "envy") are indicative of the child's understanding of the sequence involved in feeling *schadenfreude* and which we describe as the following: (1) recognition that inequality exists between characters and that this generates opposite emotions; (2) knowing the cause of inequality has disappeared (the desired object has lost its value); and (3) recognizing that this transformation changes the character's emotions. It is important to mention that it is not the isolated emotion in its self that is indicative of the child's understanding of the complex emotion. The response pattern expressing that the envier first feels bad, then after the resolution of the inequality he/she now feels good is considered to reflect the child's understanding of the emotional situation of envy and *schadenfreude* and is the methodology commonly used in developmental psychology to study young children's complex emotions (see Lagattuta, 2005; Schulz *et al.*, 2013).

Scoring

In the first scenario, there were two emotional questions (one question about each character). Responses to these two questions were coded as either positive emotions "good" (e.g., good, happy, etc.) as or negative emotions "bad" (e.g., sad, bad, etc.). The response pattern of Good-Bad (one has the desired object, while the other does not have anything) was used to identify whether the child was able to attribute the emotion of envy in the first scenario. These questions served as a control in order to determine whether children understood that upward comparison (e.g., intentional cause/irreparable damage scenario, in which Mads feels that Silas received the teachers' approval and that his own work is less appreciated) provoked different emotions in the two characters. We calculated the percentage of responses attributing envy in this first scenario. Then, in the second scenario, when the object was damaged, the interviewer asked again about the emotions of each character (Questions numbers 3 and 4 in Table 1).

Emotional intensity

Finally, the last question was about how happy/sad the envier felt when the object was damaged. Each story was scored on a continuum from 3 to –3, where the positive numbers (1–3) indicated *schadenfreude* (the envier feels happy), and the negative numbers (–1 – –3) indicated pity (the envier feels sad). Mean scores were obtained for each condition and type of story.

RESULTS

We first present descriptive analyses of the children's response patterns in the first scene of the stories. In Table 2 we present the percentage of children that produced response patterns suggesting that they attributed envy in the first scene for each of the conditions. This information indicates that the children from two

Table 1. Examples of stories across the four conditions

Damage	Cause	
	Intentional cause	Accidental cause
Irreparable damage	<p><i>Scenario 1:</i> Silas and Mads are about to make drawings for the class bulletin board. Silas drew a fun and beautiful clown with a lot of colors. The teacher looks at Silas drawing and says “what a nice drawing, Silas.” Mads drew a house. but the teacher does not say anything about Mads’s drawing</p> <ol style="list-style-type: none"> 1. <i>How does Silas feel?</i> 2. <i>How does Mads feel?</i> <p><i>Scenario 2:</i> But look what happens! Mads takes Silas’ drawing and rips it to pieces. When the teacher goes to hang it on the bulletin board, the drawing is all torn up</p> <ol style="list-style-type: none"> 3. <i>How does Silas feel now?</i> 4. <i>And, how does Mads feel now that Silas’ drawing is destroyed?</i> 5. <i>How happy/sad is Mads?</i> <p>Then the scale with smiles/sad faces is introduced in conjunction with the last question</p>	<p><i>Scenario 1:</i> Sara and Mary are playing with their dolls. Sara has a nice new doll that can walk on its own. Mary’s doll is old and worn and can’t walk. Sara shows Mary how her doll can walk. Mary would like to have a nice new doll like Sara has, but her parents cannot buy one for her</p> <ol style="list-style-type: none"> 1. <i>How does Sara feel?</i> 2. <i>How does Mary feel?</i> <p><i>Scenario 2:</i> But look what happens! Sara’s doll is broken, and now it cannot walk any more</p> <ol style="list-style-type: none"> 3. <i>How does Sara feel now?</i> 4. <i>And how does Mary feel when she sees that Sara’s doll is broken?</i> 5. <i>How happy/sad is Mary?</i> <p>Then the scale with smiles/sad faces is introduced in conjunction with the last question</p>
	<p><i>Scenario 1:</i> The first part of the story is similar to the story presented above, but the second part changes: (names and physical appearance of characters were changed in each story)</p> <ol style="list-style-type: none"> 1. <i>How does Per feel?</i> 2. <i>How does Ole feel?</i> <p><i>Scenario 2:</i> But look what happens! Ole hides Per’s drawing under the table. When the teacher is about to hang Per’s drawing on the bulletin board, it is gone, and he has no drawing. Only Ole has a drawing now</p> <ol style="list-style-type: none"> 3. <i>How does Per feel now?</i> 4. <i>And, how does Ole feel now that Per’s drawing has disappeared?</i> 5. <i>How Happy/Sad is Ole?</i> <p>Then, the scale with smiles/sad faces is introduced in conjunction with the last question</p>	<p><i>Scenario 1:</i> The first part of the story is similar to the story presented above, but the second part changes: (names and physical appearance of characters were changed in each story)</p> <ol style="list-style-type: none"> 1. <i>How does Thea feel?</i> 2. <i>How does Rikke feel?</i> <p><i>Scenario 2:</i> But look what happens! The doll falls into a big pool of mud and becomes quite disgusting. Now, Thea cannot play with it</p> <ol style="list-style-type: none"> 3. <i>How does Thea feel now?</i> 4. <i>And how does Rikke feel when she sees that Thea’s doll is disgusting?</i> 5. <i>How Happy/Sad is Rikke?</i> <p>Then the scale with smiles/sad faces is introduced in conjunction with the last question</p>

age groups understand that the upward comparison provokes opposite emotions between the characters. It is also a confirmation that they are able to take an emotional perspective. A summary of the mean scores for emotional patterns within each condition and age group is shown in Table 2.

In general, we observed that for each of the four conditions more than 85% of the children correctly attributed the emotion of envy in upward comparison. As expected, the older children performed slightly better than the younger children.

Emotional intensity

The results from the coding of emotional intensity showed that, as age increased, there was a clear decreasing tendency in emotional intensity from higher to lower schadenfreude for all conditions.

As we can see in Figs. 1 and 2, the mean scores for emotional intensity are positive (schadenfreude) for the younger children (3–5 years of age) whereas for the older children (6–9 years of age)

the mean scores are negative (pity) for both intentional and accidental conditions. This pattern is consistent with what is known as the happy victimizer phenomenon in younger children.

In order to examine emotional intensity, we performed repeated measures ANOVA. Within-subject variables were 2 (cause) \times 2 (severity) and between-subject variables were 2 (age groups) \times 2 (gender). As mentioned earlier, the sample was split into two age groups for the analyses. It would have been desirable to assess the changes throughout each age group however this was not possible given that the sample size by age group did not allow us to run this statistical analysis. Nevertheless, according to our objectives, it is possible to observe changes in emotional attribution between these two age groups because a visible change appears at six years similar to other studies demonstrating the phenomenon of happy victimizer.

The between-subject contrast indicated that age was significant as a main factor ($F(1,140) = 12.6$, $p = 0.001$, $\eta^2 = 0.08$) (Hypothesis 1), while gender was not significant ($F(1, 140) = 1.9$, $p > 0.05$). For the within-subject contrasts, the cause of damage

Table 2. Percentage of children producing response patterns that reflect envy attribution in the first scenario (upward comparison) by age group.

Cause	Severity	Younger	Older	Total
Accidental	Reparable	85.35	89.30	87.30
	Irreparable	87.70	91.35	89.50
Intentional	Reparable	86.25	90.00	88.13
	Irreparable	86.25	93.35	89.80
Total Mean		86.38	91.00	

(accidental or intentional) as main factor was significant ($F(1,140) = 6.55, p < 0.05, \eta^2 = 0.04$), with the intentional cause producing more intense schadenfreude ($M = 0.76, SE = 0.16$) than the accidental cause ($M = 0.47, SE = 0.16$; 95% CI's [0.44, 1.0], [0.16, 0.80], respectively) (Hypothesis 2). Severity of damage also showed a significant effect ($F(1,140) = 4.36, p < 0.05, \eta^2 = 0.03$); indicating reparable damage caused more intense attribution ($M = 0.68, SE = 0.15$) than irreparable damage ($M = 0.55, SE = 0.16$; 95% CI's [0.38, 0.99], [0.24, 0.87], respectively) (Hypothesis 3).

An interaction effect was found between cause and gender ($F(1,138) = 9.68, p < 0.05, \eta^2 = 0.04$), indicating that girls scored similarly in both conditions, whereas boys scored higher in the intentional than in the accidental condition (see Fig. 3).

A further interaction severity \times cause \times age was significant ($F(1, 140) = 6.06, p < 0.05, \eta^2 = 0.04$), as represented in Fig. 4. To break down the interaction we ran two repeated measures t -tests for each age group taking the critical p -value as 0.01 to reduce the risk of Type I errors. Results indicated that the older group ($n = 75$) obtained higher scores of emotional intensity in reparable ($M = 0.15$) than irreparable condition ($M = 0.07$); $t(74) = 2.67, p = 0.04$. Also, the intentional condition ($M = 0.24$) yielded numerically higher scores than the accidental condition ($M = -0.09$; $t(74) = 1.98, p = 0.05$); however, these

two differences only approached significance under our stricter criterion for p -values. For the younger group, t -tests disclosed no significant effect of severity ($t(68) = 0.84, p > 0.05$) nor cause of damage ($t(68) = 1.5, p > 0.05$). The analysis of simple effects in this interaction was performed within the accidental condition in the older group. Here the t -test again showed significant differences between irreparable and reparable conditions ($t(74) = -2.7, p = 0.009$) but this was not the case for the intentional condition ($p > 0.24$) (see Fig. 4). By contrast, in the younger group, the effect of reparability was not significant for any condition ($p > 0.05$).

The remaining interactions cause \times age, cause \times gender \times age, severity \times gender, severity \times age, severity \times age \times gender were not significant (all $p > 0.05$).

DISCUSSION

The main object of our study was to investigate children's attribution of emotional intensity to a character who was witness to the misfortune of another. In our design the misfortunes were either caused accidentally or intentionally with the damage being reparable or irreparable. The underlying relationship between the two characters was an upward social comparison, which is known to promote the emotion of envy. The majority (more than 85%) of the children's responses about the emotions of the characters in the first scenario of upward comparison reflected the children's abilities to attribute envy to the characters; whoever had the advantage felt good and whoever did not felt bad. This indicated that Danish children from the age of three understand the relationship between desire and satisfaction within the two characters in an upward comparison, supporting previous research (Recio & Quintanilla, 2015). Thus, children in this context of social comparison were able to evaluate the emotional intensity.

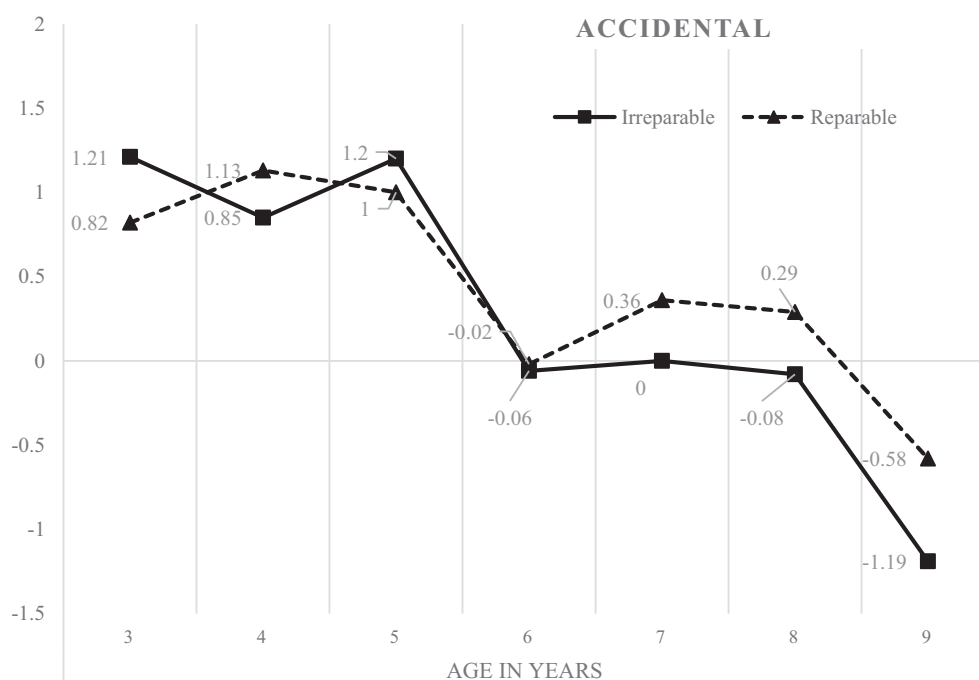


Fig. 1. Mean scores emotional intensity by age group: Accidental cause.



Fig. 2. Mean scores emotional intensity by age group: Intentional cause.

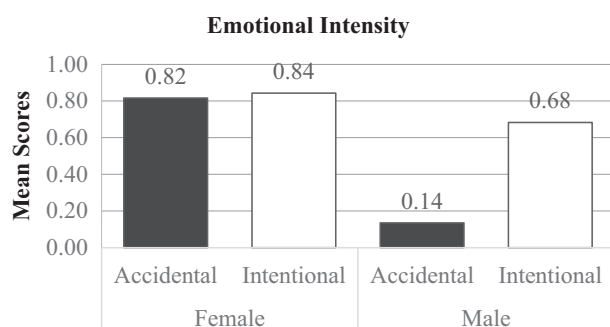


Fig. 3. Interaction cause × gender.

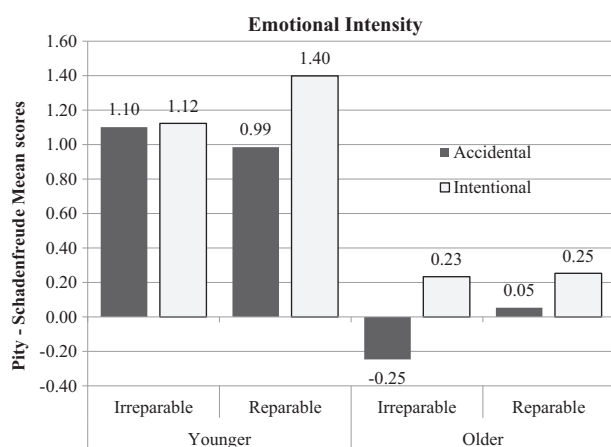


Fig. 4. Mean scores of emotional intensity in four conditions for each age group.

In general terms, the results with respect to the role of intentionality and the cause of the damage in determining emotional intensity are very clear. In the context of schadenfreude children seem to consider intentional and reparable damage to cause more emotional satisfaction than accidental and irreparable damage. However, this seems to be mediated by age. It was only the older children that considered reparable damage more enjoyable

than irreparable damage when it was accidental, but not when it was intentional. These results highlight the role of agency, in the context of envy. The pleasure itself serves the function of ending the inequality that produces envy. Similarly, the results are aligned with the thesis of Ben Ze'ev (1992) in which he posits that the intensity of schadenfreude can be mediated by whether the damage is severe compared to when it is non-severe. Likewise, the results on severity as a factor that modulates the emotional intensity of schadenfreude coincide with those obtained by Schindler *et al.* (2015), in which children were sensitive to the severity of the damage and, consequently, the schadenfreude intensity was lower for more severe damage than for less severe damage.

The decreasing trend of schadenfreude intensity, as the age of the children increased, also coincides with previous studies in which envy precedes schadenfreude (Recio & Quintanilla, 2015).

The results obtained in our study produced the same pattern of emotional attribution as documented for the phenomenon of the happy victimizer. However, Krettenauer *et al.* (2008) suggested that, in the happy victimizer paradigm, intention per se is the mediating factor and therefore the children can infer that the protagonist wants to satisfy his desire. Contrary to this, in our study, the condition involving intentionality of the protagonist does cause harm, but it does not lead to the envier obtaining the desired object as the damage does not offer any material benefit. Despite this, in our results we still see that children do attribute schadenfreude in all age groups, and also express the happy victimizer phenomenon, although with variation. That is to say, 3- to 5-year-olds express schadenfreude (happiness), whereas 6- to 9-year-olds express sadness or pity for the damage of another.

Furthermore, although to a lesser extent, the attribution of joy occurs in the condition of accidental damage where there is no explicit intention to harm, for example, when the envied toy breaks on its own. Therefore, intentionality in itself does not explain why children attribute joy to the wrongdoing of others. From our point of view, the context of envy that precedes the misfortune of the envied can explain why the damage produces schadenfreude – it repairs and re-establishes the equality between the protagonists, both in intentional and accidental conditions.

On the other hand, Lagattuta (2008) demonstrates that attributing positive or negative emotions to the transgressor depends on the elements of the narration in which the children support their reasoning. If children focus on desire and satisfaction they will attribute positive emotions (the character achieves its goal), whereas if the children focus on the rules and the consequences of noncompliance with them, they will attribute negative emotions to the transgressor character (the character has broken a rule and feels bad). The situations presented in our study showed a wish to harm that did not generate any benefit, and still younger children attribute intense *schadenfreude*, even though there is no satisfaction of the desire, for example, gaining the object that the other has. Older children under certain conditions attributed negative emotions or low *schadenfreude* intensity, even though the experimental situation did not present any moral rule or its violation (e.g., laughing at the misfortune of others) that the children could have used to support their reasoning. Lagattuta's argument about desire and satisfaction does not seem to be clearly supported by our results, as it is not until after the age of 6 years, that children spontaneously apply the display rules, and this is mediated by context. This age period, around 6 years, coincides with the acquisition of the display rules (Jones, Abbey & Cumberland, 1998), and also when Danish children enter main school. That is, it seems that the older children know the rules and (depending on the narrative context) can be very faithful to them.

The results of the *schadenfreude* studies that we present in the introduction, although they do not capture envy, in some cases coincide with the results obtained in our study. For example, one of the conditions of Shiverick and Moore's (2013) study is similar to the intentional condition in the present study: the intention is realized but the desire is not fulfilled. However, although they are in a similar direction, their results do not fully coincide with our results. In Shiverick and Moore's study, groups of children from 5 to 8 years of age attributed less sadness than 10-year-old children and adults. In our study we saw a clear change between the two age groups, with the younger group attributing more intense *schadenfreude* than the older ones in the intentional condition, which was not the case in Shiverick and Moore's study. This difference possibly is because in the stories showing the happy victimizer pattern the character suffers physical injury (e.g., he is pushed or falls). In our stories the damage is not directed towards the person but to his belongings. Thus, the damage observed in Shiverick and Moore's scenarios is more severe and therefore more apt to inhibit *schadenfreude* as in the irreparable condition of our study. The children in the Shiverick and Moore study were also slightly older than the children in our study, so a clear comparison cannot be made.

On the other hand, it is possible that older children simply apply the display rules more faithfully, which is why the intensity of *schadenfreude* is lower than that of young children. Yet another possibility of why children attribute *schadenfreude*, and which is the explanation we propose, has to do with the bringing an end to the inequality that may be seen as a threat to the Self. Shamay-Tsoory, Ahronberg-Kirschenbaum and Bauminger-Zviely (2014) indicate that *schadenfreude* could be due not only to the damage, but to the restoration of equality and the fact that the advantage lost by one of the characters becomes the possibility of obtaining it for the other. In stories of envy, the situation of initial

inequality is a critical element, and the subsequent purpose is to end this inequality. These authors documented *schadenfreude* in situations of rivalry, and where episodes of jealousy were presented, for example, a child watched his mother read a story to another classmate, which created jealousy, but this was ended when the child accidentally spilt a glass of water over the storybook, which stopped the mother from reading, and hence resulted in a disadvantage generating joy in the envier. Although there was no clear benefit, because the mother no longer read the book, the joy (or lack of distress) indicated that equality between rivals was restored. The same occurs in our study: although there is no clear benefit to the envier after the harm, the re-establishment of equality or the new possibility of gaining a psychological advantage might be reasons to attribute joy to the envier. To elucidate this question, and further develop the line of research advanced in this study, it would have been interesting to ask participants about why the character feels happy when he sees the envied object spoiled.

As regards gender differences, the interactions we obtained between gender and cause of harm were unexpected. In previous studies with children we did not find gender differences in relation to children's development of *schadenfreude* or envy. We therefore find our results showing that girls do not differentiate between the causes of damage they attribute to *schadenfreude*, while boys seem to attribute more emotional intensity (*schadenfreude*) when the damage is intentional interesting. It is possible that these differences may be due to processes of socialization, as pointed out by Brody (1985). Although other studies show that gender differences do not affect the identification of emotions (Waiden & Field, 1990), nevertheless van Dijk, Ouwerkerk, Goslinga, Nieweg and Gallucci (2006) found gender differences in the intensity of *schadenfreude* in adults, with male participants reporting greater intensity than female participants. Nevertheless, in order to address this issue more carefully, additional developmental studies are warranted.

The findings of this study, and in particular the fact that children do not acquire understanding of others' emotions in a social and interpersonal vacuum, has important implications for parents, teachers and practitioners. Emotion development is an area of particular interest to adults who are engaged in supporting young children's development, and it is therefore important they understand that the way young children conceptualize emotions may differ from how older children, or they themselves, conceptualize emotions. Furthermore, emotion understanding has become part of the curriculum of primary schools in several countries, and specific programs have been developed. The knowledge gained from our study is crucial information for developers of such programs, and also for teachers applying the programs. Finally, but of equal importance, practitioners working with children that follow atypical emotion development paths need to be aware of the nuances and complexities existing in typical developing children's emotion understanding and to integrate this knowledge in their support to children from special populations. In summary, our results may support professionals in their development of tools for working with typically developing as well as atypically developing children, but also parents in gaining a better understanding of their child's development. Practitioners should also be aware that this study investigates the

child's conceptual understanding of complex emotions that cannot be revealed through facial expressions, but are constituted within a myriad of interpersonal and mental interpretations presented within a specific scenario. Children's lexical-semantic development of complex emotions may however follow a different developmental trajectory.

CONCLUSIONS

This study reveals that in early development the emotional consequences of harm from an upward comparison vary depending on the severity of the harm, agency, and intentionality. Results show that when the damage is more severe and irreparable, weaker feelings of schadenfreude occur than when the damage is less severe and reparable. When the damage is accidental, schadenfreude is expressed with less intensity compared to when the damage is intentional. In addition, young children do not seem to take into account the severity of the damage in their evaluation of the intensity of schadenfreude. Older children on the other hand do evaluate the severity of the damage, and attribute more intense schadenfreude in conditions where the damage is reparable and caused accidentally.

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