



# Functions of the Jeugdjournaal App: A tool for children to cope with positive and negative news?

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## Abstract

Children can be strongly emotionally affected by news, and these emotions may hinder or stimulate children's (future) news consumption. More insight in how children can cope with these emotions elicited by news is, therefore, warranted. The NOS Jeugdjournaal app could be a promising tool to improve coping with positive and negative news via the interactive functions of the app. This research project aimed to investigate this. In Study 1, we explored the uses of online commenting on the NOS Jeugdjournaal app with an automated content analysis of 336,342 online comments. Results showed an average of 707 comments per news message with an average length of 44 tokens. Moreover, 22% of the children used the app to express emotions in their comments. In Study 2, an experiment was conducted among children (8-13 y/o,  $N = 319$ ) focusing on the effects of two coping strategies (reading comments of peers in the app and posting own comments) after consuming a positive or negative news message on children's emotional feelings. Findings did not show a difference between reading comments or writing a comment on emotional feelings. However, a post-hoc analysis revealed that length of the comments may play a role here: children who wrote a longer comment had a smaller decrease in positive emotions after watching negative news. Since children use the app to express emotions and preliminary findings indicate that the app might serve as a tool for coping, this research project establishes a good basis for future research of online news applications for children.

*Keywords:* children, news, online commenting, mobile applications, emotions

## Introduction

Children's consumption of and engagement with news are important prerequisites for their (future) participation in the public sphere (Alon-Tirosh & Lemish, 2014). In addition, following news during childhood and adolescence has positive effects on democratically valuable attitudes and behaviors, such as increased political knowledge and participation (Livingstone & Markham, 2008; York & Scholl, 2015). It is thus important to take children seriously as a target group for news (cf. Kleemans, De Leeuw, Gerritsen, & Buijzen, 2017a). Producers of news for children are faced with the challenge to provide suitable news content for a young audience, in which they take children's emotional feelings after consuming news into account. This is important because children are emotionally affected by what is presented in the news (cf. Kleemans et al., 2017a; Kleemans, Schlindwein, & Dohmen, 2017b; Valkenburg & Buijzen, 2008; Walma van der Molen, Valkenburg, & Peeters, 2002; Walma van der Molen & de Vries, 2003). While positive emotions experienced after consuming news may stimulate future news consumption (cf. Alon-Tirosh & Lemish, 2014), negative emotions elicited by news may hinder children's willingness to follow the news (cf. Kleemans et al., 2017a). Therefore, more insight into how children can cope with their emotions after consuming news is warranted.

In today's rapidly changing news media landscape, news producers are searching for new ways to engage children in news, while acknowledging their emotional sensitivities and needs (cf. Walma van der Molen & de Vries, 2003). The online application from the Dutch public service broadcaster NOS (the "NOS Jeugdjournaal app") is an example of this. To inform children between approximately 9 to 12 years old about news events in a suitable way, the app contains short news videos, written news, and statements about the news that children can react to. The interactive elements of the app provide children with the opportunity to share their own thoughts regarding the news and to read comments written by peers. Reading

comments of peers and commenting on news on the NOS Jeugdjournaal app may potentially serve as strategies for children to cope with their emotions after consuming news, possibly resulting in beneficial effects on children's emotion regulation. Scientific insight into this is, however, lacking, because children's online comments to news did not receive any research attention yet.

The aim of the current project is to investigate whether the app can function as a tool for children to cope with emotions elicited by positive and negative news. To this end, two studies will be conducted. This project first explores to what extent children *use* the NOS Jeugdjournaal app to express their emotions to both positive and negative news (Study 1). In Study 2, possible *effects* of online commenting on the NOS Jeugdjournaal app on children's emotions after exposure to positive and negative news are investigated.

### **Uses of online commenting**

Study 1 involves children's *uses* of online commenting on news. Among adults, past research already provided some insights into the uses of online news comments. In general, studies showed that only a relatively small proportion of users write their own comments to news, while a large majority only reads comments (Barnes, 2015; Ksiazek, 2016). Adult comments were found to be short, unstructured and contain irregular and informal sentences (Liu, Zhou, & Zhao, 2015). Those comments showed to serve as an opportunity for the adult reader of a news item to express sentiment, their opinion, a question, a rumor, or a call to action (Liu et al., 2015). In addition, a study of Barnes (2015) suggests that users are particularly motivated to comment on news stories that arouse emotion.

Earlier research among adults also showed that characteristics of news messages influenced the amount of comments on news messages (Abdul-Mageed, 2008; Ksiazek, 2016; Ksiazek, Peer & Lessard, 2016; Liu et al., 2015). For example, the topics of online news items

had an effect on the number of comments a news story received (Ksiazek, 2016; Liu et al., 2015). Political news topics – e.g., healthcare or gun control – received more comments than topics such as education or environment (Ksiazek, 2016). Next to the amount of comments, research also indicated that characteristics of news content can influence the valence of the comments, for example the hostility and (un)civility of comments (Coe, Kenski, & Rains, 2014; Ksiazek, 2016). Adults used more uncivil words for controversial topics, such as foreign policy and gun control than for economy or taxes.

In sum, past research provided insights into the characteristics of online comments on news posted by adults. Continuing on this research regarding the uses of online comments, the aim of Study 1 is to get more insight into how children comment on positive and negative news messages via the NOS Jeugdjournaal app and particularly whether they express emotions in their online comments.

### **Effects of emotional coping after news consumption**

Next, we will investigate the *effects* of online news commenting on children's emotional responses to see whether online commenting might serve as a strategy to cope with positive and negative news. In Study 2, we aim to shed more light on this.

Previous research mainly investigated emotional responses after consuming negative news, showing that children often experience negative emotions after exposure to news about negative events (Buijzen, Walma van der Molen, & Sondij, 2007; Kleemans et al., 2017a; Kleemans et al., 2017b; Valkenburg & Buijzen, 2008; Walma van der Molen et al., 2002). Those negative emotions can result in undesirable effects, such as anxiety-related behaviors (Buijzen et al., 2007; Cantor & Nathanson, 1996), and may lead to news avoidance (cf. Alon-Tirosh & Lemish, 2014; Kleemans et al., 2017a). Emotional responses after positive news, in contrast, did receive less research attention. In a focus group study conducted by Alon-Tirosh

and Lemish (2014) children requested the news to be more positive, entertaining and humorous. They asked for news with a more optimistic tone and for more positive news items in general, to overcome scary news. This indicates that news is also able to elicit positive emotions, namely if it reports about positive events. Because this may stimulate children's future news consumption (cf. Alon-Tirosh & Lemish, 2014), positive news and children's emotional responses to such news should receive more research attention amid the predominant attention for negative news.

Valkenburg and Buijzen (2008) describe three pathways that explain the elicitation of negative emotions via news, but one might expect that positive emotions are elicited in comparable ways. The first path is via direct experience: during exposure to news children directly experience emotions in the same way as they become, for instance, happy or frightened by real-life experiences. For example, when a child is afraid of spiders, he/she will feel the same fear when seeing a spider in the news. Second, via observational learning: children observe emotional reactions of others shown in the news, and this may increase their own emotions in comparable ways. For example, a child crying in the news can evoke sadness in the child who is watching the news. Third, via information transfer. This overlaps with observational learning, but particularly involves information presented by news anchors, news correspondents or eyewitnesses, which evokes the emotion.

Because of the impact news has on children's emotions, more insight into how children can cope with these emotions is necessary. As already mentioned in the introduction, the interactive functions of the NOS Jeugdjournaal app (i.e., reading comments made by peers or commenting on news) may be beneficial in this regard. Walma van der Molen and De Vries (2003) provide an argument for this expectation by presenting a framework of consolation strategies that can be used in child (television) news to affect children's emotional responses to news. Besides strategies such as alternating heavy and light news or the

avoidance of violent pictures, they propose the use of a strategy called ‘paying attention to the reactions of viewers’. This strategy means that news producers include reactions of non-involved children in news to show how other children try to cope with their (negative) emotions (Walma van der Molen & de Vries, 2003).

Social identity theory (Tajfel, 1978) provides an explanation for the potential effectiveness of this consolation strategy. This theory defines group identification as the degree to which people see themselves as a member of the group and the degrees of value and emotional attachment to this group (Hewstone, Stroebe, & Jonas, 2015, p. 459). If children identify themselves with non-involved children shown in news, it may relieve them to see how the children they identify with cope with their emotions. Translating this idea to an app-environment, we can assume that children also identify themselves with other children who use the app environment. Therefore, reading (emotional) comments given by non-involved children via the NOS Jeugdjournaal app (defined in the current study as the ‘passive coping strategy’) may help children to cope with their emotions.

Children could also more actively cope with news, by writing a comment on the news message themselves. This ‘active coping strategy’ is assumed to be even more beneficial than reading comments of other children, because writing a comment can be seen as a way of emotion regulation, aiming to decrease negative emotions and/or increase positive emotions (Gross, 1998). Writing about (emotional) experiences may help, because it affords the child with the opportunity to gain a sense of mastery of the own emotions and to write off emotional thoughts. A study on short writing assignments (Burton & King, 2008) found that even writing for two minutes already has beneficial psychological health outcomes. This implies that even if children impress their thoughts and feelings in a short way, this might contribute to emotion regulation. The commenting function of the NOS Jeugdjournaal app

may thus serve as an innovative tool for children to cope actively with emotions after consuming news.

### **The current research project**

In all, this research project focuses on the overarching question whether the NOS Jeugdjournaal app can help children to cope with positive and negative news. The first study, which is explorative in nature, investigates children's comments on news messages in a natural setting. To this end, we collected the comments made by children on the NOS Jeugdjournaal app during a one-year period to get a general overview of whether and how children comment on positive and negative news messages. Because of our interest in emotional coping, we pay particular attention to the question whether they express emotions in their online comments. The second study, with an experimental set-up, focuses on the effects of the passive and active strategy on children's emotional responses to positive and negative news.

### **Study 1**

To fill in the gap regarding the uses of children's online comments to news, Study 1 investigates whether and how children comment on news messages via the NOS Jeugdjournaal app. Since this is the first study that focuses on comments made by children on news websites, it is exploratory in nature. As a first step, it is relevant to get a general idea of the amount of comments children post, the length of their comments and which topics they react to. Therefore, the first research question is:

RQ1: What is the amount and length of children's comments on positive and negative news on the NOS Jeugdjournaal app?

Next, it is interesting to focus on the content of the comments. Earlier research among adults indicated that comments provide users with the opportunity to express sentiment or their opinion to a news item (Liu et al., 2015), and that expressing their emotional responses can serve as a motivation to comment on news messages (Barnes, 2015). Because of the impact that news has on emotions of children (cf. Kleemans et al., 2017a; Kleemans et al., 2017b; Valkenburg & Buijzen, 2008; Walma van der Molen et al., 2002), we are particularly interested in the question whether their comments include emotional expressions. Therefore, as a second step we ask the following research question:

RQ2: To what extent do children express emotions in their online comments on positive and negative news messages?

Finally, we will investigate the role of message characteristics with regard to the elicitation of (emotional) comments, because earlier research among adults showed that characteristics of news messages influence the amount (Abdul-Mageed, 2008; Ksiazek, 2016; Ksiazek et al., 2016; Liu et al., 2015) and valence of comments (Coe et al., 2014; Ksiazek, 2016). For this study, we are interested in how news characteristics predict comments containing emotional responses from children. For example, are there characteristics such as valence, heavy or light news, or topic that cause more emotional expressions in children's comments? Therefore, as a third step we examine the following research question:

RQ3: How do characteristics of news messages predict children's online (positive and negative) emotional expressions?

## Method Study 1

To answer our research questions, a data set with children's comments to news messages from the NOS Jeugdjournaal app was analyzed. First, a manual content analysis was conducted to classify the valence of the news messages that received comments from children. Second, to analyze the comments of the positive and negative news messages, two automated content analysis techniques – sentiment analysis and counting (Boumans & Trilling, 2016) – were conducted with a script written in Python.

### Data and classification

A list of all news messages that included comments from September 1<sup>st</sup> 2016 till August 31<sup>st</sup> 2017 was manually retrieved from the NOS Jeugdjournaal online environment. This list contained 653 news messages. We only wanted to include positive and negative news messages (and thus no neutral news messages) in our sample, and therefore a manual content analysis was conducted to code this list on valence (positive, negative, neutral). For valence, we looked at the nature of the topic that was central in the news message. A news message was coded as positive when the nature of the central topic of the news message was positive (e.g., 'Lola and Sophie got a letter from the pope'); neutral when the nature of the central topic of the news message was neutral (e.g., 'Politicians want faster internet'); and negative when the nature of the central topic of the news message was negative (e.g., 'Terroristic attack with van in Barcelona'). First, 66 messages (10%) were used to train the two researchers involved in the data collection. After this training phase, another 66 messages (10%) of the list were double coded to obtain intercoder reliability. The SPSS Macro van Hayes (Hayes & Krippendorff, 2007) was used to calculate Krippendorff's alpha. Double coding of valence of the news messages was reliable ( $\alpha = .74$ , agreement percentage = 83%). Therefore, one of the researchers coded the valence of remaining news messages.

The total amount of positive and negative news messages was 478 (73%), resulting in the ‘news messages data set’ for Study 1. We received a csv file from the NOS Jeugdjournaal with 336,342 online comments (the ‘comments data set’) from 476 news messages (2 news messages were missing due to an inconsistency in the URLs in the list given to the NOS Jeugdjournaal). In total, there were comments to 325 positive news messages and 151 negative news messages.

In order to answer RQ2, focusing on characteristics of news messages, the positive and negative news messages were manually coded on two additional characteristics next to valence: topic and whether the news was heavy or light. For *topic*, the news message could be classified into one out of fifteen categories that are present in news for children. Those topics were derived from previous research from Alon-Tirosh and Lemish (2014) who interviewed children about topics in the news and from past studies on the content of news in general (e.g., Kleemans, van Cauwenberge, d’Haenens, & Hendriks Vettehen, 2008). Topics were: (1) political news, (2) financial news, (3) world problems, (4) violence and crimes, (5) disasters (e.g., a fire), (6) culture, media and celebrities, (7) sports and leisure, (8) animals, (9) nature and environment, (10) education, (11) science and technology, (12) health, (13) prosocial behavior, (14) remaining positive/funny news, (15) other topics.

For *heavy and light news*, based on Walma van der Molen and De Vries (2003) news messages were coded as heavy when they covered a serious topic, such as politics, financial news, world problems, education (problems), violence and crimes, or disasters. An example of a heavy news message is a news message about the war in Syria. Light news messages were coded when they met the following description: light news messages usually cover positive or weird events about children or animals and are meant to take off the weight of heavy news items. They have less news value than heavy news messages: they are less

important and sometimes not even real news. For example, the news message “Man and kangaroo are best friends” was coded as light news.

For both topic and heavy/light news, 12 messages were used as training materials for the two researchers. Afterwards, another 48 messages (10%) were double coded to obtain intercoder reliability. Double coding of the news messages was reliable for topic and heavy/light news ( $\alpha = .92$ , agreement percentage = 92%;  $\alpha = .92$ , agreement percentage = 96%, respectively). One of the researchers coded the remaining items. The classification of topic and heavy/light news was added to the news message dataset.

### **Data Processing**

The comments data were processed with a script written in Python 3. First of all, the comments were cleaned by removing HTML tags punctuation and double spaces, and by converting all comments to lower case. To get a general idea of children’s opinion, we used sentiment analysis from the package ‘pattern.nl’ in Python (Geertzen, 2010; de Smedt & Daelemans, 2012). For each comment, the sentiment analysis automatically provides a value for polarity between -1.0 (most negative) and +1.0 (most positive).

Moreover, we were interested in which words children used most and whether there were any emotion words among these. We, therefore, used a counting approach (Boumans & Trilling, 2016). First, we used ‘Counter’ from the package collections to get an overview of the 50 most frequently used words in our dataset. From this list, all words referring to emotions were taken. We classified these words into four categories: emotions words in general, positive emotion words, negative emotion words, and extent of the emotion (i.e., words that indicate how strong children feel something, for example ‘really’). Table 1 shows an overview of the words in each category. A function was written to calculate a score for each comment on each category. Scores were computed by counting how many times a word

from the category occurred in the comments. This led to a total score on each category for each comment.

**Table 1.** Overview of categories of counting approach

<b>Category</b>	<b>Words in category</b>
Emotion words in general	Nice, good, cool, funny, stupid, pathetic, scary, boring
Positive emotion words	Nice, good, cool, funny
Negative emotion words	Stupid, pathetic, scary, boring
Extent of the emotion	Very, really, bad, super, sometimes, little

### **Data Analysis**

Data were analyzed in R. First, the news messages data set and the comments data set were merged, matching the news message characteristics to each comment regarding this message. The first research question was answered by investigating descriptive statistics of the number of comments. To answer the second research question, descriptive statistics of the sentiment analysis and the four count categories were investigated.

In order to answer the third research question, we ran negative binomial regression models. The four count categories were used as separate dependent variables. They followed a count distribution, which is characterized by being right-skewed and only consisting of positive integers (Trilling, Tolochko, & Burscher, 2017). Moreover, negative binomial regression analysis was chosen over Poisson regression analysis (which is also commonly used for count models), because the standard deviations of the dependent variables were much higher than the means (Gardner, Mulvey, & Shaw, 1995; Trilling et al., 2017).

### **Results Study 1**

To answer RQ1, we provide a short overview of the amount of comments children post, and the length of these comments. The descriptive statistics show that positive news

messages received on average slightly more comments per news message than negative news messages. Comments on negative news messages were longer than those on positive news (See Table 2 for an overview on average length and amount of comments). Furthermore, descriptive statistics for topic yielded that *financial news* received most comments on average ( $M = 844$ ), followed by *culture, media and celebrities* ( $M = 831$ ) and *violence and crimes* ( $M = 791$ ). For a complete overview of descriptive statistics per topic, see Appendix 1.

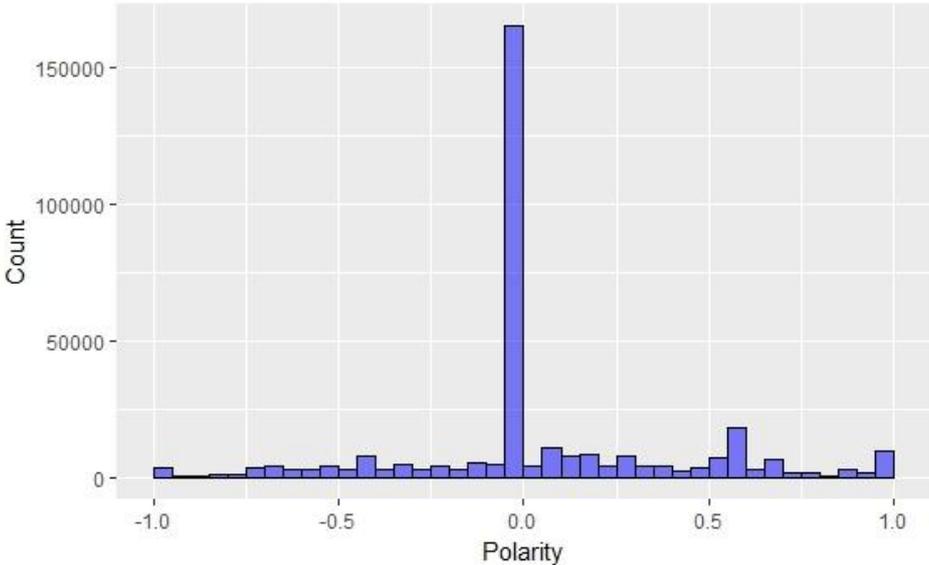
**Table 2.** Descriptive statistics of Comments data set

Variable	Min	Max	<i>M</i>	<i>SD</i>
<b>All news messages together (<math>n = 476</math>)</b>				
Number of comments	78	4,523	707	554
Length of comments	0	1,297	43.69	44.59
<b>Positive news messages (<math>n = 325</math>)</b>				
Number of comments	78	3,555	709	514
Length of comments	0	1,131	40.54	41.56
<b>Negative news messages (<math>n = 151</math>)</b>				
Number of comments	137	4,523	703	634
Length of comments	0	1,297	50.52	49.88

To investigate to what extent children express emotions in comments on positive and negative news messages (RQ2), we looked at the descriptive statistics of the sentiment analysis and the results of the counting approach. For the sentiment analysis, the scores on polarity indicated how positive or negative the comments were. The descriptive results showed that comments are quite neutral on average ( $M = 0.07$ ,  $SD = 0.37$ ,  $Min = -1$ ,  $Max = 1$ ). Figure 1 shows the distribution of polarity, with on the x-axis how positive or negative a comment is (-1 is most negative, + 1 is most positive) and on the y-axis the frequency. The distribution indicates that there are more positive comments than negative comments. Furthermore, Figure 1 suggests that the level of positivity for positive comments is higher

compared to the level of negativity of the negative comments, because the frequency bars between 0.5 and 1.0 are higher compared to the bars between -1.0 and -0.5.

Results from the counting approach yield that approximately 1 in 5 comments contained one or more emotion words, since 74,905 comments did contain any of the words in the emotion words category (22%) and 261,437 comments did not. According to the descriptive statistics, children used more positive words (e.g., “good”, “nice”, “funny”) ( $M = 0.20$ ,  $SD = 0.46$ ) than negative words (e.g., “stupid”, “scary”, “boring”) ( $M = 0.06$ ,  $SD = 0.27$ ) in general.



**Figure 1.** Distribution of Polarity in children’s comments on positive and negative news messages. *Note.* Histogram indicates how negative/positive comments are. Polarity scores range between -1.0 (most negative) and 1.0 (most positive).

In order to investigate how news characteristics can predict emotional expressions (RQ3), we ran four negative binomial regression models. In Table 3 and 4 the incidence rate ratios (IRRs) for the four models are displayed. The IRRs indicate the increase or decrease of the expected count of the dependent variable when the independent variable increases with one unit. The expected count has to be multiplied by the IRR when the independent variable increases by one unit (Trilling et al., 2017). For example, an IRR of 1.25 means that a one unit

increase leads to 125% emotion words, whereas an IRR of 0.80 means that a one unit increase leads to 80% emotion words. In this study categories are compared with each other, meaning that an IRR above 1.00 indicates an increase compared to the reference category, while an IRR below 1.00 indicates a decrease compared to the reference category.

For emotion words in general (both positive and negative emotion words), there were 1.25 times as many emotion words used when the news message was positive ( $p < .001$ ), meaning that the amount of emotion words was higher for positive than for negative news. Light news messages received 1.43 times as many emotion words ( $p < .001$ ) as heavy news messages, implying that light news messages received more emotional expressions from children. For topic, the topic *culture, media, and celebrities* was used as the reference level. This reference level was chosen, because descriptive statistics showed high scores for this topic on emotion words, easing the interpretation of the results of the negative binomial models. Only for the topic *violence and crimes* the amount of emotion words was 1.27 times higher ( $p < .001$ ). Most emotion words were thus used in comments on news about *violence and crimes*, followed by news about *culture, media and celebrities* and *prosocial behavior*. For all other topics, significantly less emotion words were used (see Table 3).

For positive emotion words, 1.43 times as many positive emotion words were used when the news was positive ( $p < .001$ ), meaning that positive news messages received more positive emotion words. A light instead of heavy news message led to 1.10 times more positive emotion words ( $p < .001$ ), implying that light news messages received more positive emotion words than heavy news messages. For topic, the topic *culture, media and celebrities* was again used as the reference level. The amount of positive emotion words was significantly lower for all other topics, indicating that the topic *culture, media and celebrities* received most positive emotional expressions from children, see Table 3.

**Table 3.** Negative binomial regression predicting use of emotion words and positive emotion words

<b>Independent Variables</b>	<b>Emotion Words</b>	<b>Positive Emotion Words</b>
News valence	1.248*** [0.237, 0.246]	1.431*** [1.397, 1.467]
Heavy/Light News	1.143*** [1.120, 1.275]	1.103*** [1.078, 1.128]
Topic		
Political news	0.726*** [0.674, 0.781]	0.715*** [0.657, 0.775]
Financial news	0.541*** [0.502, 0.583]	0.646*** [0.597, 0.698]
World problems	0.799*** [0.711, 0.894]	0.838** [0.735, 0.952]
Violence and crimes	1.269*** [1.231, 1.308]	0.750*** [0.719, 0.781]
Disasters	0.671*** [0.600, 0.748]	0.495*** [0.429, 0.569]
Sports and leisure	0.737*** [0.722, 0.751]	0.757*** [0.741, 0.774]
Animals	0.778*** [0.753, 0.802]	0.621*** [0.597, 0.645]
Nature and environment	0.348*** [0.328, 0.368]	0.321*** [0.300, 0.342]
Education	0.625*** [0.604, 0.647]	0.646*** [0.622, 0.671]
Science and technology	0.667*** [0.610, 0.727]	0.680*** [0.617, 0.747]
Health	0.329*** [0.304, 0.355]	0.365*** [0.335, 0.397]
Prosocial behavior	0.969 [0.927, 1.013]	0.881*** [0.837, 0.927]
Remaining positive/funny news	0.588*** [0.567, 0.609]	0.649*** [0.624, 0.674]
Other topics	0.368*** [0.346, 0.391]	0.323*** [0.300, 0.348]
$\Theta$	5.132 (0.257)	5.387 (0.357)
AIC	420,007	354,305

*Note.* IRRs with confidence intervals in brackets. Values < 1 indicate a negative effect, values > 1 indicate a positive effect. AIC = Akaike information criterion; IRRs = incidence rate ratios.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

For negative emotion words, 0.81 times as many negative emotion words were used when the news message was positive ( $p < .001$ ), meaning that the amount of negative emotion words was higher for negative news than for positive news. A light news message led to 1.26 times as many negative emotion words ( $p < .001$ ), implying that children used more negative emotion words when responding to light news messages than to heavy news messages. For

topic, the topic *violence and crimes* was used as the reference level to ease interpretation. The amount of negative emotion words was significantly lower for all other topics, meaning that the topic *violence and crimes* received most negative emotional expressions from children (see Table 4).

**Table 4.** Negative binomial regression predicting use of negative emotion words and the extent of the emotion.

<b>Independent Variables</b>	<b>Negative Emotion Words</b>	<b>Extent of the Emotion</b>
News valence	0.808*** [0.773, 0.845]	0.745*** [0.728, 0.762]
Heavy/Light News	1.264*** [1.207, 1.323]	0.869*** [0.849, 0.889]
Topic		
Culture, media and celebrities	0.354*** [0.336, 0.373]	0.743*** [0.720, 0.766]
Political news	0.267*** [0.226, 0.314]	0.801*** [0.743, 0.863]
Financial news	0.063*** [0.047, 0.081]	0.684*** [0.640, 0.731]
World problems	0.248*** [0.193, 0.315]	0.535*** [0.475, 0.601]
Disasters	0.476*** [0.395, 0.569]	0.404*** [0.354, 0.460]
Sports and leisure	0.227*** [0.213, 0.242]	0.685*** [0.661, 0.709]
Animals	0.493*** [0.458, 0.530]	0.581*** [0.553, 0.610]
Nature and environment	0.162*** [0.142, 0.183]	0.373*** [0.350, 0.397]
Education	0.190*** [0.174, 0.207]	0.649*** [0.623, 0.676]
Science and technology	0.207*** [0.163, 0.258]	0.626*** [0.652, 0.695]
Health	0.075*** [0.061, 0.091]	0.647*** [0.612, 0.684]
Prosocial behavior	0.476*** [0.430, 0.527]	0.626*** [0.586, 0.668]
Remaining positive/funny news	0.110*** [0.097, 0.125]	0.657*** [0.624, 0.691]
Other topics	0.186*** [0.166, 0.208]	0.581*** [0.552, 0.613]
⊖	0.5916 (0.022)	0.681 (0.009)
AIC	147,710	411,831

*Note.* IRRs with confidence intervals in brackets. Values < 1 indicate a negative effect, values > 1 indicate a positive effect. AIC = Akaike information criterion; IRRs = incidence rate ratios.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

For the category extent of the emotion, a positive news message led to 0.75 times as many words that indicate how strong children felt the emotion ( $p < .001$ ), meaning that for negative news more words to express the extent of the emotions, such as ‘really’ or ‘very’ were used. Light news messages received 0.87 times as many words in this category ( $p < .001$ ), implying that heavy news messages received more words to express the extent of the emotions. For topic, the topic *violence and crimes* was again used as the reference level. For all other topics the number of words that indicated the extent of the emotion was significantly lower, meaning that news messages on the topic *violence and crimes* received most comments with words indicating how strong children felt the emotion (see Table 4 for an overview).

## Study 2

After receiving insights into the uses of online comments in Study 1, the next step is to investigate the effects of online comments (reading comments of other viewers in the app environment and posting own comments) on children’s emotions. We will investigate this in two steps. First, a *baseline study* will be conducted to investigate whether there are any effects of positive and negative news videos on the emotions of children. In this way, we get a general idea of how children respond to the particular news videos we will use as material in this study. This is particularly interesting because the effects of positive news on children’s emotions are not experimentally investigated before. Then, we will conduct the *main study* to investigate the difference between the passive strategy (reading comments of other children) and the active strategy (posting a comment) after children watched either the positive or negative news video.

As a first step, the baseline study thus focuses on the effects of the news videos on children’s emotional responses. One might expect that positive news evokes higher levels of positive emotions and negative news evokes higher levels of negative emotions via the three

pathways (direct experience, observational learning and information transfer) as Valkenburg and Buijzen (2008) described. Therefore, we hypothesize that:

H1: After watching the positive news video children's positive emotions will increase (H1a) and negative emotions will decrease (H1b).

H2: After watching the negative news video children's negative emotions will increase (H2a) and positive emotions will decrease (H2b).

As said, previous research particularly focused on children's emotional responses after negative news (Buijzen et al., 2007; Kleemans et al., 2017a; Kleemans et al., 2017b; Valkenburg & Buijzen, 2008; Walma van der Molen et al., 2002). This focus on negative news messages and emotions may represent a public concern about the effects of negative news on children, while positive news is not assumed to be harming and thus less investigated. Derived from this, it is likely that negative news videos have a stronger impact on children's emotional feelings than positive news videos, and therefore we hypothesize that:

H3: The negative news video has a stronger impact on children's emotions than the positive news video: Children who watch the negative news video will have a stronger change in negative emotions (H3a) and a stronger change in positive emotions (H3B) than children who watch the positive news video.

As a second step, the main study investigates whether the passive and active coping strategy have an effect on children's emotions after watching either the positive or negative news video. Because the active strategy can be seen as an active way of emotion regulation, aiming to decrease negative emotions and/or increase positive emotions (Gross, 1998), we expect the active strategy to be more beneficial than the passive strategy. For the main study we thus hypothesize:

- H4: After watching a positive news message, children who are instructed to write a comment on the app will have a larger decrease in negative emotions (H4a) and a larger increase in positive emotions (H4b) than children who are instructed to read comments of other children.
- H5: After watching a negative news message, children who are instructed to write a comment on the app will have a smaller increase in negative emotions (H5a) and a smaller decrease in positive emotions (H5b) than children who are instructed to read comments of other children.

## **Method Study 2**

For Study 2, two experiments (baseline study and main study) were conducted. Both studies were between-subjects experiments, used the same news videos, had a similar procedure and were both conducted in March 2018 among children in grades 4, 5, and 6 of three primary schools in The Netherlands. This research project, including its consent procedure, received approval of the Ethics Committee of the Faculty of Social Sciences, Radboud University (file no. ECSW2017-029).

### **Participants**

For both studies, we first obtained active consent from the head of each school. Then, a letter with a description of the study and a request to give passive consent was distributed among the parents of the children two weeks before the studies took place. In this letter, it was further stressed that all information would be treated anonymously and confidentially. In the main study, two parents did not allow their children to participate. On the day of the data collection active consent of the children was obtained.

**Baseline study.** For the baseline study, two children did not want to participate. In total, 82 children participated (53 girls and 29 boys). Their age ranged between 8 and 13 years old ( $M = 10.55$ ,  $SD = 1.09$ ). Almost all participants were born in The Netherlands (97.6%); two children were born in other countries. Children from grade 4 (34.1%), grade 5 (29.3%) and grade 6 (36.6%) participated.

**Main study.** For the main study, all children wanted to participate. However, 13 children did not participate because they were not present in the classroom during the experiment. The sample consisted of 237 children, 115 girls and 122 boys. Their age ranged between 8 and 12 years old ( $M = 10.76$ ,  $SD = .87$ ). Almost all participants were born in The Netherlands (94.5%); 13 children were born in other countries. Children from grade 4 (17.3%), grade 5 (40.9%) and grade 6 (41.8%) participated.

## Measures

To measure emotions before and after exposure to the news videos, children were asked to indicate how they felt at that moment. Four primary emotions (see Keltner, Oatley, & Jenkins, 2014) – joy, anger, sadness and fear, and in addition a synonym for all these emotions (respectively happiness, madness, sorrow and anxiety; see Kleemans et al., 2017a; Kleemans et al., 2017b) were included to measure the emotional responses of the children. For each emotion, children responded on a visual analogue scale (VAS). An emoticon representing the emotion was displayed at the right end point, and on the left end point the same emoticon was displayed but with a red cross through it representing the lack of an emotion (Kleemans et al., 2017a; 2017b). Before the start of the experiment, we practiced this question with an example of a “sleepy emoticon”, to ensure that all children understood how to respond to these questions. Children were asked where to draw the bullet on the scale (on

the tablet) when they were very tired (i.e., right side of the scale), not very tired but also not full of energy (middle of the scale), or full of energy (left side of the scale).

### *Constructing variables for positive and negative emotions*

To construct variables for positive and negative emotions, we first calculated the difference between emotional responses before and after exposure to the news video. Then, we conducted principal component analyses (PCAs) for the change in both the two positive emotions and the six negative emotions. For both the baseline study as well as the main study, the Kaiser–Meyer–Olkin measure verified sampling adequacy for both positive emotions and negative emotions, because it was 0.50 or larger. Moreover, Bartlett’s test of sphericity was significant in all cases ( $p < .001$ ), indicating that the correlations between the items were large enough to conduct the PCAs. The criteria of eigenvalues  $>1$  and component loadings  $>.60$  were met (Kline, 1994), yielding one component for each PCA. Lastly, Cronbach’s  $\alpha$  yield sufficient results for each PCA, ranging between  $\alpha = .73$  and  $\alpha = .91$ . Therefore, the variable *positive emotions* was constructed by calculating a mean score on the change in happy and joyful items. The variable *negative emotions* was constructed by calculating a mean score on the items indicating the change in how angry, mad, sad, sorrowful, scared, and anxious children felt.

## **Materials**

**Positive and negative news videos (baseline and main study).** From the database of news messages analyzed in Study 1 a positive and a negative news video were selected to use as stimulus materials in Study 2. The following selection criteria were applied: Firstly, both videos were showed on the NOS Jeugdjournaal app because we wanted the experiment to resemble the real world, and thereby increase ecological validity. Second, the news videos

were at least one year old (December 2016) and were not too salient, because we did not want children to have very living memories of the news. Third, the videos had to be suitable for both girls and boys, because we did not want to cause any effects on emotions because either boys or girls would not like the specific topic. Lastly, the videos included a question with suitable comments, because comments that were posted on the news videos were used for the reading condition in the main study as described below. Based on these criteria, a video about jumping on trampolines in a trampoline park was selected as positive news. For negative news, a video about the war in Syria was selected. Both videos were comparable in length and structure (2 min and 21 s, and 2 min and 15 s, respectively).

**Passive coping strategy (main study only).** The passive coping strategy was operationalized by asking children to read ten selected comments of other children that were posted in answer to the questions that accompanied the positive and negative news video on the NOS Jeugdjournaal app. The comments used were selected out of the 1,220 comments for the positive news video and the 1,336 comments for the negative news video that were originally posted. To select these comments, for both news videos all posted comments were read. The ten chosen comments represented the general tendency of all the comments on the news messages. This general tendency was determined by running a counting model with unigrams and bigrams for each news video separately. Based on these models the ratio of comments that agreed and disagreed (e.g., yes or no) was established as well as the ratio of comments that varied in the extent of the opinion (e.g., children who said they were really worried or they really liked jumping on trampolines versus children who said they were not that worried, or they did not really like jumping on trampolines).

For the positive news video this resulted in eight comments (~ 78%) that were in favor of trampolines, and two comments (~ 22%) that were not enthusiastic about jumping on trampolines. For the negative news video this resulted in nine comments (~ 90%) in which

children said they were (really) worried about the war in Syria, and one comment (~ 10%) in which a child said not being worried about the war in Syria. The selected comments can be found in Appendix 2. To stimulate children to read the comments carefully, the arrow to go to the next question in the online questionnaire was made available after one minute.

**Active coping strategy (main study only).** The active coping strategy was operationalized by giving children the following instruction: “You just saw a news message from the Jeugdjournaal. Via the app of the NOS Jeugdjournaal children can respond to a statement about the news they have seen. We want to ask you to do this as well. Read the question below about the news message you just saw, and write down your comment.” For the positive news video the question was: “Do you ever go jump on a trampoline?” For the negative news video this question was: “Are you worried about the war in Syria?” For both conditions a timer was built in the questionnaire, measuring the response time of the child. Moreover, the arrow to go to the next question was made available after one minute, stimulating children not to rush through the question but think about their response.

## **Procedure**

**Baseline study.** Data were collected in classrooms, using tablets. Children were randomly assigned to the positive news ( $n = 39$ ) or negative news ( $n = 43$ ) condition, by randomly distributing the tablets containing either the positive or negative news video. Each child received a tablet with headphones to participate.

After a short introduction to the whole group, children individually filled out the pre-exposure questionnaire on the tablet – including their demographic characteristics and their emotional state at that moment. Then, they watched the positive or negative news video on the tablet. Lastly, they were asked to fill out the post-exposure questionnaire measuring their emotional responses. Afterwards, children were thanked and debriefed.

**Main study.** The procedure was similar to the procedure of the baseline study. There were two differences: First, children were now assigned to one of the four conditions: positive – reading ( $n = 58$ ), positive – writing ( $n = 59$ ), negative – reading ( $n = 57$ ), negative – writing ( $n = 63$ ), again by randomly distributing the tablets that had one of the four conditions on them. Second, after children watched the positive or negative news video on the tablet, they were asked to either type a comment to the news message on the tablet or to read ten comments of other children on the tablet.

### **Analysis procedure**

**Baseline study.** Data were analyzed in SPSS. One sample t-tests were used to test if the increase or decrease in positive and negative emotions significantly differed from zero (H1a, H1b, H2a, and H2b). To investigate whether the change in negative and positive emotions was stronger for the negative news video than for the positive news video (H3a and H3b), independent t-tests for positive and negative emotions separately were carried out (for an overview, see Table 5).

**Main study.** Data were analyzed in SPSS. Descriptive statistics of the dependent variables (i.e., positive emotions and negative emotions, see Table 5) yield that the variances between the positive and negative news video largely differed. Moreover, especially in the positive news video conditions, the data were skewed and kurtosed. Nevertheless, we still used ANOVA because it is robust to violations of skewness and kurtosis when the sample size is above 30 participants (Glass, Peckham, & Sanders, 1972; Lumley, Diehr, Emerson, & Chen, 2002; Leys & Schumann, 2010). The data of the positive news video and the negative news video were thus analyzed separately, because the variances between the positive and negative news video differed too much to analyze together (assumption of homogeneity of

variance, Tabachnick & Fidell, 2007), and we were only interested in the differences in emotional changes between the reading and writing conditions (see Hypotheses 4 and 5).

Earlier research indicated that gender and age could be covariates, because girls and younger children showed to respond differently (more frightened) than older children to negative news messages (e.g., Kleemans et al., 2017a). Correlations for positive and negative emotions with gender and age were, therefore, investigated (Tabachnick & Fidell, 2007). Age did not have significant correlations with positive or negative emotions ( $r = -0.02, p = .740$ ;  $r = -0.04, p = .575$ , respectively), and gender did not as well ( $r = 0.07, p = .292$ ;  $r = -0.11, p = .095$ , respectively). Thus, age and gender were not included as covariates.

**Table 5.** Descriptive statistics of baseline study and main study

<b>Variable</b>	<b>Min</b>	<b>Max</b>	<b><i>M</i></b>	<b><i>SD</i></b>	<b>Var</b>	<b>Skewness</b>	<b>Kurtosis</b>
<b>Baseline study</b>							
<i>Positive news video</i>							
Positive Emotions	-42.00	50.00	1.74	15.38	236.64	0.51	4.35
Negative Emotions	-17.50	27.00	-0.74	2.53	31.43	0.38	17.80
<i>Negative news video</i>							
Positive Emotions	-84.00	33.50	-20.19	29.94	896.25	-0.43	-0.58
Negative Emotions	-8.67	70.00	16.55	22.37	500.51	0.90	-0.49
<b>Main study</b>							
<i>Positive news video</i>							
Positive Emotions	-50.00	47.00	2.44	11.91	141.81	-0.50	5.20
Negative Emotions	-15.00	51.33	-1.90	7.78	60.51	3.67	21.77
<i>Negative news video</i>							
Positive Emotions	-99.50	46.00	-15.48	27.92	779.41	-0.93	0.52
Negative Emotions	-21.50	85.83	13.62	22.61	511.09	1.28	0.76

## Results Study 2

**Baseline study.** Hypothesis 1 predicted an increase in positive emotions (H1a) and decrease in negative emotions (H1b) after watching the positive news video. However, the one-sample t-test revealed that positive emotions did not significantly increase after watching the positive video ( $p = .483$ ,  $M = 1.74$ ,  $SD = 15.38$ ) and negative emotions did not significantly decrease ( $p = .415$ ,  $M = -0.74$ ,  $SD = 5.61$ ), thus hypothesis 1 was not supported. Children's emotions did not significantly change after they watched the positive news video.

Hypothesis 2 predicted an increase in negative emotions (H2a) and a decrease in positive emotions (H2b) after watching the negative news video. The one-sample t-test revealed that negative emotions significantly increased after children watched the negative video ( $p < .001$ ,  $M = 16.55$ ,  $SD = 22.37$ ), and positive emotions significantly decreased ( $p < .001$ ,  $M = -20.19$ ,  $SD = 29.94$ ). These results confirmed our hypothesis that the negative news video made children feel more negative, and less positive shortly after watching the negative news video.

Hypothesis 3 predicted a stronger change in negative emotions (H3a) and a stronger change in positive emotions (H3b) for children who watched the negative news video. The results revealed that the negative emotions of children who watched the negative news video changed more ( $M = 16.55$ ) than the negative emotions of children who watched the positive news video ( $M = -0.74$ ),  $t(47.77) = 4.902$  ( $p < .001$ ). Furthermore, the positive emotions of children who watched the negative news video changed more as well ( $M = -20.19$ ) than the emotions of children who watched the positive news video ( $M = 1.74$ ),  $t(64.02) = -4.227$  ( $p < .001$ ). These results imply that the negative news video had a stronger impact on children's emotional responses than the positive news video.

**Main study.** Hypothesis 4 predicted a larger decrease of negative emotions (H4a) and a larger increase of positive emotions (H4b) for children instructed to write a comment on the

app after consuming a positive news message compared to children who were instructed to read comments of other children after consuming a positive news message. The analysis did not yield a significant main effect for negative emotions between the reading ( $M = -0.42$ ,  $SD = 7.28$ ) and writing condition ( $M = -0.03$ ,  $SD = 8.30$ ),  $F(1, 115) = .097$ ,  $p = .756$ ,  $\eta^2 = .001$ . For positive emotions there was also no significant main effect between the reading ( $M = 0.10$ ,  $SD = 11.47$ ) and writing condition ( $M = 3.91$ ,  $SD = 12.25$ ),  $F(1, 115) = 1.807$ ,  $p = .181$ ,  $\eta^2 = .015$ . These results imply that for positive news there was no difference in the change in positive and negative emotions between children who were instructed to read comments of other children and children who were instructed to write a comment.

Hypothesis 5a predicted a smaller increase of negative emotions (H5a) and a smaller decrease of positive emotions (H5b) for children who were instructed to write a comment after consuming a negative news message compared to children who were instructed to read comments of other children. However, the analysis revealed that there was no significant main effect for negative emotions between the reading ( $M = 11.63$ ,  $SD = 21.66$ ) and writing condition ( $M = 15.43$ ,  $SD = 23.45$ ),  $F(1, 118) = .846$ ,  $p = .360$ ,  $\eta^2 = .007$ . For positive emotions there was also no significant main effect between the reading ( $M = -16.81$ ,  $SD = 27.47$ ) and writing condition ( $M = -14.28$ ,  $SD = 28.48$ ) as well,  $F(1, 118) = .244$ ,  $p = .622$ ,  $\eta^2 = .002$ . This implies that also for the negative news message the change in negative and positive emotions did not differ between children who were instructed to read comments of other children and children who were instructed to write a comment.

### **Post-hoc analysis**

The absence of a difference between the active and passive coping strategy for both news messages raised the question what could explain this. A post-hoc analysis was carried out, because we were interested in whether the effects on positive and negative emotions

would be different for children who wrote a longer comment (similar to the average comment children in general write on the Jeugdjournaal app, as derived from Study 1) and children who wrote a short comment. To investigate this, we calculated length of each answer given in the writing condition and used a median split to create a new variable which divided the children of the writing condition in two groups: one that wrote a long comment (39 tokens or more) and one that wrote a short comment (less than 39 tokens). This new variable was used as a factor in an ANOVA to test if the change in emotions differed between the long comment and short comment group, which is an appropriate method (Iacobucci, Posavac, Kardes, Schneider, & Popovich, 2015).

For the positive news video the length of the comment had no effect on the change in positive emotions,  $F(1, 57) = 1.547, p = .219, \eta^2 = .026$ , and on the change in negative emotions,  $F(1, 57) = .351, p = .556, \eta^2 = .006$ . This implies that children in the short comment group and in the long comment group felt the same levels of positive and negative emotions after the positive news video and the writing task.

For the negative news video, the post-hoc analysis revealed a main effect of length on change in positive emotions,  $F(1, 61) = 5.346, p = .024, \eta^2 = .081$ . The positive emotions of the long comment group ( $M = -8.40, SD = 26.20$ ) did significantly decrease less than those of short comment group ( $M = -25.23, SD = 29.91$ ). This indicates that children who wrote a long comment felt higher levels of positive emotions after the negative news video combined with the writing task, and were therefore less affected by the negative news video than children who wrote a short comment. For negative emotions the effect was not significant,  $F(1, 61) = 2.272, p = .137, \eta^2 = .036$ . However, the descriptive results did reveal a similar pattern, with negative emotions increasing less for the long comment group ( $M = 12.20, SD = 23.45$ ) than for the short comment group ( $M = 21.45, SD = 23.63$ ). Thus, there are some indications that

writing a longer comment might have beneficial effects on regulating emotions after watching negative news.

## Discussion

The current research project investigated the uses and effects of online commenting on the NOS Jeugdjournaal app. In Study 1 we explored children's uses of the online comments function by focusing on how children comment on the NOS Jeugdjournaal app and whether they express emotions. We found an average of 707 comments per news message and an average length of 44 tokens. The topic *financial news* received most comments on average, followed by *culture, media and celebrities*, and *violence and crimes* (RQ1). The content of the comments was quite neutral, but children did express emotions in their online comments. In general, the emotional expressions in their comments were more positive than negative (RQ2). In addition, we found that some news characteristics predicted emotional expressions (RQ3). Characteristics that predicted most positive expressions were positive news, light news and the topic culture, media and celebrities. Negative expressions were particularly elicited by negative news, light news and the topic violence and crimes. Lastly, characteristics that predicted words that indicated how strong children felt the emotion were more likely to be used as a response to negative news, heavy news and the topic violence and crimes.

In line with earlier research among adults (e.g., Barnes, 2015), this study also found indications that a large majority of the (young) news audience reads comments, and only a small proportion of visitors writes a comment on the NOS Jeugdjournaal app. According to visitor numbers of the NOS Jeugdjournaal, the app has approximately 40,000 unique visitors a day, of which 10,000 visitors visit the question/statement children can react to (NOS, 2017). The finding that there are on average 707 comments per news message means that

approximately 7% of the unique visitors of the NOS Jeugdjournaal app who read the question, comment on news messages.

The finding that financial news received most comments on average is surprising, because earlier research indicates that children are less interested in political and financial news (Alon-Tirosh & Lemish, 2014). An explanation might be that the topic financial news was only six times present in our data set of 476 news messages, while for example violence and crimes was 30 times present, and culture, media and celebrities 174 times. Especially, two of the six news messages received a lot of comments. These news messages were about financial problems of a retailer (C&A) and about milk and butter becoming more expensive. It is unclear why those two news message received such an amount of comments, and this might be a coincidence.

The finding that light news items received more negative words than heavy news items seems also counterintuitive, because heavy news is known to evoke more negative emotions in children, while light news is expected to take the weight off heavy news messages (Walma van der Molen & de Vries, 2003). A possible explanation might be that among the light news messages there were more news messages that raised discussion. For example, light topics about celebrities can evoke a variety of positive and negative opinions, while a heavy topic such as a war mainly evokes opinions in the same direction (the general opinion is that a war is bad). News messages raising discussion might stimulate children to comment on such a news message, because we also found that light news topics received more comments in general than heavy news topics. Future research could perhaps investigate whether there are (light) news topics that raise discussions among children and if children also respond to each other in their comments.

Study 1 functioned as an exploratory step for Study 2. The finding that children express their emotions in online comments, provides additional support for the need to

investigate the effects of the passive and active coping strategies in Study 2. The passive coping strategy is built on the idea that children are relieved by seeing other children's emotional responses (Walma van der Molen & de Vries, 2003). The active coping strategy is built on the idea that writing a comment is a form of emotion regulation in which writing about (emotional) thoughts is beneficial for psychological health outcomes (Burton & King, 2008; Gross, 1998). For both strategies it is thus useful to know that children already express emotional feelings on the NOS Jeugdjournaal app, because this implies that the NOS Jeugdjournaal app is a potential tool for coping with news. Study 1 is the first study that provides those insights in children's online (emotional) comments to news.

Study 2 investigated the effects of online commenting on the NOS Jeugdjournaal app. The baseline study revealed that the negative news video reduced positive emotions and increased negative emotions. The positive news video did not change children's emotions before and after exposure. This might be due to the relatively high levels of positive emotions (82.67 on a scale ranging from 1-100) and low levels of negative emotions (4.94 on a scale ranging from 1-100) children already felt at the beginning of the study. These high levels of positive emotions may be, at least partly, due to the use of tablets in this study. Children were very excited about working on tablets, which might have increased their levels of positive emotions at the beginning of the experiment (pre-measure of emotions).

The main study did not yield a difference between the passive coping strategy and the active coping strategy after watching a positive or negative news message. However, the post-hoc analysis suggests that the length of the comment may play a role in the change in emotions after consuming a negative news message: positive emotions decreased less when a longer comment was written. This implies that writing a longer comment could have beneficial effects on regulating emotions after watching negative news. This deserves attention in future research. A suggestion would be to set up a study that measures the effects

of writing a long comment and compares this to the passive coping strategy and a control group. To stimulate children to write a longer comment, a simple tool from Study 2 could be used. In Study 2 the arrow to go to the next question after writing a comment was made available after one minute. Extending this time period of one minute might be a tool to stimulate writing a longer comment. Furthermore, asking the question in an open way could also elicit longer comments of children.

Comparing the results of Study 1 and 2 there is a remarkable finding regarding positive news. In Study 1 we found that more children comment positively (instead of negatively) and that positive news received more comments containing emotional expressions than negative news. In contrast, in Study 2 we found that the positive news video did not affect children's emotions. It is thus surprising that children do comment with more emotional expressions on positive news messages, even though their emotional state seems not affected by the positive news message. This provides an additional argument for why positive news deserves more attention in future research: based on these results questions remain regarding the effects of positive news on children and why it motivates them to write online comments to positive news messages.

The current research project has some limitations that need to be mentioned. First, in Study 1 the counting approach that we used was a basic technique to investigate emotional expressions. Because we only counted emotion words that were among the 50 most frequently used words, and only singular words, this might give a somewhat underestimation of children's emotional expressions. With the counting approach we were not able to look at specific phrases, for example the meaning of the word 'nice' can change completely when 'not' occurs before the word. However, the sentiment analysis, that provided a general overview of the positivity and negativity in all comments (taking into account phrases and sentences) supported the general findings of our counting approach. Nevertheless, for future

research it would be interesting to conduct a deeper analysis of children's emotional expressions in their comments. Including emoticons (smileys), and less frequently used words that also express emotions, could provide a more detailed overview of their emotional expressions in their online comments.

Second, in Study 2 we did not investigate whether the effects on emotions were different for children whose comments contained emotional expressions. The comments children wrote in Study 2 were similar in length and emotional content to the comments that were analyzed in Study 1. This replication increases the reliability of the results found in Study 2, because children showed more or less the same behavior as children did in real life. Similar to Study 1, in Study 2 also one in five comments contained emotional expressions. The consequence, however, is that the amount of children that expressed their emotions in their comments was too small to analyze post-hoc, and thus to compare to children who did not use emotional expressions in their comments. Future research could use more sophisticated methods to identify emotions and include a larger sample of children who write comments, to investigate possible differences in effects on emotion regulation.

A third limitation of this research project is that Study 2 did not include a control group. We decided to exclude a control condition, because it was not possible to find a suitable activity to perform for one minute that would not influence children's emotions. For example, it is likely that activities such as reading another news message, drawing or solving a little puzzle affect children's emotions. Instructing children to not do anything could also influence their emotions, for example because they might get bored, or have more time to think about the news message than children in the other conditions.

The baseline study thus functioned as an alternative to provide insights in the direct effects of the news videos on children's emotions. Nevertheless, it is not possible to directly compare the results of the baseline study with the results of the main study, because there was

a longer time frame between the last questionnaires of both studies. This time period could also affect their emotional state. It would then be unclear whether possible differences in effects on emotions were due to the coping strategies or to the passing of time.

Despite these limitations, this research project provided useful insights. Theoretical insights are provided by contributing to an overview of children's comments to online news messages, and by analyzing the effects of online commenting in the NOS Jeugdjournaal app on children's emotional feelings. There are preliminary indications that under some conditions writing might function as a coping strategy. However, future research should reveal whether the NOS Jeugdjournaal app is a suitable tool for children to cope with their emotions. In all, this research project is an important first step in investigating the NOS Jeugdjournaal app as a tool for coping with emotions elicited by positive and negative news, where future research can build on.

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## Appendix 1.

### Study 1: Descriptive statistics for topic

**Table 6.** Descriptive statistics of topic in comments data set

<b>Topic</b>	<b>Min</b>	<b>Max</b>	<b><i>M</i></b>	<b><i>SD</i></b>
Political news	265	721	414	143
Financial news	368	1475	844	450
World problems	309	571	405	116
Violence and crimes	185	4523	791	804
Disasters	160	949	459	362
Culture, media and celebrities	157	4116	831	621
Sports and leisure	78	2732	567	455
Animals	116	1646	744	450
Nature and environment	86	2652	678	620
Education	134	2061	622	404
Science and technology	272	996	609	340
Health	262	1391	664	396
Prosocial behavior	222	1312	577	314
Remaining positive/funny news	185	2373	683	486
Other topics	137	2609	715	640

## Appendix 2.

### Study 2: Selected comments for reading instruction



#### Reacties

Dagmar

Ja. Ik heb er gewoon een in mijn tuin. Maar ik ga ook soms naar een trampoline hal :)

bente en marit

Ja dat is leuk :)

Juultje

Ik ben er nog nooit geweest maar ik zou er een keer heel graag naar toe willen gaan!!!

ella

ja natuurlijk! supertof!

Naomi

Nee ik ga er niet vaak op maar ik heb er wel een en ik vind het heel leuk hoor

Eveline

Ik ga elke week trampolinespringen want ik zit op de sport.

sanne

Nee, niet echt meer maar vroeger deed ik het heel veel

Femke

Ja erg vaak want ik heb er een in mijn tuin. Dus ik ga vaak trampoline springen.

Mara

Ik heb zelf geen trampoline maar als ik bij iemand aan het spelen ben dan altijd.

Luuk

Ja want het is super leuk!!!!!!!!!!!!!!



NOS Jeugdjournaal

Maak jij je zorgen over de oorlog in Syrië?

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### Reacties

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Amélie en Alice

Ja, ik maak mij heel erg zorgen en ik wil graag dat de oorlog stopt, want anders durven die kinderen niet meer uit hun huis te gaan. Ik zou wel weten aan hun willen geven.

Anoniempje

Ja ik vind het echt zielig

Aniek

Ja, heel erg. Ik zou graag willen dat de oorlog op houd. En dat ze allemaal een veilig plekje hebben

Elise

ja heel erg

Evelien

Ja heel erg ze moeten stoppen

Julian

Ik maak me heel erg zorgen

Kayleigh

Nee ik maak me niet zo veel zorgen. Maar ik blijf het wel zielig vinden voor de mensen die er in moeten leven. Soms ben ik wel bang dat er ook in Nederland aanslagen komen.

Milan

ja heel erg want er zijn daar ook veel kinderen en die zien dat allemaal dat is erg

Sara

Ja daar maak ik me heel erg zorgen over.

Zoey

Ja arme kinderen