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Flaming on YouTube

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ABSTRACT

In this explorative study, flaming on YouTube was studied using surveys of YouTube users. Flaming is defined as displaying hostility by insulting, swearing or using otherwise offensive language. Three general conclusions were drawn. First, although many users said that they themselves do not flame, flaming appears to be very common on YouTube. Second, views on flaming varied but were more often negative than positive. Some people refrain from uploading videos as a result of flaming, but most users do not think of flaming as a problem for themselves. Third, several explanations of flaming were found to be plausible, among which were perceived flaming norms and the reduced awareness of other people's feelings. Although some YouTube users flame for entertainment, flaming is more often intended to express disagreement or as a response to a perceived offense by others.

1. Introduction

1.1. Presence of flaming behavior

The Internet makes various activities very easy, among which are finding all kinds of information and communicating with geographically distant people. However, just like earlier breakthroughs, such as the telephone and television, discussions about the Internet have focused on its negative aspects as well as its possibilities (Bargh & McKenna, 2004; McKenna & Bargh, 2000). Compared to face-to-face (FtF) communication, computer-mediated communication (CMC) seems to be more hostile and offensive. One example of this phenomenon is often called "flaming," although the term is controversial.

The term "flaming" originates from the early computing community, and The Hacker's Dictionary (Steele et al., 1983) defines it as speaking "rabidly or incessantly on an uninteresting topic or with a patently ridiculous attitude" (p. 158). Early research on CMC adopted the term and used it to indicate different kinds of what seemed to be uninhibited behavior, like "expressing oneself more strongly on the computer than one would in other communication settings" (Kiesler, Siegel, & McGuire, 1984, p. 1130) and "the expression of strong and inflammatory opinions" (Siegel, Dubrovsky, Kiesler, & McGuire, 1986, p. 161). Definitions and operationalizations of the term have since been inconsistent. Sometimes the term meant displaying offensive language such as swearing and insults; other times, it included all kinds of emotional expressions or even the use of superlatives (Lea, O'Shea, Fung, & Spears, 1992; Thompsen, 1996). While some scholars have acknowledged this problem and have tried to redefine "flaming" (O'Sullivan & Flanagin, 2003), others have argued that the term has been used so inconsistently that it has lost any theoretical value (Lange, 2006).

Although the term is controversial, flaming is a very real phenomenon. Several studies have shown that flaming is more apparent in CMC compared to FtF interaction (Kiesler, Zubrow, Moses, & Geller, 1985; Orenga, Zornoza, Prieto, & Peiró, 2000; Siegel et al., 1986; Sproull & Kiesler, 1986).

Flaming seems to be quite prevalent on YouTube, a very popular video-sharing website. Users can upload their own short videos and comment on those of others. In December 2008, 98.9 million visitors watched 5.9 billion videos (ComScore, 2009). Although the majority of the YouTube users seem to be passive, not uploading many videos and hardly ever using the various communication tools provided by the website, some active users post many videos and often comment on other videos (Cheng, Dale, & Liu, 2007; Halvey & Keane, 2007). One form of active YouTube participation is "video blogging," which is the video version of text-based weblogs. Sharing their experiences, ideas and feelings online allows people to get in contact with each other and as such to form an online community (Lange, 2007b, 2007c). Lange (2007a) interviews several YouTube users, mostly active ones. Most interviewees acknowledged "hating comments" to be common and saw them as distinct from constructive criticism. Whereas criticism is usually on-topic and can be used to exchange views, hating comments are generally unrelated to video content and express general hostility; an example of this is "This sucks. Go die."

Lange (2007a) offers a possible explanation of the widespread flaming on YouTube. She mentions that many people think of "haters" as users who do not post videos themselves. According to this

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view, there is a class of YouTube users who "post pointless comments that have nothing or little to do with the video while never having to risk receiving unpleasant criticism themselves" (p. 7). This view suggests that a part of the YouTube audience simply enjoys insulting others. YouTube seems to attract a young audience. In 2006, it was estimated that about half of YouTube users are under 20 years of age (Gomes, 2006) and that the mean age is around 25 (Halvey & Keane, 2007). These "haters" might therefore just be bored teenagers who like to take bullying outside the scope of their classroom.

The present study aims to examine and explain flaming on YouTube in greater detail. Flaming is defined as "displaying hostility by insulting, swearing or using otherwise offensive language" (Moor, 2007). This definition refers only to the behaviour without assuming anything about causes or contexts. While the term "flaming" is used to refer to the behaviour, the messages themselves are often referred to as "flames." The first purpose of this study is to gain more insight into the presence of flaming on YouTube and how this is perceived by YouTube users who post videos and those who comment on these videos. Although one can easily find many examples of flaming when reading comments on YouTube, a survey involving actual YouTube users provides evidence for whether flaming is perceived being common. Therefore, the following research question is formulated:

- RQ1: Is flaming common on YouTube?
  - RQ1a: Do YouTube users often perceive flaming?
  - RQ1b: Do many YouTube users flame?

The second question addresses the views that YouTube users have on flaming. In her interviews, Lange (2007a, 2007b) finds that users had very different views on flaming. While some said that flaming is really annoying or is even a reason to refrain from uploading personal videos, others argued that flaming is an honest way of having discussions not found in real life. For the present research, the popularity of these views on YouTube is studied. Also, the extent to which flaming is perceived as a problem is studied.

- RQ2: What do YouTube users think of flaming?
  - RQ2a: Do YouTube users think of flaming as something positive or negative?
  - RQ2b: Do YouTube users think of flaming as a problem?
  - RQ2c: Does flaming keep people from posting personal videos?

1.2. Explanations of flaming

Besides exploring the presence of flaming on YouTube and how this is perceived by actual YouTube users, as presented in RQ1 and RQ2, the second purpose of the study is more theoretical. If flaming is indeed common on YouTube as well as in other CMC environments, how can this flaming behaviour be explained? This question is addressed in RQ3:

- RQ3: Why do people flame on YouTube?

This research question will be further developed in subsequent subsections in which several explanations and existing research on flaming in different contexts will be discussed. Most of these explanations explain why flaming is more common during CMC compared to FtF communication. An underlying assumption that is fundamental to most of these explanations is that CMC lacks many social context cues that are used in FtF communication. This fundamental distinction between communication channels has already been made explicit by early CMC researchers (Kiesler & Sproull, 1992; Sproull & Kiesler, 1986). According to this approach, sometimes called "cues filtered out" (Culnan & Markus, 1987), the lack of social cues makes CMC difficult and causes people to display several kinds of seemingly uninhibited behaviour online (Collins, 1992). Although many researchers have criticized the technological determinism assumed by early theories (e.g., Culnan & Markus, 1987; O'Sullivan & Flanagin, 2003; Spears, Postmes, Lea, & Wolbert, 2002; Walther, 1994), most theories about flaming use this lack of social context cues in one way or another to explain why flaming is more prevalent online than FtF. Explanations of flaming are presented in three categories, namely a changed awareness of self and others, miscommunication and intentional behaviour.

1.2.1. Changed awareness of self and others

One of the earliest explanations of flaming is that it is caused by deindividuation. Deindividuation is the term originally used to describe the phenomenon that people behave differently in groups. When individuals are together in groups, they are less inhibited and more prone to indulge in unrestrained behavior that they would not indulge in on their own (Festinger, Pepitone, & Newcomb, 1952). Deindividuation, or submergence in a group, occurs when awareness is drawn away from the self by situational characteristics such as anonymity, altered responsibility and sensory input overload (Diener, 1977). The resulting behavior is believed to be impulsive and hyper-responsive to the behavior of others nearby, which may be anti-normative and aggressive. According to Kiesler et al. (1984), typical CMC situations might be similar to deindividuation in a group. When people are online, they are usually anonymous. The lack of personal cues may draw attention away from the self and others. A central concept to deindividuation theory is reduced self-awareness. However, early CMC researchers have theorized that the awareness of other people might also be reduced (Kiesler & Sproull, 1992; Kiesler et al., 1984). Apart from deindividuation, the reduced awareness of others might be an effect on its own.

Although the deindividuating conditions of CMC were originally believed to automatically lead to anti-normative behaviour (Kiesler et al., 1984), Lea and Spears (1991) have conducted an experiment on polarization towards group norms in a CMC discussion to show that online behaviour can in fact be highly susceptible to perceived norms. When participants were addressed as group members, they showed high conformation. If they were addressed as individuals and thought that the experiment was aimed at finding differences in personal communication styles, their opinions diverged. This effect was reduced and even reversed when participants could see each other during the discussion. Lea and Spears argued that anonymity in CMC does not lead to more anti-normative behaviour but rather that it makes people more prone to conform to salient group norms. In a review of the literature on flaming, Lea, O'Shea, Fung, and Spears (1992) argue that flaming might also be normative behaviour when appreciated in the specific contexts in which it happens, instead of being anti-normative as deindividuation theorists have suggested.

Reicher, Spears, and Postmes (1995) present an alternative theory of deindividuation effects based on Social Identity Theory (Tajfel & Turner, 1986) and Self-Categorization Theory (Turner, 1987). According to this Social Identity model of Deindividuation Effects (SIDE), deindividuating circumstances do not reduce self-awareness in an individual. Rather, the personal identity makes room for a social identity. This identity switch, called depersonalization (Turner, 1987, p. 50), happens when a group is more salient than the individuality of its members. This is the case in anonymous situations traditionally associated with deindividuation. Two consequences of depersonalization are conformation to perceived group norms and the higher attraction of fellow group members. Convincingly, a meta-analysis has shown that the results of 60 deindividuation studies could be explained better by the SIDE model than by deindividuation theory itself (Postmes & Spears, 1998).

Some CMC research has focused on the effects of group self-categorization, which is identifying oneself as a group member. Visual anonymity has been shown to increase self-categorization, which in turn increases group attraction and other-stereotyping in terms of the group (Lea, Spears, & De Groot, 2001). In another experiment, conformation to primed norms was higher in anonymous groups than in identifiable groups (Postmes, Spears, Sakhel, & De Groot, 2001).

In an analysis of online communication between students, Postmes, Spears, and Lea (2000) find that different groups developed different communication norms over time. These norms were only applied to communication inside the group. Interesting for the present discussion is that some groups developed communication styles in which flaming was quite common. Although outsiders might think that group members were being offensive to each other, a closer view showed that flames were in fact meant to be funny. Whereas students in one group seemed to enjoy insulting one another, other groups only rarely flamed, indicating that flaming can indeed be normative behaviour within a group. Kayany (1998) also found group differences in flaming when analyzing different newsgroups. It seems that flaming can be normative rather than anti-normative within online communication groups. According to Spears et al. (2002), CMC in some ways is actually more social than FtF communication.

Moor (2007) finds that people conformed to a perceived flaming norm when giving feedback on an online text with which they disagreed. People flamed more often when comments contained flames. People who had flamed, however, liked a fellow commenter less than people who had not, while the opposite effect would fit better with the SIDE model.

The present research addresses whether a changed perception of self and others might explain flaming behaviour on YouTube, or, more specifically, whether the perception of a flaming norm or whether reduced awareness of others are possible causes of flaming on YouTube:

- RQ3a: Is flaming on YouTube caused by the perception of a flaming norm?
- RQ3b: Is flaming on YouTube caused by reduced awareness of other people's feelings?

1.2.2. Miscommunication

In research, messages have often been coded as flames by third party observers, i.e., individuals who themselves are not involved in the communication process (e.g., Aiken & Waller, 2000; Kiesler et al., 1985; Moor, 2007; Postmes et al., 2000). Critics, emphasizing the importance of context, have argued that it is the perception of the interactants that counts (Lange, 2005; O'Sullivan & Flanagin, 2003; Thompsen, 1996). The earlier-discussed analysis by Postmes et al. (2000) shows that messages can look very offensive to outsiders while in fact being funny from both the sender's and the receiver's point of view.

The sender and receiver, however, may also perceive messages differently. During FtF communication, non-verbal cues are very important for informing the receiver about the sender's emotional state and the meaning of verbal messages (Carter, 2003; Kock, 2005). For example, simple words like "okay" can be spoken in different tones, making its meaning shift from true agreement to mere compliance, surprise or even annoyance. Body language can subtly let a speaker know that the listener has lost interest in the conversation. Another example is sarcasm. Intonation and facial expression are very important to let the receiver of a message know not to take it seriously. Kruger, Parker, Ng, and Epley (2005) say that "non-verbal information is an important clue to the speaker's meaning, particularly when the literal content of the message is ambiguous" (p. 926). CMC environments, lacking many non-verbal cues, may therefore increase communication ambiguity or misinterpretation of messages (Derks, Fischer, & Bos, 2008; Kock, 2005).

The importance of non-verbal cues is emphasized by the existence of emoticons, which are verbal substitutes for cues like facial expressions (Derks et al., 2008). Emoticons have become so widespread that many popular CMC systems now offer the ability to add pictorial emoticons to messages (Riva, 2001). With regard to flaming, emoticons have been found to influence the interpretation of verbally offensive messages (Thompsen & Foulger, 1996).

Kato and Akahori (2004) show that interpreting the emotional state of a communication partner indeed seems to be harder during CMC compared to FtF communication. In another study, a more negative interpretation of another's emotional state was related to more negative emotions (Kato, Kato, & Akahori, 2007). Although Kato and his associates conclude that miscommunication causes negative feelings, their method does not seem to address the direction of the found correlation. Therefore, another interpretation of their results might be that negative emotions are more prone to be misinterpreted. Sarcasm has also been found to be misinterpreted more often during CMC than during FtF communication (Kruger et al., 2005). Both senders and receivers seemed to be unaware of this effect, overestimating the effectiveness of the communication.

If miscommunication occurs so easily during CMC, it might also be involved in flaming. It might be that the ambiguity of messages is frustrating and invites people to express themselves more explicitly. More explicit messages from frustrated communication partners may become hostile and aggressive.

Instead of being a consequence of miscommunication, flaming might also itself be a form of miscommunication. Perhaps flames are only perceived as offensive by the receiver of a message, while the sender has no such intention (Thompsen, 1994).

More evidence for the ambiguous nature of CMC messages, such as flames, comes from McKee (2002). Analyzing discussions about racial issues on an asynchronous forum for students, she finds a large amount of hostility, which she at first interprets as flaming. When she interviews some active discussion participants afterwards, she finds that messages were often interpreted more offensive than they had been intended to be. Messages that looked like flames were actually not intended to be insulting. Participants reported that they felt angry when they interpreted a message as offensive that and they felt the need to respond right away, resulting in messages displaying their anger. Miscommunication can easily occur in CMC and lead to what looks like flaming, with several participants feeling insulted without any initial offensive intent from anyone. In an FtF discussion, the actual meaning of a message can immediately be explained more thoroughly when it is interpreted incorrectly, but this quick feedback is absent in (asynchronous) CMC.

For the present research, the question of whether miscommunication plays a role in flaming on YouTube is studied:

- RQ3c: Is flaming on YouTube in fact miscommunication?

1.2.3. Intentional behavior

All explanations that have been discussed in the previous subsections assume that people normally are very friendly in communication and thus that there must be an external cause of a negative phenomenon like flaming. Perhaps this underlying assumption about people's good intentions is wrong, and people actually intend to offend others. Contrary to many other situations, the Internet is a safe place to hurt other people's feelings because it is often anonymous and lacks immediate repercussions normally related to aggressive behaviour. Indeed, teenagers have found the Internet as a relatively safe bullying place (Van Den Akker, 2005; Willard, 2004). Levander (1994) even reports on people grouping together to start flame wars in innocent people's discussion groups,

for example, by sending graphic messages about cat killing to cat-lovers. Their intention is to provoke aggressive responses in other people, which they find entertaining. Unfortunately, it is not clear to what extent this deliberate flaming happens on the Internet. Alonzo and Aiken (2004) ask students for what reasons (e.g., entertainment or relaxation) they would flame. However, they consider only the experimental situation and do not relate these reasons for deliberate flaming to real-life behaviour. As discussed earlier, Lange (2007a) also suggests that flaming might be intentional behaviour; a part of the YouTube audience simply enjoys insulting others.

If flaming is not specifically meant to hurt others, it may also be used to achieve or maintain one's status within an online community. People intentionally try to provoke other people to flame, in which case they themselves make a better or more professional impression than the defensive individual (Lee, Wagner, Cheung, & Ip, 2002). Lange (2005) provides two examples of this process and argues that both displaying hostility and accusing another person of it serve social purposes in a community.

Acknowledging that it might be intentional behaviour, the present research addresses reasons that people have for flaming.

- RQ3d: What reasons for flaming do YouTube users give?

2. Methods

2.1. Overview

A survey was conducted among YouTube users. Posters of videos on which flames were given, referred to as 'receivers,' and senders of flames were invited to participate in the study. Details on the selection process are provided in the next section. The survey was conducted by means of three questionnaires. One questionnaire was for senders of flames, and one was for receivers. The third questionnaire was a general questionnaire aimed at a representative group of YouTube users. Dependent measures were the perception of flaming on YouTube and possible explanations for flaming. A comparison of the intended and interpreted meanings of flames made it possible to investigate whether miscommunication had occurred.

2.2. Selection of videos, flames and participants

To invite receivers and senders of flames on YouTube to participate in this study, a list was needed of posted videos and (recent) comments from which a random sample could be drawn.

To invite YouTube users to fill out one of the questionnaires, two other lists were needed. First, to invite senders and receivers of specific flames, a list of comments on videos was needed. Second, for the general questionnaire, a list of random YouTube users was needed. Ideally, both lists would contain samples completely randomly drawn from all existing YouTube users and (recent) comments. In an attempt to approach this ideal situation, a list of videos (i.e., unique video IDs) provided by Xu Cheng was used. This list was generated using the YouTube Crawler (Cheng et al., 2007, pp. 2–3). It was acquired between February 15 and April 8, 2008, and it contained exactly 161,085 videos.

To select flames, an initial list of 750 videos was created. These videos were picked randomly from the original list, and they were only added to the new list if they were still available (i.e., they had not been deleted by the video poster), if there were at least five comments on their video (excluding replies from the video poster himself), and if these comments were (mostly) in English. Twelve of the 750 chosen videos were removed from the list afterwards because they had been removed in the meantime or because they did not meet the criteria on a second view. For the 738 remaining videos, the five comments leading the comment list (usually the most recent comments, although occasionally sorted otherwise caused by replies to comments) were rated to be either flames or not using the definition given above. The first five comments on 235 of the 738 videos were found to contain one or more flames. Selected flames were inserted into the questionnaire system such that all senders and receivers could be invited to a unique questionnaire. Each sender was asked about his/her comment. If more than one comment of the same user had been selected, only the oldest one was addressed. Receivers were asked about one or more comments that they had received.

Invitations were sent using YouTube's messaging system. In total, 225 receivers and 353 senders were sent invitations to questionnaires, and there were about 368 selected comments.

For the general questionnaire, the process of selecting YouTube users was easier. Random videos were chosen from the original list, excluding videos that had already been used for the selection of flames. For each selected video, the video poster and the sender of the first comment (i.e., the most recent comment, if one or more comments had been given) were selected. If they had not already been invited to one of the questionnaires, they were sent an invitation to the general questionnaire. Again, users were not contacted if their accounts had in the meantime been closed or if they could only receive messages from friends. In total, 697 YouTube users were invited to fill out the general questionnaire.

2.3. Invitations to the questionnaires

All selected YouTube users were sent invitations on their YouTube accounts. In these invitations, the general research focus of "communication on YouTube" was given instead of the more specific concept of flaming.

Each message contained the URL (web address) of the questionnaire. For the general questionnaire, all participants were given the same URL. Senders and receivers of selected comments were given a different URL, which contained a unique ID to identify the YouTube user within the questionnaire system.

2.4. Instruments

The questionnaires for senders and receivers and the general questionnaire were similar to some extent. They all consisted of items measuring general background variables, including demographics (gender, age and country) and YouTube usage. The last page of each questionnaire provided room for participants to give any additional comments and to leave their e-mail addresses.

2.4.1. Specific questionnaires

The main purpose of the specific questionnaires was to make a comparison possible between perceptions of flaming by senders and receivers.

The questionnaire for senders consisted of items about the specific comment that was selected (see Table 1). The comment was given along with the title of the video that had been commented on. Also, a link to the YouTube page with the video was provided such that a sender could refresh his/her memory by having a look at the video that was commented on. Some questionnaire items about the selected comment measured specific background variables (i.e., the intended recipient of the comment and the familiarity of the sender with the video poster). Other items measured the purpose of the comment and the assumed interpretation of the comment by the receiver. Also, the definition of flaming was given, and the sender was asked whether he/she would call the comment flaming. The main goal of these items was comparison between senders and receivers to find out whether miscommunication had occurred (RQ3c). Since validated questionnaires about flaming as miscommunication were unknown to us, the questionnaire was

Table 1
Answer category popularity with senders and receivers on the specific questionnaires.

Question	Answer category	Senders (%)	Receivers (%)
Person at whom the comment was primarily aimed	Video poster	26.3	44.4
	Other person in the video	25.3	9.5
	Other commenter	28.4	28.6
	Nobody in particular	15.8	11.1
	Other	4.2	6.3
Familiarity of sender/receiver	Not familiar	85.3	90.5
	Familiar, no regular contact	7.4	7.9
	Regular contact on YouTube	4.2	1.6
	Familiar even outside YouTube	3.2	0
Purpose of the comment	Giving an opinion	64.2	44.4
	Providing information	22.1	12.7
	Being funny or amusing	18.9	12.7
	Offending someone	24.2	49.2
	Provoking reactions	15.8	42.9
Interpretation of the comment	Appreciated given opinion	21.1	31.7
	Appreciated provided information	6.3	7.9
	Found funny or amusing	24.2	27.0
	Was offended	31.6	27.0
Was the comment flaming?	Yes	44.2	60.3
	No	55.8	39.7

a first attempt to measure miscommunication in a quantitative way, using results of earlier more qualitative and analytic studies on the purposes and the interpretations of comments by Thompsen (1994) and McKee (2002). Because the purposes and interpretations of comments were measured, however, results were also informative regarding the reasons for flaming (RQ3d) and the interpretations of flaming (RQ2a). Most items on the comment were given in a multiple-choice format, although with some items, room was supplied for submitting any information not covered by the pre-defined answers.

Only if senders had chosen "offending someone" as the purpose (or one of several purposes) of their comment were they given a second questionnaire page. This page contained only one open question, which asked them why they would like to be offensive (RQ3d).

The questionnaire for receivers was very similar to the questionnaire for senders. Items on a specific comment were formulated slightly differently to be appropriate for the perspective of the receiver. For example, the assumed purpose of a comment was asked instead of the actual purpose. The questionnaire for receivers could contain multiple comments that they had received, in which case all specific items were repeated for each individual comment in turn. For practical reasons, senders could only be questioned about comments to one video. The questionnaire for receivers did not contain any optional pages.

2.4.2. General questionnaire

On the general questionnaire, 16 items addressing general experience with YouTube and flaming were given. These items contained statements, to which agreement could be specified on a five-point Likert scale. Of these items, three were irrelevant for the present study and hence are not discussed. The other 13 items are listed in Table 2. The general questionnaire was especially constructed for the purposes of this study. It contained items concerning the interpretations and consequences of flaming as discussed in the paragraphs about the explanations of flaming.

If participants agreed to the statement that they flame regularly in comments on videos (i.e., S13 in Table 2), they were given a second questionnaire page with some statements regarding the reasons for flaming. Because this was only a very small number of participants, the results of these items are not analyzed or discussed further.

3. Results

Information about the number of participants and their characteristics is presented in Section 3.1. Section 3.2 will present an overview of the questionnaire results. In the remainder of this section, the results will be discussed for each research question in turn. All significance tests mentioned in this section were two-sided.

3.1. Participants

The questionnaire for senders was filled out by 95 participants (26.9%) and the questionnaire for receivers by 41 participants (18.2%). Only for 14 of the selected comments (3.8%) did both the sender and receiver fill out the questionnaire. The general questionnaire was filled out by 157 participants, but eight of them seemed to have submitted invalid answers to the questions (e.g., the same agreement to all Likert items). Of the 149 serious participants (21.4%), seven had used the open question at the end to make clear that they did not fully understand the concept of flaming. The results of these participants on items about flaming were omitted, while results on all other items were kept. Also, some participants who had been invited to one of the questionnaires did not fill these out but instead replied using the YouTube messaging system. These replies have not been used for any statistical analyses, but some of them are cited when appropriate.

The majority of all participants were male (75.1%). The average age was 21.77 years ($SD = 8.77$). The age distribution was heavily

Table 2
Means and standard deviations of agreement to the general questionnaire statements.

Item	Statement	Mean*	Standard deviation
S01	When I post a comment on a video, I sometimes feel like I forget about people's feelings	2.03	1.27
S02	I often see flaming when I read comments on videos	3.75	1.30
S03	I think flaming is a norm for commenting on YouTube	2.89	1.34
S04	I think flaming is a norm for commenting on specific YouTube videos	3.13	1.35
S05	When I see flaming in comments, I find it annoying	3.70	1.43
S06	When I see flaming in comments, I find it amusing	2.31	1.32
S07	I think flaming is usually meant to be funny	2.18	1.17
S08	I think flaming is just an honest way of expressing disagreement	2.51	1.41
S09	Flaming is a reason for me not to upload personal videos	2.32	1.39
S10	I think that flaming on YouTube is a problem for some YouTube users	3.93	1.22
S11	Flaming is a problem for me	2.38	1.44
S12	I have flamed one or more times in comments on videos	2.14	1.46
S13	I flame regularly in comments on videos	1.45	0.91

* Likert scales: 1, disagree; 5, agree.

skewed, with 50.7% of the participants aged under 20 and 69.6% aged under 25. A significant gender difference was found ($t(145) = 3.09$, $p = .002$), with men being more than 5 years older ($M = 24.10$, $SD = 9.87$) than women ($M = 18.62$, $SD = 7.49$). Age and gender distributions were similar for the different questionnaires.

For all three questionnaires, most participants were from the USA (41.1% of the senders, 56.1% of the receivers and 39.6% of the general questionnaire participants). Other participants were from all over the world, though most were from Europe and Canada.

Because gender, age and several measures of YouTube usage were strongly intercorrelated and some YouTube usage measures showed ceiling effects, background variables were not used in the analyses.

3.2. Overview of results for the questionnaires

Table 1 provides an overview of the items of the specific questionnaires as well as the popularity of the answer categories with both the senders and receivers.

Table 2 provides an overview of the statements used in the general questionnaire as well as the mean agreement specified by participants. Statements are numbered, as they will be referred to in the following subsections.

3.3. Discussion of results per research question

3.3.1. Is flaming common on YouTube?

RQ1a addressed how often YouTube users perceive flaming, and RQ1b addressed whether many YouTube users flame. To answer these questions, data were gathered using statements S02, S12 and S13 of the general questionnaire (see Table 2).

Participants in the general questionnaire showed agreement with statement S02 about often seeing flaming when reading comments on videos ($M = 3.75$, $SD = 1.30$). Most participants (64.8%) showed agreement, 38.0% completely (i.e., 5) and 26.8% slightly (i.e., 4). In contrast, only 19.1% showed disagreement (i.e., 1 or 2).

Several participants mentioned the regular occurrence of flaming on YouTube in their answers to the open question. For example, a 19-year-old woman from the USA noted: "I see a lot of flaming these days and it seems to be on almost every video." A 28-year-old man from Peru mentioned having over 700 videos himself and typed that "[no] video is exempt of being flamed."

Self-reported flaming behaviour was low. On the general questionnaire, 66.0% disagreed with statement S12 about having flamed one or more times, 12.1% disagreeing slightly (i.e., 2) and 53.9% disagreeing completely (i.e., 1). Average agreement with the statement was low ($M = 2.14$, $SD = 1.46$).

Regular flaming was reported even less often. On the general questionnaire, 84.4% disagreed with statement S13 about flaming regularly, 8.5% slightly (i.e., 2) and 75.9% completely (i.e., 1). Only 4.2% showed agreement, either slightly (i.e., 4) or strongly (i.e., 5). Average agreement was very low ($M = 1.45$, $SD = 0.91$).

Flaming regularly was significantly correlated with having flamed at least once ($r(139) = .60$, $p < .001$). Additionally, a significant correlation was found between having flamed at least once and often seeing flaming when reading comments ($r(139) = .25$, $p = .002$). No significant correlation was found between flaming regularly and often seeing flaming.

RQ1a, which concerns the frequent perception of flaming on YouTube, can be answered positively. Participants indeed indicated often perceiving flaming. The answer to RQ1b, about many YouTube users exhibiting flaming behaviour, is negative. Most participants denied having flamed even once, and only a small minority admitted flaming regularly. These results may indicate that a minority of YouTube users are responsible for the flaming that the majority frequently perceives. Another plausible interpretation is that many YouTube users submit comments perceived as flames from time to time but that they do not call their own behaviour flaming because they understand the good intentions of their own comments.

3.3.2. What do YouTube users think of flaming?

RQ2 addressed the views on flaming that YouTube users have and whether they think of it as a problem. To answer this question, data were gathered using statements S05–S11 of the general questionnaire (see Table 2).

The general questionnaire items concerning the interpretations and consequences of flaming were interrelated in many ways. All significant correlations ($\alpha = .01$) are displayed in Fig. 1. The three items representing non-negative interpretations (S06, S07 and S08) were all correlated to one another ($r \geqslant .30$), and they were all correlated negatively with the negative interpretation that flaming is annoying (S05, $r \leqslant -.27$). Most people disagreed with the non-negative interpretations S06 ($M = 2.31$, $SD = 1.32$), S07 ($M = 2.18$, $SD = 1.17$) and S08 ($M = 2.51$, $SD = 1.41$). Although agreement varied considerably, complete disagreement (i.e., 1) was the most popular answer category for all three statements (41.8%, 39.7% and 34.8%, respectively). Different results were found for statement S05, which calls flaming annoying ($M = 3.70$, $SD = 1.43$), where complete agreement (i.e., 5) was the most popular answer category (44.4%).

Thinking that flaming is a problem for other YouTube users (S10) was significantly correlated with thinking of flaming as a problem for oneself (S11, $r = .28$), with finding flaming annoying (S05, $r = .23$) and with considering flaming a reason not to upload videos (S09, $r = .24$). The latter three (S05, S09 and S11) were also correlated to one another, but this relationship was less significant ($.01 < p < .05$). Although the general view was that flaming is a problem for "some YouTube users" (S10, $M = 3.93$, $SD = 1.22$), most participants disagreed with the statement that flaming was a problem for themselves (S11, $M = 2.38$, $SD = 1.44$). Only 22.0% agreed to some extent (i.e., 4 or 5) with this statement, whereas 43.4% strongly disagreed (i.e., 1). Flaming was considered a reason not to upload videos to some extent (i.e., 4 or 5) by 22.7%, while 42.6% strongly disagreed (i.e., 1). Average agreement with S09 was low ($M = 2.32$, $SD = 1.39$). Unexpectedly, significant positive correlations were found between finding flaming a reason not to upload videos (S09) and two of the three non-negative interpretations of flaming (S07, $r = .30$; S08, $r = .27$).

On the specific questionnaires, senders and receivers were asked about the (assumed) interpretation of the selected comments. Receivers felt offended by 27.0% of the comments, while they found 27.0% to be funny and appreciated the sender's opinion in 31.7% of the cases. Senders seemed to assume slightly more negative interpretations of their own comments. When they were asked how they thought their comments had been interpreted by the video posters, they selected feeling offended more often (31.6%), appreciating the given opinion less often (21.1%) and finding a comment funny less often (24.2%). The fourth answer category, appreciating provided information, was the least popular for both receivers (7.9%) and senders (6.3%). Interestingly, another interpretation was found several times in the answers to the open question. 6.3% of the receivers gave an answer like "I didn't care," while 7.4% of the senders gave such answers (e.g., "he did not care i wouldent").

Comments were judged to be flaming more often by senders who believed that the receivers had interpreted them as offensive, but this association was not significant (Fisher's exact test, $p = .12$). For receivers, the relation between feeling offended and judging a comment as flaming was not significant either ($p = .15$). Their judg-

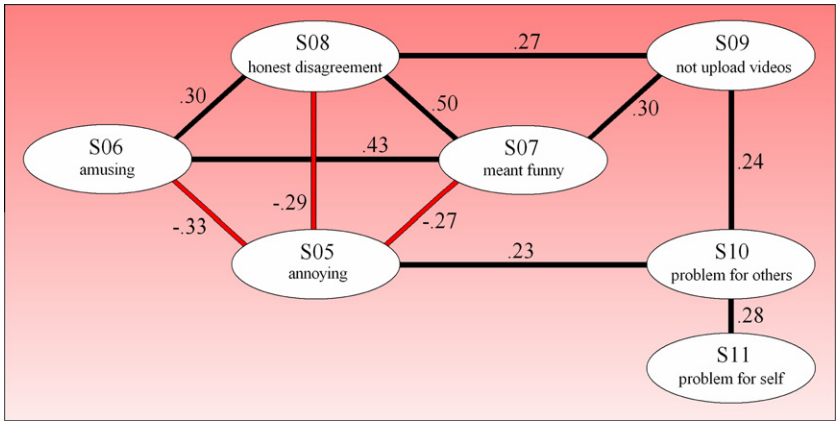

Fig. 1. Significant correlations ($\alpha = .01$) between general questionnaire items concerning attitudes on flaming.

ments of flaming were more strongly negatively associated with appreciating the information in a comment ($p = .01$) and finding a comment funny ($p = .08$).

Participants expressed very different views on flaming in their answers to open questions. While some participants argued that it is a negative phenomenon, others explained that it is a funny way of interacting that is not to be taken too seriously or that it is a necessary side effect of vivid debate and freedom of speech. Others showed more neutral views, arguing that flaming could best be ignored. A quick-and-dirty categorization of all relevant answers to the open question on the general questionnaire showed that about half of the comments were negative about the flaming, with the other half being either neutral or positive.

Altogether, the answer to RQ2a is that YouTube users think of flaming both in positive and negative ways. While some participants expressed their distaste of flaming, others argued that people should be able to express their opinions. Many participants gave opinions somewhere in between, calling flaming a negative side effect of the otherwise valuable freedom of speech. Although various opinions about flaming were given, most participants found flaming annoying, not amusing and not "just an honest way of expressing disagreement." Although flaming is not perceived as purely evil by everyone, most YouTube users seem to dislike it and to think of it as something negative.

Most participants indicated not finding flaming a real problem for themselves and not refraining from uploading videos, although most participants thought that flaming is a problem for other YouTube users. Several participants, though a minority, indeed noted refraining from uploading personal videos because of flaming. Also, several participants mentioned that they knew other people who have done so. Hence, the answers to RQ2b and RQ2c are similar. Flaming is indeed perceived as a problem and is indeed a reason for people not to upload personal videos, but this is only the case for a minority of YouTube users. To most YouTube users, flaming is not a problem.

3.3.3. Is flaming caused by the perception of a flaming norm?

RQ3a addresses whether a perceived flaming norm is a possible cause of flaming on YouTube. To answer this question, data were gathered using statements S02, S03, S04, S12 and S13 of the general questionnaire (see Table 2).

Agreement to the statements about believed flaming norms, as presented in the general questionnaire, was varied. The statement about flaming being a norm on YouTube (S03) was met with similar levels of agreement (34.5%), disagreement (37.3%) and neutrality (28.2%), yielding a neutral average ($M = 2.89$, $SD = 1.34$). The statement about flaming being a norm for commenting on specific videos (S04) was met with a little more agreement (38.0%) than disagreement (31.0%), yielding a slightly higher but still neutral average ($M = 3.13$, $SD = 1.35$). Agreement to both statements was significantly correlated ($r(140) = .66$, $p < .001$).

As can be shown in Table 3, believing in either kind of flaming norm was significantly correlated with a plausible cause, perceiving flaming regularly (S02). Also, believing in a flaming norm was significantly correlated with having flamed at least once (S12) and flaming regularly (S13). These results are compatible with the SIDE model, which predicts that people conform to perceived norms in (more or less) anonymous CMC contexts. YouTube users may indeed, after seeing a large amount of flaming, think that flaming is normative behaviour and conform to this norm.

However, the data from the general questionnaire provide no information regarding the directions of the relations shown in Table 3. Hence, alternative interpretations are possible. For example, participants may have indicated believing in a flaming norm to justify their own flaming behaviour. Furthermore, even if the causal direction is from believing in a flaming norm to flaming behaviour, no measures of depersonalization were taken in the present research.

The answer to RQ3a is that flaming on YouTube might indeed be caused by the perception of a flaming norm, although results of the present research are inconclusive.

3.3.4. Is flaming caused by a reduced awareness of other people's feelings?

RQ3b addressed the reduced awareness of other people's feelings as a possible cause of flaming. To answer this question, data were gathered using statements S01, S12 and S13 of the general questionnaire (see Table 2).

On average, participants did not agree with statement S01 about occasionally experiencing the reduced awareness of other people's feelings during commenting ($M = 2.03$, $SD = 1.27$). Almost half of the participants (49.7%) disagreed strongly (i.e., 1), and most

Table 3
Correlations between general questionnaire items concerning the normative nature of flaming.

Statement	S02	S03	S04	S12	S13
S02 (see flaming)	–	.46*	.43*	.25*	.09
S03 (norm YouTube)		–	.66*	.27*	.28*
S04 (norm specific videos)			–	.33*	.27*
S12 (flamed once)				–	.60*
S13 (flame regularly)					–

* Correlation is significant ($\alpha = .01$).

others disagreed slightly (20.1%) or were neutral (15.4%). Only 14.8% agreed either slightly or strongly to the statement.

The reduced awareness of other people' feelings during commenting was related to flaming. Significant correlations were found between the reduced awareness of others and having flamed at least once (S12, $r(139) = .33$, $p < .001$) as well as flaming regularly (S13, $r(139) = .32$, $p < .001$). Indeed, a 16-year-old male receiver typed: "These people don't understand that the people they flame are real people with real emotions." Interestingly, an 18-year-old man from Australia who had sent someone quite an offensive comment argued that he had been in a bad mood and that no harm was intended: "I myself have seen the mistake I have made and am now going to apologise."

The reduced awareness of other people's feelings indeed seems to be related to flaming and may possibly be a cause, as RQ3b suggests. However, an alternative interpretation of the results might be that flamers try to justify their behaviour by blaming the reduced awareness of others. If they would flame on purpose, however, one might wonder why they would admit their behaviour on an anonymous questionnaire but still try to seek excuses for it. Hence, the answer to RQ3b is positive; the reduced awareness of other people's feelings is indeed a plausible cause of flaming on YouTube.

3.3.5. Is flaming caused by miscommunication?

RQ3c addressed the notion that flaming might in fact be miscommunication. To answer this question, data were gathered using the specific questionnaires filled in by senders and receivers (see Table 1).

To study miscommunication, information from senders and receivers of selected comments must be compared. However only for 14 comments did both the sender and receiver fill out their questionnaires. Because of the low sample size, comparisons within these couples were omitted. Instead, the data from all participating senders and receivers were compared. Because these were mostly non-coupled data sets that may have faced self-selection biases, this comparison yields serious validity problems. Hence, the findings should not be interpreted as being conclusive.

Differences were found with regard to the targets of comments. Receivers thought most often that comments were primarily aimed at themselves (44.4%), while senders indicated that comments were actually aimed at receivers in only 26.3% of the cases. Comments were more often aimed at other commenters (28.4%) and almost as often at other persons in the video (25.3%).

Also, differences were found in the (assumed) purpose. While receivers often thought that comments were meant to be offensive (49.2%) or provoking (42.9%), senders indicated these purposes less often (24.2% and 15.8%, respectively). When asked about the (assumed) interpretation of comments, differences for "offensive" were much smaller (senders: 31.6%; receivers: 27.0%).

These results suggest that miscommunication might indeed be involved with flaming on YouTube. Video posters may think too often that comments are primarily aimed at them, and they may think that comments are intended to be offensive or provoking when they are not. However, these are only implications based on doubtful comparisons. Although some interesting implications have been given, RQ3c cannot be answered.

3.3.6. Is flaming intentional behaviour?

Acknowledging that flaming might be intentional behaviour, RQ3d addressed the reasons that YouTube users might have for flaming. To answer this question, data were gathered using the specific questionnaires filled in by senders and receivers. Answers to open questions were categorized based on their content.

On the specific questionnaires, the most popular purpose of comments among senders was to give an opinion (selected by 61 senders, or 64.2%). Only few comments were meant to be provoking (15.8%). Other reasons were not very popular, either (offending someone: 24.2%; providing information: 22.1%; being funny or amusing: 18.9%). Receivers assumed different purposes. Although giving an opinion was often believed to be one of a comment's purposes (44.4%), this was also true for being offensive (49.2%) and provoking (42.9%). Providing information and being funny were selected far less (both 12.7%). One should keep in mind that senders and receivers did not fill out questionnaires about exactly the same comments so that these differences may reflect strong self-selection rather than something else.

Less than half of the senders judged their own comments as flames (44.2%), while the majority of comments were perceived by receivers as flames (60.3%). For senders, the judgment of a comment as a flame was associated most strongly with the statement that its purpose was to offend someone (Fisher's exact test, $p = .03$). However, 36.8% of the comments were judged to be either flames or intended to be offensive, but not both. Flaming was also weakly associated with the purpose of being provoking ($p = .08$), but surprisingly, a similar positive association was found with the purpose of providing information ($p = .08$). Receivers also more often judged comments as flames when they believed that the comments' intention was to be offensive (Fisher's exact test, $p = .04$).

Of all senders, 63.2% have given information about the reasons for their comments by using the open questions. A popular reason is that senders themselves felt offended or some perceived offense to others, to which they wanted to respond (22.1% of all senders). A typical explanation in this category was "because they were insulting somebody else first" (a 15-year-old girl from the UK). Also, some senders who did not mention being offended as a reason for their comments argued that flaming is not very special or rare on YouTube (4.2%).

Another popular reason given in the open questions was that the video was bad enough to legitimize very critical comments (13.7%). For example, a 34-year-old man from the US argued that he was "tired of people wasting my time with useless vids" and that he hoped that the poster of the video under attention "wont post useless videos again." Also, several senders accused video posters of using inaccurate video titles to get more views. Interestingly, one poster (a 22-year-old woman from the USA) of a video for which three flames had been selected, admitted to posting videos "in order to provoke people."

While most senders gave external reasons for their comments (e.g., other YouTube users being offensive or posting bad videos), a small number of senders (5.3%) admitted flaming for personal entertainment. A 31-year-old man from the USA typed "I like to stir the pot, and see if I can get a adverse reaction out of some random person."

There is no simple answer to RQ3d. There seem to be several reasons why people flame on YouTube, some of which seem to be more popular than others. It seems that giving an opinion and expressing disagreement are more popular reasons for flaming than is offending someone. Several senders explicitly mentioned the bad quality of a video or a misleading video title as a reason. Also, flaming was often done because commenters themselves felt offended. This provoked offensive reactions that were not meant to be hurtful only for the sake of being amusing. Rather, offending the offender felt justified for many people. This suggests that flaming on YouTube may often start without offensive intent from anyone but gets out of hand after some perceived offense. Some people also mentioned that flaming is very common on YouTube and that thus their behaviour is not special. Such answers are supportive of RQ3a but were not given very often. Finally, only a few participants showed that they found flaming to be an amusing activity, suggesting that flaming is generally not done for mere entertainment.

4. Conclusions and discussion

4.1. General conclusions

First, flaming is common on YouTube. Although most YouTube users indicate that they themselves do not flame, they do regularly perceive it.

Second, views on flaming are varied. Most YouTube users seem to think of it as something annoying that should be viewed as a negative side effect of freedom of speech rather than as an entirely evil phenomenon. While most users do not think of YouTube as a problem, a minority thinks otherwise. For some users, it is even a reason to refrain from uploading personal videos.

Several causes or reasons for flaming were found to be plausible. Conformation to perceived norms and reduced awareness of other people's feelings are two phenomena that may underlie flaming behaviour on YouTube. Additionally, while some YouTube users intentionally offend others for mere entertainment, most flaming seems to be meant to express disagreement or an opinion. Feeling disappointed by a video or feeling offended by either a video or another commenter were popular reasons for flaming. Miscommunication may also play an important role, although the results regarding this subject were inconclusive.

4.2. Limitations

The definition of flaming, although carefully formulated, may be too vague or difficult for some people. Judging whether comments are flames is extremely difficult. Certain words are usually thought to be indecent or offensive, but they can be harmless when senders and receivers understand that no offense is intended or taken. It is the overall hostility rather than the presence of profanity that defines flaming (Turnage, 2007). However, senders and receivers may have different views on comments (O'Sullivan & Flanagin, 2003).

Several participants in the general questionnaire mentioned that they did not fully understand what was meant by "flaming." Afterwards, it is difficult to decide whether this should be attributed to the vagueness of the definition or to the fact that participants may not have read the definition. Although the definition of flaming was given on the questionnaire page (and framed with a salient colour), some participants may still have missed it. On the other hand, the great majority of the respondents gave answers that were in line with the definition of flaming.

Also, while the term "offensive" seems to be a key word in the definition of flaming used in this study, no near-perfect correlations between offensive purpose or interpretation and the judgment of flaming were found. Some senders even indicated in answers to the open questions that a certain amount of offense had been intended, while still not judging their comments as flaming.

Altogether, the concept of flaming seems to be problematic in research. It is very subjective, and apparently people do not even always judge offensive comments as flames.

Another problem is the fact that active YouTube users (i.e., users who upload more videos or give more comments) had a better chance to be invited for participating in this research than passive users. For all three questionnaires, YouTube users were invited when they had uploaded a video or commented on a video. Although this is a major bias in the participant sample, it is not necessarily a problem for the goals of the present research. One could argue that it is the active YouTube users who are most interesting. Their views and experiences are more interesting than those of people who have YouTube accounts without uploading videos or commenting. Still, some conclusions must be interpreted more carefully because of this bias. For example, RQ2c addressed flaming as a reason for people not to post personal videos. The percentage of YouTube users actually refraining from posting videos because of flaming is probably larger than the one produced in this study, as these users are relatively passive YouTube users.

The questionnaires used for this research consisted mostly of multiple-choice questions, such that quantitative analysis could be performed. This yielded some problems, however. A few invited YouTube users replied that the questionnaire did not provide the opportunity to give exactly the right answers to questions. Also, the answer categories may have influenced the results. It is easy to imagine that people do not know exactly what they meant by a comment or how they interpreted one and that they selected the answers that seemed most acceptable to them. Open questions would have been more valid, but they would have yielded results that are much more difficult to analyze.

In fact, the open questions that were provided on the questionnaires were used by many participants. These questions may have provided the most interesting results, but it was difficult to decide in what way these results could be used.

4.3. Recommendations for future research

Reflecting on the present research, opponents of the term "flaming" may argue that flaming has once more been proven to be a problematic concept. Even with a carefully formulated definition, it is very difficult to decide whether comments are flames. Also, the judgment of flaming was far from perfectly correlated with one of its key aspects, being offensive. Indeed, opponents might conclude that another study has failed to correctly address flaming. Scholars interested in flaming might answer that, despite these fundamental problems, the current study has also shown that flaming is a very real phenomenon. Only a few participants indicated that they did not understand the concept, whereas a majority indicated seeing it often on YouTube. As found in earlier research by Lange (2007a, 2007b), many YouTube users think that flaming is a problem for others, and indeed, for a minority, it is. Flaming on YouTube is not only common; for some, it is even a problem. Instead of ignoring flaming because it is such a difficult concept, it can be argued that it is a very real phenomenon that is worthy of more extensive research.

With regard to its causes, the present study has not rejected any of the causes suggested by the literature. This may indicate that flaming does not have one single cause. Future research should investigate the different causes further.

Perceived flaming norms seem to play a role in the YouTube community. Future research should find ways to study the direction of this relation and to determine whether depersonalization plays any role. Without measures of depersonalization, it is difficult to ascribe these findings to processes predicted by the SIDE model (Reicher et al., 1995).

A rival explanation is provided by the Social Learning Theory (Bandura, 1977), which predicts that "seeing others engage in threatening or prohibited activities without adverse consequences can reduce inhibitions in observers" (p. 49). A difference between these explanations, which can be useful for future research, is that the SIDE model predicts that depersonalization leads not only to behavioural conformation but also to higher attraction of fellow group members (Lea et al., 2001), which Social Learning Theory does not predict. In fact, Baron and Kepner (1970) find that participants were less attracted to aggressive models compared to non-aggressive models despite generally imitating the modelled aggression. Moor (2007) also finds that participants who conformed to a flaming norm liked the flaming model less.

Miscommunication should also be investigated more thoroughly. The methods used for the present research were promising, but it is clear that large numbers of participants are needed. Sev-

eral interesting implications have been given, and these should be studied with more participants. Also, it is clear that many comments are not primarily aimed at video posters. Rather, comments on a video might be compared to discussion forums where people respond to each other and get back after some time to read replies from others. Hence, for future studies of (mis)communication on YouTube, more people than just the commenter and the video poster should be involved.

Ultimately, many comments on many videos could be compared to find patterns in comments. Perhaps flaming usually starts with either a disagreeing comment misinterpreted as being offensive (cf. McKee, 2002), with a user forgetting about someone's feelings (cf. Thompsen, 1994) or with one of the few YouTube users who like to flame for fun (cf. Levander, 1994). A "flame war" could then go on, simply because YouTube users who feel offended want to stand up for themselves or for others. From there, caused by the widespread occurrence of such flaming, many users may start thinking that this is a norm on YouTube, causing them to flame more often when they do not like videos (cf. Reicher et al., 1995). Other patterns of causes can also be imagined. The ultimate goal of future research would be to find how different causes of flaming interact, on YouTube as well as in other CMC contexts.

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