What drives people to participate in online firestorms?

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Abstract

Purpose – Social media empower individuals to voice their opinions about issues that they perceive to be unacceptable. When many others add their opinions and large quantities of messages containing negative word-of-mouth suddenly spread online, an online firestorm occurs. By extending the situational theory of problem solving (Kim and Grunig, 2011) into the domain of online communication, this study aims to identify the drivers for participating in online firestorms.

Design/methodology/approach – With reference to a fictitious online firestorm trigger (i.e. perceived moral misconduct) posted on Facebook, a qualitative pre-study and quantitative online survey were conducted. Based on the responses of 410 participants, an ordinary least squares regression was modeled to examine the factors of participating in the online firestorm. Later, structural equation modeling was applied to test the model and gauge its fit with the data.

Findings – Participants' involvement recognition, perception of being collective actors and approval of slacktivism behaviors positively predicted their participation in the online firestorm, whereas non-anonymity hampered it.

Originality/value – The study's findings not only contribute to the current understandings of online firestorms but are also valuable for developing theory and forms of professional crisis management. Moreover, they offer insights into the factors of online communication environments that encourage users to voice their opinions.

Keywords Social media, Online information, Problem-solving, Online firestorm, Online protest

Paper type Research paper

Introduction

When British scientist Dr. Matt Taylor gave an update on the European Space Agency's Rosetta mission at an important science event, he caused a stir on social media. However, the commotion was not because of what he said regarding the landing of a spacecraft on a comet, but because of what he wore at the public appearance: a shirt emblazoned with images of scantily clad women that many people found sexist and indicative of a culture of misogyny (Bell, 2014). The incident quickly generated its own hashtag on Twitter as individuals of all genders heavily criticized Taylor for his choice of clothing. Taylor's offensive shirt, which Taylor himself later apologized for wearing (Meikle, 2014), incited what Pfeffer *et al.* (2014) have termed an *online firestorm*, defined as a "sudden discharge of large quantities of messages containing negative word-of-mouth and complaint behavior against a person, company, or group in social media networks" (p. 118). Conceptually, online firestorms share features with rumors, which are also passed along from person to person, usually by word-of-mouth (Allport and Postman, 1947). Unlike rumors, however, online firestorms can be based on rumors (i.e. unconfirmed) or actual events (i.e. confirmed), and the negative comments in them are predominantly opinions, highly affective and often offensive in nature (Pfeffer *et al.*, 2014). An example of such comments was the tweet of Rose Eveleth, a journalist

at *The Atlantic*, in response to Dr. Taylor's public appearance: "Thanks for ruining the cool comet landing for me a–hole" (Young, 2014).

For the person, group or organization under fire, such online outrage can be a viable threat to reputation, especially when seized by mainstream media, as in Dr. Taylor's case. For activists, by contrast, an online firestorm can be a tool for raising awareness about perceived misconduct and for exerting pressure on the perpetrator to alter his or her behavior. For people who become aware of the problem and perceive it to be relevant, participating in an online firestorm is a way to vent anger, show indignation and, by joining in the protest with a host of others, contribute to solving the perceived problem. Thus, gaining insights into that rather new phenomenon in online information exchange can benefit not only academic researchers but also the various entities involved in public communication.

To date, scholars interested in the topic have focused on the structural elements that foster online firestorms (Pfeffer *et al.*, 2014), how mainstream media report on them (Einwiller *et al.*, 2017), how they develop and are exploited by counterpublics on Twitter (Jackson and Welles, 2015; Wang *et al.*, 2016) and how organizations can best manage them on social media (Hauser *et al.*, 2017). By comparison, little research has focused on individuals' motivation to participate in online firestorms. Based on the concept of moral panics, Johnen *et al.* (2018) conducted an experiment to observe the roles of certain factors that embolden people to engage in online firestorms and concluded that their participants were driven by a moral compass and a desire for social recognition. Nevertheless, we argue that the collective nature of that form of "crowd-based outrage" (Rost *et al.*, 2016, p. 2), as the core element of online firestorms, has not yet received the attention that it warrants. After all, social media are platforms that facilitate collective action (Obar *et al.*, 2012), and via collective protesting online, people can establish a collective identity and a sense of collective efficacy in raising awareness about, organizing and promoting a desired social change (Kavanaugh *et al.*, 2005). In fact, the majority of firestorms covered by journalists in mainstream media have aimed at societal change by addressing events of perceived discrimination and moral misconduct (Einwiller *et al.*, 2017). However, whereas a person's individual moral compass has been shown to contribute to his or her motivation to participate in an online firestorm (Johnen *et al.*, 2018), the roles of collective factors, such as the individual's sense of collective identity and collective efficacy, have remained largely unexamined.

With our study, we extend the rather limited research to date on participation in online firestorms. Following from the notion that a motivational state to solve a problem underlies people's communicative action (Kim and Grunig, 2011), we developed and empirically tested a theoretical model that sheds light on the factors that drive participation in online firestorms on social media. As a result, this article makes three key contributions to knowledge on the topic. First, it elaborates upon what motivates people to engage in online firestorms by illuminating the roles of the collective aspects of the communication behavior. Second, it highlights not only the drivers but also the constraints of people's participation in online firestorms. Third, with reference to the situational theory of problem-solving (STOPS; Kim and Grunig, 2011) adapted to the online sphere, it discusses the theory's applicability to online communication behaviors and extends it into collective communication behaviors on social media. In our study, we used a fictitious but realistic case stimulus of a businessman's misogynous comment on Facebook to test our hypotheses with data collected from a survey of 410 internet users. Given the importance of online firestorms not only for the performance of organizations and their representatives but also for publics as a way to demand responsibility for perceived misconduct (Jin *et al.*, 2014) and demand change (Einwiller *et al.*, 2017), it is worthwhile to study what influences people to engage in them.

Online firestorms

The development of the networked information environment has greatly empowered individuals to actively participate in the public sphere (Benkler, 2006). In particular, free access to a plethora of online communication platforms has changed people's possibilities for participating in open discourse, and classical forms of protest such as demonstrations and petitions are now also, if not only, enacted in the digital world. When an online protest takes the form of a sudden onslaught of countless messages containing negative word-of-mouth and complaint behavior, it becomes an online firestorm (Pfeffer *et al.*, 2014). Pfeffer and colleagues have identified several features of online firestorms, including the speed and volume of communication, binary choices, network clusters, unrestrained information flow, lack of diversity, cross-media dynamics and network-triggered decision processes. Moreover, they have highlighted the affective nature of online firestorms, as reflected in the intense level of indignation frequently contained in their messages. Apart from posting messages to express their outrage and indignation, users can participate in an online firestorm by liking or sharing its messages and thereby contributing to the virality of its content.

Online firestorms can and often do contain elements of other forms of aggressive online behavior, including flaming – that is, "hostile emotional expressions characterized by using insulting, profane, or offensive languages" (Cho and Kwon, 2015, p. 364) – and hate speech, which attacks the social identity of a group or person in a humiliating way (Boeckmann and Liew, 2002). However, relative to those forms of aggressive and emotional commenting on social media, an online firestorm is by definition always a collective activity. Milan (2015) has introduced a similar term, *cloud protesting*, in which the cloud "designates a digital imagined space where soft resources vital to collective action are stowed and experienced by participants" (p. 893). The cloud doubles as a metaphor for the creation of meaningful connections among individuals in instances of collective action on social media, where users' posts and visual content become the building blocks of the collective identity (Milan, 2015).

Given the high number of negative comments, likes and shares that they involve, online firestorms as the collective form of protest can be especially effective in exerting pressure and bringing about the intended change. In fact, when the messages of frustrated customers or other publics go viral, it is nearly impossible for the entity under fire (e.g. a company) to stop them (Grégoire *et al.*, 2015). Thus, an online firestorm against a company represents a real threat that can result in a corporate crisis when it raises concerns among stakeholders (Coombs and Holladay, 2012). By extension, Mukkamala *et al.* (2015) have even characterized online firestorms as indicators of viable corporate crises on social media.

In their study on strategies for managing online firestorms, Hauser *et al.* (2017) examined the specific conditions under which a firestorm arises. With reference to an agent-based simulation model, they concluded that the conflict management style of a targeted company needs to be adjusted to accommodate individual-level characteristics of firestorm participants as well as community-level ones – that is, the firestorm community's social structure, including its overall sentiment. Building upon those observations, knowledge about what kind of individual- and community-level factors incite people to participate in online firestorms should provide instructive insights into ways of handling the phenomenon.

Situational theory of problem solving (STOPS)

At the core of any online firestorm is a perceived problem that agitates people to express outrage. The problem may prompt an act of communication (e.g. liking, sharing or making comments) to achieve a certain goal – for instance, raising awareness about an issue and effecting social change in the long term (Einwiller *et al.*, 2017). That such communicative action is motivated by problem-solving is a key assumption in Kim and Grunig's (2011) STOPS. As researchers have suggested (Einwiller *et al.*, 2017; Rost *et al.*, 2016), the problems

that people seek to solve by participating in online firestorms are often societal in nature, including perceived injustices, social deficiencies and misconduct. By contributing to the online outrage, people attempt to enforce the social norms that they perceive to have been violated and to effect the social change that they desire. Thus, we characterize participating in an online firestorm as a communicative action of problem-solving performed by forwarding or sharing problem-related information via likes, shares or comments. According to STOPS, the motivation to execute such communicative action is influenced by a person's problem recognition, constraint recognition and involvement recognition.

Problem recognition
Recognizing a problem is a prerequisite for one's motivation to solve it and engage in communicative action to that end. Shared problem recognition is also a central, definitive aspect of any given public (Kim *et al.*, 2010). In conceptualizing the types of problems, Kim and Grunig (2011) have distinguished perceptual problems from cognitive ones; whereas one of the former indicates a "perceptual discrepancy between expected and experienced states," one of the latter signifies "the absence of a readymade solution to a perceptual problem" (p. 128). By extension, they incorporated both types of problems in their conceptualization of problem recognition, which highlights that cognitive problems generally follow perceptual ones.

Similarly, drawing from the concept of moral panics, Johnen *et al.* (2018) have suggested that a person's willingness to participate in an online firestorm is driven by his or her so-called "moral compass." If the problem is perceived to violate the person's sense of morality – that is, the person experiences a perceptual discrepancy between expected and experienced states – then he or she is inclined to participate in the protest. Thus, our first hypothesis reads:

H1. Problem recognition positively relates to participating in an online firestorm.

Constraint recognition
A constraint represents an obstacle that hinders a person from intervening in a problematic situation. When it comes to expressing opinions online, one factor that may discourage communicative actions is non-anonymity. In past research, individuals were more willing to express their viewpoints in anonymous online scenarios than in non-anonymous ones (Porten-Chée and Eilders, 2014), especially when a person's opinion deviated from the prevailing one in the corresponding virtual community (Luarn and Hsieh, 2014). By contrast, after initiating online petitions allowing either anonymity or not, Rost *et al.* (2016) found that people were more likely to participate non-anonymously; however, it should be remembered that online petitions represent a special type of online outrage in which disclosing one's name is usually required. Considering all of the above, we hypothesize that in social media environments (e.g. Facebook) where using real names is a requirement, non-anonymity restrains participation in online firestorms:

H2.1. Non-anonymity negatively relates to participating in an online firestorm.

Another factor that may restrain individuals' inclination to express their opinions online is their lack of familiarity with other members of the online community, or *member unfamiliarity*. Researchers have shown that people are more likely to express their opinions with familiar others (e.g. friends and family members) than with strangers (Crandall and Ayres, 2002; Moy *et al.*, 2001). On top of that, in online contexts, people who appeal to groups of familiar others are more willing to express inconsistent opinions than when group members are unfamiliar (Luarn and Hsieh, 2014). On Facebook, for instance, users often accrue several hundred so-called "friends" but are unlikely to actively connect with each of

them (Tong *et al.*, 2008). The result is an online environment in which users are unfamiliar   Participation in
with most of their connections, which should hamper their inclination to engage in online   online
firestorms: firestorms

H2.2. Member unfamiliarity negatively relates to participating in an online firestorm.

Involvement recognition

Involvement generally refers to how personally relevant a problem is for an individual or,
according to Kim and Grunig (2011), how connected a person feels to the problematic
situation. Proposing that involvement is an important motivator of advocacy behavior,
Choi *et al.* (2011) found that an individual's attitudinal basis concerning an issue predicts
his or her behavior. Furthermore, the person's level of involvement affects his or her
communication behavior regarding certain issues (Heath and Douglas, 1990). Thus, a high
level of involvement should foster communication behaviors when people perceive
misconduct:

H3. Involvement recognition positively relates to participating in an online firestorm.

Factors facilitating participation in online firestorms

In STOPS, factors influencing communicative action as part of problem-solving are
necessary but do not sufficiently explain participation in online firestorms. In particular, we
hypothesize that the collective nature of online firestorms is an important factor facilitating
participation. Compared to individual activity, the activity of an online collective can draw
from the soft resources stowed in the cloud, and people can connect with likeminded others
to exert their influence over the issue (Milan, 2015). When participating in online firestorms
from their homes, people can exert that influence without much effort. Thus, we propose to
extend STOPS by adding three factors: slacktivism, collective identity and community
efficacy.

Slacktivism

While activities such as constructing protest websites to mobilize mass audiences against a
company (Ward and Ostrom, 2006) represent active online advocacy, social media also allow
for more passive forms of online activism. To describe them, Rotman *et al.* (2011) coined the
term *slacktivism*, defined "as low-risk, low-cost activity via social media, whose purpose is to
raise awareness, produce change, or grant satisfaction to the person engaged in the activity"
(p. 821). Activities representing slacktivism include clicking the "Like" icon on Facebook to
demonstrate support for an interest group, forwarding or sharing information about an issue
and even altering the color of one's profile picture to show solidarity (Lee and Hsieh, 2013).
Of course, activities such as liking or sharing content or posting short comments on social
media do not require much effort or commitment (Porten-Chée and Eilders, 2014). In fact,
Porten-Chée and Eilders (2014) found that in low-threshold online scenarios that facilitate
effortless opinion expression such as by clicking the "Like" button on Facebook, people
are more willing to speak out than in face-to-face settings. Thus, slacktivism should facilitate
participation in online firestorms:

H4.1. Slacktivism positively relates to participating in an online firestorm.

Collective identity and community efficacy

Sharing information about a problem not only raises perceptions of the problem but also
contributes to a sense of belongingness. Indeed, researchers have repeatedly shown that a top

motivation for using social media is to satisfy social needs (e.g. Pang, 2018), meaning that information exchange may not necessarily aim at solving a problem but at creating a sense of community instead (Kim *et al.*, 2010). Social media such as Facebook help users to achieve that goal, for they "serve to create an alternative public sphere that facilitates an online 'imagined community'" (Harlow and Harp, 2012, p. 198).

Community-building seems to play a vital role in the online complaint behavior of consumers that has given rise to "a community of discontent" (Ward and Ostrom, 2006, p. 220). In his review of literature addressing social movements, Garrett (2006) has discussed the reduction of participation costs, the promotion of collective identity and the creation of community as mechanisms that potentially link technology and participation. In that process, collective identities become manifest when egocentricity dissolves into collectivism (Milan, 2015), which in turn inspires commitment among members of the collective. Melucci (1996) has defined *collective identity* as "an interactive and shared definition produced by a number of individuals . . . concerning the *orientations* of their action and the *field* of opportunities and constraints in which such action is to take place" (p. 70).

Although social media have been viewed as "tools for facilitating forms of collective action" (Obar *et al.*, 2012, p. 20), those actions are nourished by the stowed resources (Milan, 2015) of its imagined communities, which are perceived as spaces of assembled power. Consequently, collective online actors perceive themselves as being powerful and effective. In the context of online complaining, Willemsen *et al.* (2013) have provided evidence that complainers are not only motivated by the opportunity to vent and be altruistic but also by a feeling of empowerment. By extension, we suggest that the perception of being part of a powerful collective and the resulting perception of *community efficacy* motivate individuals to participate in online firestorms:

H4.2. Collective identity positively relates to participating in an online firestorm.

H4.3. Community efficacy positively relates to participating in an online firestorm.

Based on our derived hypotheses, we propose a model including seven drivers of participation in online firestorms (Figure 1). To test the model, we conducted a qualitative pre-study followed by a quantitative survey.
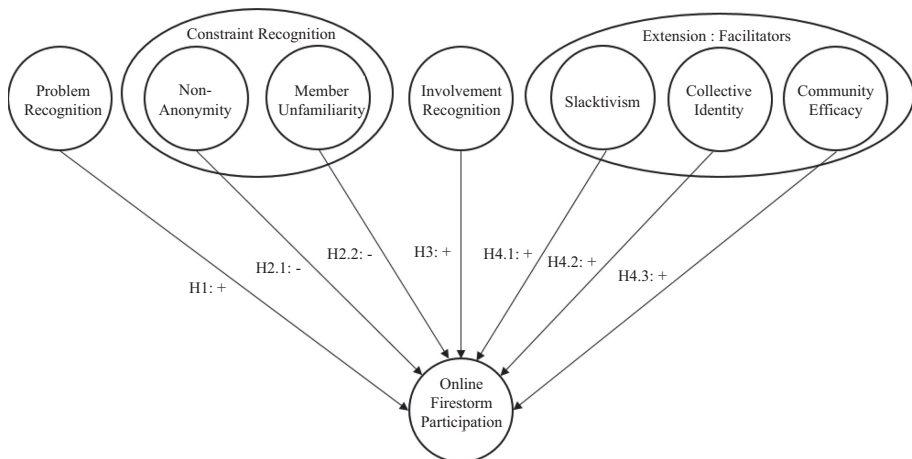
Figure 1.
Theoretical model of online firestorm participation

Qualitative pre-study

We used Flanagan's (1954) critical incident technique to gain initial insights into the factors driving or hindering participation in online firestorms. In extending Kim and Grunig's (2011) STOPS into the sphere of social media, we adopted their tested and validated concepts as much as possible and used their measurements for problem recognition and involvement recognition. However, we modified their construct of constraint recognition for the social media context. The additional facilitating factors, which we introduced so that STOPS could be applied in a social media environment, were derived from recent literature, and their relevance was tested in the qualitative pre-study.

For the pre-study, in which we asked people to reflect upon several predefined scenarios, we recruited 29 participants via convenience sampling: 14 men or young men, 14 women or young women and one of undeclared gender, all aged from 14 to 34 years old. Each participant was presented with one of three online firestorm scenarios developed with reference to Einwiller *et al.*'s (2017) typology of online firestorm stimulants. The participants were asked to imagine that they were scrolling through their Facebook newsfeed and suddenly stumbled upon a post – the post that has triggered an online firestorm – followed by three more posts depicting the firestorm's evolution in terms of increased number of likes, shares and comments; the accumulation of opposing opinions; and the heightened use of offensive language. After reading through the scenario, the participants were asked whether they would like, comment on or share the post, and to elaborate on why they would or would not do so.

Following Flanagan's (1954) critical incident technique method, participants' behavior was categorized as a critical incident whenever the participants stated that they would or would not react to the scenario and when they sufficiently elaborated upon their rationale. As a result, we accumulated 140 critical incidents. Drawing on Mayring's (2004) procedure for qualitative content analysis, we coded all incidents deductively based on a predefined codebook that was supplemented by inductively derived categories.

Analyses revealed a distinct tendency of the theoretically derived factors to either support or hinder communicative actions in online firestorms. Whereas problem recognition, familiarity with users, low costs of acting (i.e. slacktivism), the perception of the online community as being powerful and the perception of being a collective actor positively related to participants' engagement in the firestorms, non-anonymity was a hindering factor. Furthermore, analyses revealed that though some participants felt highly involved and highly aware of the problem, they decided not to participate in the firestorm because they perceived that offline actions (e.g. boycotting) would be more effective.

Based on those results, we proceeded with the variables proposed by STOPS and the additional facilitators for our subsequent quantitative investigation. The qualitative data were additionally used to operationalize constructs without suitable measures available in the literature for the context under study.

Survey
Research design

During the survey, the participants encountered a fictitious online firestorm inspired by real-world firestorms. Involving a case of alleged moral misconduct (Einwiller *et al.*, 2017), the firestorm was introduced to participants by way of an online news article describing how the owner of a clothing store selling high-priced apparel insisted on employing only women as salespeople based on the rationale that sex sells. After encountering the article, the participants were presented with an artificially created online firestorm that had allegedly evolved on Facebook as a result of the store owner's sexist comments. After reading the stimulus material, the participants were asked to answer questions that measured the variables of interest.

Sampling

A crowdsourcing platform was used to recruit participants complemented by snowball sampling among acquaintances of the authors. Ultimately, 267 respondents completed the survey via crowdsourcing, whereas 143 additional participants were recruited via snowball sampling, for a total of 410 usable cases of persons who use social networking sites at least occasionally. According to Kline's (2011) suggestion to have 10 to 20 respondents per estimated parameter, this sample size is sufficiently large. Even though using a crowdsourced sample may not afford results that are generalizable to the whole population (Paolacci and Chandler, 2014), it is suitable for hypothesis testing. On that topic, scholars have argued that a theory can be tested with a non-representative sample to investigate hypothesized processes that would also hold true in the general population (Basil *et al.*, 2002). The quasi opt-in panel used in our study is thus justifiable for exploring multivariate relationships between the variables informed by theory (Li, 2008). Researchers have also shown that crowdsourcing platforms yield reliable, high-quality data (Peer *et al.*, 2015), which holds true not only for experiments (Paolacci *et al.*, 2010) but also for survey-based research (Behrend *et al.*, 2011; Buhrmester *et al.*, 2011).

Measures

Unless indicated otherwise, measures were taken from Kim and Grunig's (2011) STOPS, and items were modified to suit the context under study. Additional measures (control variables) were used to incorporate the findings of the qualitative pre-study. All answers were quantified on six-point scales (1 = *strongly disagree*, 6 = *strongly agree*), and indices were created by averaging answers to the respective items. All measures are listed in Appendix.

Key variables

Participation in the online firestorm. The dependent variable was operationalized as individuals' willingness to participate in the online firestorm by forwarding or sharing information about the recognized problem (Kim and Grunig, 2011). It was measured by asking the participants to indicate their inclination to participate by liking, sharing and commenting on content on Facebook. Two-item composite scales were used to measure each form of participation, and an overall index of participation in the firestorm was constructed from all six items (Cronbach's α = 0.90).

Problem recognition. Based on the definition of problem recognition provided by Kim and Grunig (2011), the participants were asked three questions to assess whether they perceived the issue underlying the online firestorm to be a serious one. To improve internal reliability, the index was created from two items only (Spearman–Brown = 0.81).

Constraint recognition. To measure non-anonymity, we drew from Pissarra and Jesuino's (2005) and Lu and Bol's (2007) research. The participants were asked to indicate whether non-anonymity in their Facebook environment represented an obstacle for them to communicate on Facebook about the problem raised by the online firestorm. The measure for member unfamiliarity, borrowed from Adams *et al.* (2005) and Lu and Bol (2007), asked the participants whether non-familiarity with their Facebook network hindered them from taking communicative actions in the given scenario. Three items were used to measure each variable (Cronbach's α for non-anonymity = 0.83, Cronbach's α for member unfamiliarity = 0.82).

Involvement recognition. Involvement recognition was measured by asking the participants three questions about whether the issue affected them personally or people whom they care about (Cronbach's α = 0.92).

Slacktivism. To measure slacktivism, the participants were asked three questions regarding their approval of engaging in effortless activism behaviors on Facebook (Harlow and Harp, 2012; Hu, 2014). To improve internal reliability, the final index was constructed by averaging the responses to two questions only (Spearman–Brown = 0.79).

Collective identity. Collective identity was operationalized as one's perception of being a collective actor in response to the respective issue and contributing to the discussion about it in the Facebook community. Three questions were adapted from Luhtanen and Crocker (1992) and Peterson *et al.* (2008) and had a Cronbach's alpha of 0.85.

Community efficacy. Items measuring participants' perception of the Facebook community as being powerful in advancing solutions to the problem were based on Gibson *et al.* (2000), who used variations of Bandura's (1986) scale to measure group efficacy. Following Brunsting and Postmes (2002), additional items were adapted from Klandermans's (1984) expectancy value approach (Cronbach's $\alpha = 0.85$).

Control variables
Personal attributes. Certain personality traits influence individuals' inclination to post comments in online settings (e.g., Nekmat; Gonzenbach, 2013). Following Nekmat and Gonzenbach (2013), we controlled for individual outspokenness and willingness to self-censor. To measure outspokenness, the participants answered three questions about their inclination to post their opinions on Facebook regardless of what their Facebook friends may think of them. For reasons of internal reliability, the final index was constructed by averaging responses to two items only (Spearman–Brown = 0.71). By contrast, willingness to self-censor was assessed by other three questions regarding participants' tendency to withhold their true opinions on Facebook (Cronbach's $\alpha = 0.89$).

Social media use. Social media use was measured by asking the participants how frequently they used social media platforms such as Facebook and Twitter.

Demographics. Three demographic control variables were assessed: age, gender and highest level of education attained. The average age in the final sample was 34.25 years ($SD = 12.62$), and 42 percent of the participants were women or young women, which was coded as 0, whereas being a man or young man was coded as 1. Last, highest level of education attained was coded on eight levels; the median level in the final sample was junior high school.

Results
Data were analyzed in two steps. First, a hierarchical ordinary least squares regression was modeled to examine the factors related to participating in an online firestorm. Several control variables assumed to influence the dependent variables – personal attributes, social media use and demographics – were added to the equation. The second step involved structural equation modeling, which is superior compared to analyzing causal relationships with regression analysis because it fulfills the necessary preconditions for analyzing complex relationships between latent variables and testing all hypotheses simultaneously while considering measurement errors and testing the overall model fit.

Ordinary least squares regression analysis
Table I gives an overview of the results of ordinary least squares regression. H1, which proposed a positive relationship between problem recognition and participating in the online firestorm, had to be rejected ($\beta = -0.044$, $p > 0.1$). By contrast, H2.1 and H2.2 predicted that non-anonymity and member unfamiliarity are negatively related to participation in an online

	Online firestorm participation
Step 1: Demographics	
Age	−0.029
Gender (female = 0)	0.071*
Education	−0.062[#]
Nationality (Germans = 0)	−0.056
ΔR^2	2.0%
Step 2: Social media use	
Frequency of social media use	−0.048
ΔR^2	0.8%
Step 3: Personal attributes	
Individual outspokenness	0.038
Willingness to self-censor	0.005*
ΔR^2	9.8%
Step 4: Determinants participation	
Problem recognition	−0.044
Non-anonymity	−0.105*
Member unfamiliarity	0.074[#]
Slacktivism	0.083[#]
Involvement recognition	0.146**
Collective identity	0.554***
Community efficacy	0.050
ΔR^2	43.3%
Total R^2	55.9%

Note: Sample size (N) = 410. Cell entries are final-entry standardized beta coefficients (β) from hierarchical OLS regression analyses. Missing values were replaced with the mean. [#]$p < 0.1$. *$p < 0.05$. **$p < 0.01$. ***$p < 0.001$ (two-tailed)

Table I.
Regression model predicting online firestorm participation

firestorm. The data supported H2.1 by indicating a negative relationship between non-anonymity and such participation ($\beta = -0.105$, $p < 0.05$); however, contrary to H2.2, our results indicated a positive association between member unfamiliarity and participation in the firestorm, although the effect was only marginally significant ($\beta = 0.074$, $p < 0.1$). Next, as proposed by H3, involvement recognition was indeed positively related to participation in the firestorm ($\beta = 0.146$, $p < 0.01$). In line with H4.1, the data indicated a positive relationship between slacktivism and participation in the firestorm, albeit only a marginally significant one ($\beta = 0.083$, $p < 0.1$). In support of H4.2, a strong positive association surfaced between collective identity and participation in the firestorm ($\beta = 0.554$, $p < 0.001$). However, counter to H4.3, the data indicated no association between community efficacy and participation in the firestorm ($\beta = 0.050$, $p > 0.1$). All told, the model accounted for 55.9 percent of total variance (total $R^2 = 0.559$, $p < 0.001$).

Structural equation modeling
To more stringently test the proposed model (Figure 1), structural equation modeling was performed with the software AMOS. In the process, we relied on commonly used fit indices (Kline, 2011) to evaluate the model data fit. Because the chi-square test of the hypothesized model was significant ($\chi^2 = 827.57$, df = 21, $p < 0.001$), the model was refined to improve its fit. Respecification was guided by the results of the preliminary analyses and the modification indices suggested by AMOS (Byrne, 2016). In line with the results of regression analysis that certain insignificant variables should not be considered for the model and based on the

modification indices, non-significant exogenous variables and respective paths were consecutively dropped. Additionally, suggested covariances were examined and added when relationships between the variables were theoretically justifiable. That procedure induced changes in the chi-square indices and improved the model fit, for a χ^2 value of 2.46 with 3 degrees of freedom ($p = 0.483$). Goodness of fit indices suggested that the data fit the modified model well: root mean square error of approximation (RMSEA) = 0.000, comparative fix index (CFI) = 1.000, Trucker–Lewis index (TLI) = 1.003, standardized mean square residual (SRMR) = 0.026.

Depicted in Figure 2, data revealed that collective identity was the strongest driver of participation in the online firestorm ($\beta = 0.557$, $p < 0.001$), followed by a person's involvement recognition ($\beta = 0.145$, $p < 0.001$). The results furthermore indicate that the non-anonymous Facebook environment slightly hampered participation in the firestorm ($\beta = -0.071$, $p < 0.05$), whereas a positive attitude toward slacktivism exerted a positive influence ($\beta = 0.091$, $p < 0.05$).
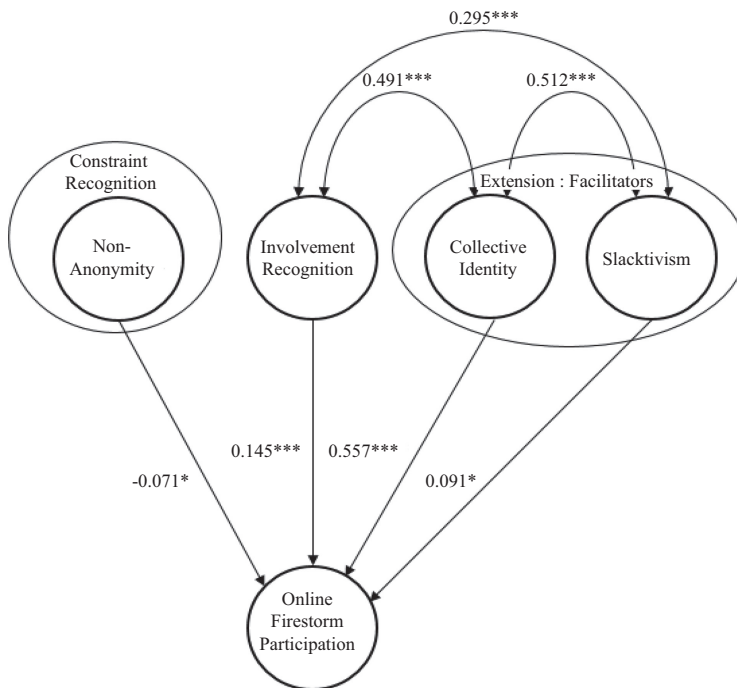
Note: Sample size (N) = 410. Path estimates are standardized beta coefficients (β) from SEM analyses. The effects of control variables, i.e. demographics (age, gender, education, nationality), social media use and personal attributes (individual outspokenness, willingness to self-censor), on endogenous and exogenous variables were residualized. Missing values on variables were replaced with the mean. Model goodness of fit: $\chi^2 = 2.46$, $df = 3$, $p = 0.483$; RMSEA = 0.000, CFI = 1.000, TLI = 1.003, SRMR = 0.026. Explained variance of online firestorm participation $R^2 = 48.6\%$. This model was bootstrapped based on Monte Carlo simulation with 10,000 bootstrap samples and a 90% bias-corrected confidence interval
*$p < 0.05$. ***$p < 0.001$ (two-tailed)

Figure 2.
Revised structural
equation model of
online firestorm
participation

Discussion

To determine what drives people to engage in online firestorms – that is, large quantities of messages containing negative word-of-mouth that suddenly spread online (Pfeffer *et al.*, 2014) – we drew from STOPS (Kim and Grunig, 2011) and expanded it with factors specific to the sphere of social media. Although the results of our online survey only partly supported the relevance of the drivers suggested by STOPS, they also revealed that the facilitators added for the context under study were particularly useful in explaining people's engagement in online firestorms.

In particular, our survey data did not show that problem recognition influenced people's willingness to participate in an online firestorm concerning the moral misconduct of a store owner. However, when people considered the store owner's sexist comments against women to be personally relevant, they were more inclined to participate in the firestorm. Such findings stress the role of involvement and an issue's personal relevance in people's participation in online firestorms. The results of our qualitative pre-study, however, partly contradicted that finding by showing that both problem and involvement recognition motivated participation in online firestorms. The methods used may partly explain that discrepancy. In the qualitative pre-study, the participants were prompted to carefully reflect on their potential social media behavior and write down their thoughts, whereas ones who participated in the survey were more likely to not over-engage in such contemplation. However, the latter, cursory action seems to better resemble people's state of mind when scrolling through their Facebook newsfeeds. Thus, the survey was perhaps better suited to gauge people's willingness to participate in online firestorms.

Notably, the strongest driver of participation in an online firestorm was the perception of being a collective actor: a community-based and community-oriented feeling nurtured by uniting around a personally relevant issue that strongly drives participation online. Thus, as Kim *et al.* (2010) have mentioned, creating a sense of community may be even more important when exchanging information than actually solving the problem at hand. Interestingly, the perception of such a collective to be efficacious did not influence participation in the firestorm. That result could indicate that the positive feeling of belonging to a group does not derive from the collective's associated accumulation of power but from the idea that getting involved is what truly matters, a notion that is often critically associated with slacktivism. On that note, it is unsurprising that a positive attitude toward slacktivism facilitated participation in the online firestorm. The non-anonymity of the Facebook environment, by contrast, somewhat hampered participation.

Our results also extend previous findings about participating in online firestorms. By underscoring the importance of collective identity as a driver of such participation, our findings elaborate upon Johnen *et al.*'s (2018) observations in important ways. Whereas their research revealed that the desire for social recognition as an individual ranked among the chief drivers of participating in online firestorms, we have stressed the importance of people's desire to be part of a collective. Johnen *et al.* (2018) also demonstrated that individual willingness to take part decreased as the number of participants rose, presumably because the likelihood of being socially recognized for one's participation drops as more people participate. However, we have shown that dynamic is only part of the phenomenon, because people are just as driven by their desire to be part of a community committed to raising awareness about an issue near and dear to them.

Therefore, in relation to our goal of testing and expanding Kim and Grunig's (2011) theory, our findings clearly show that STOPS needs to be adapted when applied to study social media contexts. Although the theory is highly suitable for explaining communication behavior in the offline world, the additional facilitators derived from the literature and our qualitative pre-study – namely, collective identity and slacktivism – emerged as crucial

extensions of STOPS in a social media environment. That finding can contribute not only to the development of theory but also to practice.

The implications of our findings for practice are especially interesting in relation to activism. For activists, who generally aim to raise awareness about an issue and exert pressure on a perceived transgressor, our findings suggest that it is important to appeal to people's sense of community, which can be achieved by addressing the community's role in exerting change via posts. Creating symbols of collective identity (e.g. an icon) may also be effective in mobilizing people to participate in an online firestorm. For the entities under attack, our findings indicate the importance of being vigilant and possibly stealing the firestorm's thunder by responding to posts in an accommodating way. At the same time, our findings also indicate that users who are mobilized to participate in online firestorms may not be the ones who seriously aim to harm the organization or person charged with the misconduct, for neither the notion of being an effective collective actor nor the perception that the problem is serious and unexpected motivates them to participate. Nevertheless, given the great number of people involved in online firestorms and the persistent threat of spillover into other online or mainstream news media, the risk to reputation can be a clear threat.

Limitations and future research

Despite including notable findings, the overall results of our research need to be seen in light of certain limitations. For one, the primary study involved using only one type of firestorm as a stimulus and therefore could not account for differences in participants' reactions to other types of online firestorm triggers such as perceived market misconduct and perceived violation of honor or reputation (Einwiller *et al.*, 2017). Similarly, because the study's design only accommodated the characteristics of online firestorms on Facebook, the findings should not be generalized to other social media platforms.

Regarding the external validity of the results, although the stimulus was created to be as realistic as possible, data collected via a survey cannot be presumed to indicate participants' usual routines when browsing social networking sites. It, thus, remains unclear whether participants would have noticed the firestorm trigger and how often they would have confronted it while scrolling through their Facebook newsfeeds. In the future, researchers should, therefore, address those limitations by assuring higher external validity with a method that enables participants to use their own social media accounts and assess their reactions in their accustomed online environment. Moreover, it would be revealing to examine differences depending on various firestorm triggers and to compare participants' willingness to participate on different social networking sites.

Researchers should also consider probing the explanatory nature of platform-specific communicative affordances. For instance, Facebook users have an array of possible ways to react to firestorm postings, including not only liking, commenting on and sharing posts, but also using emoticons, sending private messages and tagging friends. After all, evidence suggests that social endorsements such as recommendations and ratings influence individuals' behaviors in online environments (Messing and Westwood, 2012).

Last, it would be interesting to explore the role of the cultural and linguistic context in which an online firestorm occurs. From an intercultural perspective, investigating the difference in motivation to participate in firestorms in collectivistic versus individualistic cultures could prove highly revealing. From a linguistic perspective, by some contrast, it should be considered that the term used for the phenomenon varies from language to language. For example, in German-speaking countries, an online firestorm is called a "shitstorm," a foul metaphor borrowed from the English language (Einwiller *et al.*, 2017). Williams (2013) found that metaphors as rhetorical devices shape the meanings that audience members assign to news and have the capacity to influence their individual decision-making.

Einwiller *et al.* (2017) even speculated that journalists in German-speaking regions are more enticed to report on phenomena such as online outrage, simply because they have a suitable metaphor at hand. Because that dynamic may also apply to internet users' motivation to participate in online firestorms, scholars should address participation in online firestorms from a linguistic perspective as well and compare language-based regions according to the different metaphors used to describe the phenomenon there.

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Appendix: Measures

Online firestorm participation

Liking

I would express my agreement by liking the post or one of the comments.

I would like the post or one of the comments because I think it is appropriate.

Sharing

I would enjoy opportunities to educate others on this issue by sharing the post.

I would make sure my friends know about this issue by sharing the post or tagging them.

Commenting

I would post my opinion and experience on this issue by commenting upon the post.

I would participate in conversations about this issue by commenting upon the post.

Problem recognition

I consider this to be a serious issue.

This issue is something I did not expect (excluded).

Something needs to be done to prevent such issues.

Constraint recognition

Non-anonymity

Because I am not anonymous on Facebook, I would be afraid to talk with others about it.

I would not want strangers on Facebook to know my opinion on this issue without being in direct contact with them.

I would not contribute to the discussion on this issue because I do not want to expose myself and my opinion on Facebook.

Member unfamiliarity

I would not talk with my Facebook friends about this issue because I do not know most of them very well.

I would not talk on Facebook about this issue because my Facebook friends can associate my comments with me.

I would not talk on Facebook about this issue because I cannot identify with them.

Involvement recognition

Level of involvement

I think this problem affects my life and me personally.

I am connected with this problem and its consequences.

This problem has certain consequences for my life or someone close to me.

Participation facilitators

Slacktivism

By liking, sharing, or commenting on a post, I can help to address and uncover social evils.

Expressing agreement on Facebook by liking, sharing or commenting on a post is an appropriate way to engage with socially relevant topics.

I would rather take a stand on such issues on Facebook than participate in a boycott (excluded).

Community efficacy

It is good to contribute to such reactions on Facebook because the Facebook community can find a solution for this problem.

The opinions and voices of the Facebook community about the problem can exert pressure on those responsible in government and corporations.

It is important that I take part in the action, because in doing so, I support the Facebook community in accomplishing its goal.

Collective identity

I would contribute to the discussion on this issue because I regard myself as a worthy member of the Facebook community interested in the problem.

I perceive it positively that a group of people has connected on Facebook and is committed to raising awareness about this important issue.

I believe it is necessary to react to such postings even though they have already received many likes, shares and comments.

Personal attributes

Individual outspokenness

I will post my opinions on Facebook regardless of what my Facebook friends think of them.

I will post my opinions on Facebook even if I think my Facebook friends hold different opinions.

I stand by my opinions on Facebook even if I think my Facebook friends are against them (excluded).

Willingness to self-censor

There have been many times when I thought that my Facebook friends were wrong, but I did not let them know.

If I disagree with my Facebook friends, I feel uneasy telling them so on Facebook.

When I disagree with my Facebook friends, I would rather go along with them than argue with them on Facebook.

Social media use
How frequently do you use social media (e.g. Facebook and Twitter)?

(1) Once a month or less

(2) Several times a month

(3) Once a week

(4) Several times a week

(5) Once a day

(6) Several times a day

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