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Master Thesis Project

The impact of high-arousal emotions on motivation of German social media users to participate in online firestorms: an extension of problem-solving and collective predictors of online firestorm participation.

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Abstract

Purpose - Social media empower individuals to express their discontent about matters that they perceive as intolerable. The expression of such discontent can quickly intensify, spread across social media platforms and spill over to mainstream media. The result is a virtual public outrage, known as an online firestorm. While current research on the role of participants' intentions in the emergence and spread of online firestorms is scarce, this study attempts to contribute to filling this gap in the literature by extending the theoretical model on online firestorm participation (Gruber et al., 2019) with high-arousal emotional predictors, namely the need to take revenge, the need to vent negative emotions and the moral obligation to warn others.

Methodology – A quantitative online survey was distributed non-randomly via snowball sampling confronting respondents with a real online firestorm stimulant. Based on the survey data of 222 German participants using social media sites at least occasionally, a hierarchical regression analysis was conducted to determine the drivers of participatory intentions towards online firestorms and assess the extent to which high-arousal emotions change the variation in the dependent variable, 'motivation to participate in online firestorms'.

Findings – The sense of belonging to a community, the moral obligation to warn others of a perceived misconduct and the need to vent negative emotions positively predicted motivation to engage in online firestorms while a non-anonymous online environment constrained it. High-arousal emotional predictors were found to increase variation in German social media users' motivation to participate in online firestorms by approximately 10%.

Originality/value – The study's findings add to the understanding of emergence and spread of online firestorms on social media while its insights help to further develop theory and forms of professional crisis prevention and mobilization of group members.

Keywords online firestorm, social media, motivation, situational theory of problem solving, participation behaviour, eWOM, online protest, emotions

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1. Introduction

Nowadays, organizations make increasingly use of social media channels in order to promote their corporate brand and their products and services (Hewett et al., 2016). While social network sites (SNSs) enable organizations to reach their target audience in a direct and fast way, these platforms can easily give room for negative online word-of-mouth (WOM) that might backfire at the organization within hours (Pfeffer et al., 2013).

In case of a questionable statement or a seemingly moral misconduct, not only companies and their brands but also politicians, governmental institutions and celebrities have increasingly become subject to instant waves of criticism involving intense indignation with the intention to be offensive (Johnen et al., 2017). In a more extreme step, all attention is withdrawn from the accused as the latter is completely ostracised from public platforms and any form of online interaction with his network (Norris, 2021). This way of censuring the subject for intolerable statements and/or (in)action mostly related to social injustice, for instance racism, sexism, homophobia and bullying (Ng, 2020), is practiced under the term 'cancel culture' (e.g., Clark, 2020; Ng, 2020; Norris, 2021; Romano, 2019). Both, an online firestorm and being 'cancelled' can cause severe negative effects for the organization, group or person under attack. A loss of viewership, social media followers and purchases of products endorsed by the accused are common immediate consequences (Ng, 2020) followed by damaged reputations and careers, psychological stress and financial losses (Hewett et al., 2016).
In order to protect their brand and reputation, it is in the interest of organizations as well as other entities engaged in public communication to understand how online firestorms emerge and evolve, and consequently, why social media users participate in such a virtual attack in the first place.

To define online firestorms, this research draws on the attempt of Rost et al. (2016) terming an online firestorm a form of "crowd-based outrage" (p.2) expressed through the posting and sharing of extensive critique, aggressive swearwords and insulting comments in social media networks directed against a person, organization or group. In most cases, the hostile postings multiply and spread like wildfire (Hauser et al., 2017; Hewett et al., 2016; Johnen et al., 2017; Pfeffer et al., 2013; Rost et al., 2016).

While researchers have looked into how an online firestorm develops on SNSs (Jackson and Welles, 2015), which structural elements encourage the development of firestorms (Pfeffer et al., 2013), how traditional media report on them (Einwiller et al., 2016) and how organizations can best cope with online firestorms on social media (Hauser et al. 2017; Hewett et al., 2016) little research has paid attention to social media users' intentions to participate in online firestorms.

An experiment carried out by Johnen et al. (2017) has found that people contributed to online firestorms when driven by the desire for social recognition and an individual moral compass. This compass is grounded in deep, genuine attitudes and sentiments that give people moral guidance. Upon perceived violation of their moral values the affected find themselves and society endangered (Eisenberg, 2000; Lindenmeier et al., 2012; Rost et al., 2016). This stimulates the need to engage in an online firestorm with the purpose to warn others of perceived violation and potential threat for society at large (Johnen et al., 2017). Furthermore, the researchers focused on the impact of commonalities between a single social media user and the firestorm collective on user motivation to join the collective by adding to the online firestorm. Exemplary for these similarity-based factors are the degree to which a social media user identifies with the participants of the online firestorm (perceived similarity of participants) and the extent to which the firestormer's opinion is mirrored by the perceived public opinion (perceived coherence with public opinion) (Johnen et al., 2017).

Gruber et al. (2019) investigated participatory intentions of users involved in online firestorms from a different point of view by extending the Situational Theory of Problem Solving (STOPS) (Kim and Grunig, 2011) with the independent variables slacktivism, collective identity and collective efficacy. They thus paid attention to the roles collective factors play in social media user's motivation to participate in online firestorms. Their findings show that the perception of forming a collective identity through the agreement on a personally relevant topic was the strongest driver of participation in an online firestorm whereas the perception of being efficacious as such a collective actor did not impact participatory intentions regarding a firestorm (Gruber et al., 2019).

Despite the aforementioned insightful results, the impact of emotional determinants on participatory intentions has not been considered yet in combination with factors derived from the STOPS, hereinafter referred to as problem-solving predictors, and collective factors such

as collective identity and community efficacy, potentially driving online firestorm engagement. In other words, the inclusion of emotional predictors into the proposed theoretical model of online firestorm participation by Gruber et al. (2019) is worth to be examined since previous studies have produced evidence that emotions drive communicative action online (e.g., Berger, 2014; Berger & Milkman, 2012; Diakopoulos & Naaman, 2011; Heath et al., 2001; Heiss, 2020; Hennig-Thurau et al., 2004; Johnen et al., 2017; Lee & Kim, 2020; Svari & Erling Olsen, 2012; Yap et al., 2013).

Particularly, it has been shown that the tendency of dissatisfied customers to complain through negative electronic WOM (eWOM) on social media platforms is amplified by high levels of emotions (Svari & Erling Olsen, 2012). Moreover, the spreading of (negative) eWOM is a contagious process during which social media users are pushed towards firestorm participation through social transmission of high-arousal emotions (Berger, 2014). The reception and processing of emotional social media content subjects the receiver to a process of absorbing emotions posted by other social media users (Berger, 2014). As a result, experienced emotions by other firestorm participants conveyed into their social media posts trigger additional posts with similar tonality and increase the overall volume and virality of online firestorms (Berger & Milkman, 2012; Heath et al., 2001).

In an extension of Gruber et al.'s (2019) work, this study considers emotional factors, for instance the need to take revenge, the moral obligation to warn others and the venting of negative emotions, as significant drivers for motivation to participate in online firestorms. These three emotional factors have been deliberately chosen since they deal with high-arousal emotions (i.e., anger and anxiety), sometimes also termed action-relevant emotions (e.g., Thomas et al., 2015). As the name suggests, these emotions have been shown to trigger sharing of and commenting on social media content to a greater extent than low-arousal emotions such as sadness (Berger & Milkman, 2012). High-arousal emotions therefore seem to represent meaningful drivers for motivation to participate in online firestorms.

In order to answer the overarching research question what factors influence the motivation of German social media users to engage in online firestorms, this study employs the theoretical model of online firestorm participation by Gruber et al. (2019). Following the previously mentioned importance of emotions towards intentions to participate in online firestorms, three high-arousal emotional variables, namely the need to take revenge, the moral obligation to

warn others and the need to vent negative emotions, were selected to extend the research model of Gruber et al. (2019). Thus, the study at hand poses two open research questions:

RQ1: What factors influence the motivation of German social media users to participate in online firestorms?

RQ2: To what extent do high-arousal emotional predictors, including the moral obligation to warn others, the need to take revenge and the need to vent negative emotions, account for the motivation of German social media users to participate in online firestorms?

The insights of this research are of relevance for professionals in corporate crisis prevention who seek to understand the emergence and spread of public online outrage. By looking into the origin of social media users' high-arousal emotions, this study enables organizations to anticipate heated and growing debates on societal issues and to react pre-emptively to the needs of their online community in a timely manner. In this way, professionals in corporate crisis prevention will be able to effectively reduce participation in online firestorms and consequently contain their virality. In the long run, such capabilities diminish the detrimental effects of an online firestorm yielding the protection and preserving of corporate reputation. Entities interested in drivers for collective action in a broader sense, for instance interest groups and activists, benefit from insights regarding effective mobilization of group members.

From an academic perspective, this paper adds to the understanding of the effects of problem-solving and collective factors on motivation to participate in online firestorms with a specific focus on how high-arousal emotions and motivation to express online complaints are related. The insights of this relationship help to further develop theory and forms of professional crisis prevention and mobilization of group members. Moreover, additional knowledge on problem-solving and collective drivers stimulating thoughtful and factual or impulsive and aggressive commenting on social media provides an important starting point to improve the quality of online discussions and theories related to the latter.

In the attempt to answer the above-proposed research questions, the remainder of this study is organized as follows. The theoretical framework presents the theoretical model of firestorm participation by Gruber et al. (2019) and conceptualizes the dependent variable 'motivation to participate in online firestorms', the problem-solving and collective predictors adopted from

Gruber et al. (2019), as well as the three high-arousal emotional determinants extending the model. In the subsequent methodology, the research design and procedure, respondents and measures are described, followed by a demonstration of the constructs' reliability and validity. In the presentation of the findings, significant predictors of motivation to participate in online firestorms are determined, and the extent to which high-arousal emotions explain motivation to participate in online firestorms is assessed by means of a hierarchical regression analysis. Closing with the discussion of the findings, limitations, implications and recommendations for future research, the study at hand ends with a brief conclusion of the research.

2. Theoretical Framework

In the past few years online firestorms have become a frequent phenomenon in social media. To shed light on the dynamics of this anger-driven turmoil it is essential to distinguish online firestorms from related opinion-based forms of public online communication such as user comments on online news, electronic WOM, flaming and more recently cancelling (Clark, 2020; Hennig-Thurau et al., 2004; Ng, 2020; Norris, 2021; O'Sullivan & Flanagin, 2003; Romano, 2019; Ziegele & Quiring, 2013).

What delineates online firestorms from these related forms is a very specific topic communication centres around, for instance perceived moral misconduct (Einwiller et al., 2016; Johnen et al., 2017). Further, voiced opinions are characterized by a high level of hostility and aggressiveness which distorts and misrepresents the actual issue to a greater extent than other forms of online communication (Johnen et al., 2017). Adding to that, Pfeffer et al. (2013) observed that while in an early stage the voiced outrage is still based on actual criticism, posted hostilities are almost free from content or arguments in later stages. Moreover, in online firestorms one can witness a higher degree of consensus and consequently less diversity among the expressed opinions than in related opinion-based forms of public online communication (Johnen et al., 2017). Ultimately, inherent to online firestorms is their volatility. Rapid accumulation of user comments as well as the sudden decline of the latter are distinct attributes for the online outcry (Johnen et al., 2017).

The emergence of online firestorms can be rooted in various external stimulants. Within the German (social) media landscape, perceived moral misconduct is the most frequent source of online firestorms to occur, followed by market misconduct (e.g., faulty product, bad service, unreasonable price) and perceived violation of honour or reputation (e.g., perceived unjust assault of a person or organization) (Einwiller et al., 2016). Depending on the trigger, goals pursued with firestorm engagement can differ from corrections of perceived injustices, expression of dissatisfaction about negative consumer experiences, denouncement of organizations and other public entities for their perceived (moral) misconduct, amusement when entertaining others at the cost of the victim and defending the honour and reputation of the attacked through firestorm participation after a perceived unjust assault (Einwiller et al., 2016).

In any case, the effects of online firestorms are detrimental. Often, the person, company or group under attack suffers from online bullying resulting in potential psychological stress,

severe reputation damages and might even experience financial losses (Hewett et al., 2016). In light of these repercussions, it is not surprising that online firestorms hold a widely negative connotation among society (Einwiller et al., 2016).

To provide a simple and all-encompassing definition of what online firestorms are, this study draws on the suggestion of Pfeffer et al. (2013) who define online firestorms as "the sudden discharge of large quantities of messages containing negative WOM and complaint behaviour against a person, company, or group in social media networks" (p. 118).

Motivation to participate in online firestorms

To define the multidimensional construct of motivation this research adopts the attempt of Baron (2003) who links motivation to internal human processes that serve to activate, direct, and sustain human behaviour. Further, researchers have identified three aspects that are considered to be central to human motivation. In a first step, the mindset of a human being is activated by *stimulants* like wants or desires which, in a second step, induce an *arousal* that ultimately leads to an activity with a certain *goal* in mind (Reeve, 2008). With Gruber et al.'s, (2019) model of online firestorm participation as a theoretical foundation, this study further explores which factors represent the aforementioned mental arousal triggering people's motivation to participate in online firestorms to achieve a certain goal.

Theoretical model of online firestorm participation by Gruber et al. (2019)

The theoretical model of online firestorm participation by Gruber et al. (2019) builds on the assumption that any form of communicative action is preceded by people's motivation to solve a problem (Kim and Grunig, 2011). In the context of online firestorms, such a communicative action becomes visible through the liking, sharing or posting of content on social media and is, according to the Situational theory of problem solving (STOPS) (Kim and Grunig, 2011), motivated by a person's problem recognition and involvement recognition while such motivation can be hampered by constraint recognition.

In their model, Gruber et al. (2019) adapted the drivers of the STOPS to the domain of online communication. Although these drivers have a significant influence on people's motivation to exercise a communicative act, they do not sufficiently explain participation in online firestorms since they neglect to take the characteristics of SNSs into account, which might facilitate firestorm participation (Gruber et al., 2019). Therefore, Gruber et al. (2019)

extended the STOPS by adding three factors that are characteristic of a social media environment and considering the collective nature of online firestorms that is slacktivism, collective identity and community efficacy.

While covering the collective nature of online firestorms, Gruber et al.'s (2019) model lacks to look into reasons for participation induced by emotional determinants. However, it is precisely emotional factors that cause the aggressive tone and rapid circulation of contentious topics eventually progressing into an online firestorm (Berger, 2014).

The study at hand, therefore, proposes to extend the theoretical model of online firestorm participation (Gruber et al., 2019) with three emotional factors as the latter signify internal human processes that account for the activation and guidance of human behaviour (Baron, 2003), which, in this research, represents the motivation to participate in online firestorms. Consequently, the emotional determinants, the need to take revenge, the moral obligation to warn others and the need to vent negative emotions, were added to Gruber et al.'s (2019) model with the aim of doing justice to the construct 'motivation to participate in online firestorms' by fulfilling the necessity to include emotional predictors.

The three emotional variables, the need to take revenge, the moral obligation to warn others and the need to vent negative emotions, were specifically selected since they deal with high-arousal emotions, equally termed action-relevant emotions (Thomas et al., 2015). Other than low-arousal emotions, high-arousal emotions encourage people to share and comment upon social media content fuelling a collective dynamic destined to turn into an online firestorm (Berger and Milkman, 2013).

Factors influencing motivation to participate in online firestorms

Problem recognition

Identifying a problem is a condition for an individual's motivation to solve this problem and consequently to participate in a communicative action in this regard. Kim and Grunig (2011) have made a distinction between perceptual problems and cognitive ones. While they define a perceptual problem as a "perceptual discrepancy between expected and experienced states" they identify a cognitive problem as "the absence of a readymade solution to a perceptual problem" (p. 128). Similarly, Johnen et al. (2017) discovered that if an individual faces a perceptual discrepancy between expected and experienced states – that is, the individual's sense of morality is violated – then this individual is motivated to participate in the online protest.

Smith et al. (1998) even argue that the severity of the recognized problem strengthens the motivation to engage in negative WOM. They have found that customers who encountered a service failure were confronted with the feeling of potential harm or loss as soon as they perceived this service failure to be severe. As a consequence, these customers tried to mitigate their negative feelings by pursuing revengeful motivations and explicitly expressing their negative emotions regarding the incident (Zourrig et al., 2009). Thus, it can be argued that the severity of a perceived corporate offense strengthens the motivation to express negative WOM. Hence, the following hypothesis is suggested:
H1: *Problem recognition positively relates to motivation to participate in online firestorms.*

Constraint recognition
According to Kim & Grunig (2011) constraint recognition occurs as soon as an individual faces a perceived impediment in a certain situation that limits the individual's ability to do anything about that situation. In the context of online firestorms, non-anonymity represents an impediment hindering communicative actions and thus the participation in online firestorms (Gruber et al., 2019). Previous research has shown that social media users were more willing to express their opinion in an anonymous online environment than in a non-anonymous one due to risks of social sanctions that might arise from unpopular opinions when users speak out under their real name (Porten-Chée & Eilders, 2015). Furthermore, people who can express themselves anonymously do not face expectations or constraints imposed by their social environment and can thus act freely without fearing disapproval from their social group (Bargh et al., 2002). The hypothesis thus reads:
H2a: *Non-anonymity in social media platforms negatively relates to motivation to participate in online firestorms.*

A second factor that may hinder an individual's willingness to express their (negative) opinion online is the lack of familiarity with other members in the social media environment. Put another way, people are more willing to participate in an online discussion when the people already involved in this discussion are familiar to them (e.g., friends and family) instead of being strangers (Crandall & Ayres, 2002; Moy et al., 2001). An explanation for this was given by researchers who looked into the applicability of the spiral of silence theory (SOS) in the realm of online communication (Askay, 2014; McLeod, 2008; Slater, 2007). They discovered that people who found their opinion supported by members of their peer

group were more inclined to participate in the online discussion than people whose social circle was not part of the social network in which the discussion took place.
This phenomenon derives from theories of conformity (Noelle-Neumann, 1993) that account for the fear of isolation members of a peer group face when seeing their friends and family engage in online discussions (Askay, 2014). Such advocacy behaviour pressures social media users to conform with the posted opinion of their peers in order to avoid social exclusion (Asch, 1956; Cialdini & Trost, 1998; Moy et al., 2001).
Conversely, such fear of isolation is absent as soon as friends and family do not appear in the online issue arena. Consequently, social media users' willingness to express non-positive views in the sole presence of strangers is reduced as users are not exposed to the social pressure to publicly conform with posted comments of affiliates (Askay, 2014; Moy et al., 2001).
In their model, Gruber et al. (2019) refer to this phenomenon as member unfamiliarity arguing that SNSs (e.g., Facebook) produce an environment that lives from a user's numerous superficial connections to unfamiliar people since genuine interaction with the person behind the social media account does not take place (Tong et al., 2008). Thus, the following hypothesis is proposed:
H2b: *Member unfamiliarity negatively relates to motivation to participate in online firestorms.*

Involvement recognition
Kim & Grunig (2011) define involvement recognition as "a perceived connection between the self and the problem situation" (p. 130). They further explain that the degree to which an individual is actively involved in a communicative action depends on the extent to which this individual perceives to be connected to the problematic situation (Kim & Grunig, 2011). Therefore, the more affiliated an individual feels to a certain problem, the more likely it is that this individual will show active communication behaviour in order to solve this problem (Heath and Douglas, 1990). The positive relationship between perceived issue involvement and speaking out on social media was also confirmed in the context of online bullying. Individuals who viewed gay bullying as a salient social issue were more likely to post comments on Facebook to fight the discriminant behaviour than people who did not consider gay rights important (Gearhart & Zhang, 2013).
Additionally, motivation to participate in online firestorms is facilitated through the willingness to show advocacy behaviour, which Choi et al. (2011) found to be a prominent

result of perceived involvement in a situation. As soon as an individual perceives to be connected to a certain situation or problem, this individual will engage in any communicative behaviour that helps to spread the word to improve the situation or solve the problem (Choi et al., 2011). The hypothesis thus reads:

H3: *Involvement recognition positively relates to motivation to participate in online firestorms.*

Slacktivism

The term slacktivism describes a form of advocacy behaviour on social media which can be exerted without great effort by the advocate (Rotman et al., 2011). This passive form of online activism takes place through either the liking of content on social media sites such as Facebook or Instagram in order to express support for an issue or through the sharing and forwarding of information on a specific topic (Lee and Hsieh, 2013). The degree of effort or commitment by employing these activities is relatively low compared to real-life demonstrations that require people to make an effort when supporting a certain cause, e.g., by roaming the streets with self-made signs (Porten-Chée and Eilders, 2014). However, the opportunity of effortless opinion expression, e.g., sharing of or commenting on a post, has been found to prompt peoples' willingness to express themselves whereas face-to-face settings rather hinder motivation to engage in discussions (Porten-Chée and Eilders, 2014). Consequently, Gruber et al. (2019) have identified slacktivism as a factor facilitating participation in online firestorms. The proposed hypothesis thus reads:

H4: *Slacktivism positively relates to motivation to participate in online firestorms.*

Collective Identity

The goal of sharing and commenting on information on social media does not necessarily have to be related to problem solving as proclaimed in Kim and Grunig's (2011) STOPS. Alternatively, the motivation to engage in online complaint behaviour may be rooted in the feeling of affiliation to a particular interest group (Kim et al., 2010). Such sense of belonging is amplified on social media platforms since the latter help to build an alternative public environment that signals social media users to belong to an online community advocating for the same cause (Harlow and Harp, 2012). This form of opinion-based group identity (Thomas et al., 2015) occurs through intra-group interactions publicly voicing group-internal consensus (Postmes et al., 2005) that often stems from recognition of shared beliefs amongst people (Swaab et al., 2007).

The formation of collective identity has shown to soften egocentric characteristics of group members and to elicit a sense of community (Milan, 2015) that arouses commitment to the cause among members of the collective (Gruber et al., 2019). The experimental study of Thomas et al. (2015) has proven a similar psychological link showing that subjective feelings of belonging to an opinion-based group prompted intentions for collective action. In the context of this research, the aforementioned intentions of collective action can well reflect the motivation to participate in online firestorms. Hence, the following hypothesis is suggested:
H5: *Collective identity positively relates to motivation to participate in online firestorms.*

Community Efficacy

Perceived community efficacy is closely connected to perceived collective identity since the latter has been shown to be directly affected by group efficacy and resulting in collective action (Thomas et al., 2009; Thomas et al., 2015). When people feel collectively powerful and perceive themselves to be effective in a group a sense of belonging is caused that elicits collective participatory intentions (Thomas et al., 2009; Thomas et al., 2015). Concurrently, when people feel part of a collective, they perceive themselves to be more effective in achieving their goals due to a feeling of empowerment resulting from the experienced sense of community (Gruber et al., 2019; van Zomeren et al., 2008). In line with that, Willemsen et al. (2013) have identified such feeling of empowerment emerging from a sense of community as one factor driving people to complain through negative eWOM.

Further, the *social identity model of collective action* (SIMCA; van Zomeren et al., 2008) posits that as soon as people believe their co-ordinated group efforts lead to fruitful outcomes, the same people are more likely to engage in efforts at group level to effect social change or fight a current state of affairs. Applied to the context of online firestorms, one might suggest that the aforementioned perceived group efficacy results in stronger motivation to counteract a perceived (corporate) wrongdoing, which is expressed through participation in an online firestorm. Therefore, the following hypothesis is proposed:
H6*: Community efficacy positively relates to motivation to participate in online firestorms.*

Need to vent negative emotions

Previous studies have found that emotions of a more internal kind like fear, shame and guilt, caused by a negative service incident, can result in complaint behaviours that do not address the associated company directly but voice themselves in an indirect way via social media

platforms (Hennig-Thurau et al., 2004; Sundaram et al., 1998; Svari & Erling Olsen, 2012). The decision to express complaint publicly on social media instead privately to the company is taken as soon as the consumer finds himself partially or wholly responsible for the negative service incident (Svari & Erling Olsen, 2012). Such situations were researched by Robertson & Shaw (2009) who observed people being unsuccessful when using self-service technologies, for instance machine-assisted services, and subsequently attributed the failure to insufficient technological capabilities inherent in their person.

To process negative emotions that arise from blaming oneself, the affected decided to post harmful comments online as a form of indirect complaint (Robertson & Shaw, 2009). Such behaviour acts as a valve and helps to release the negative internal emotions (Svari & Erling Olsen, 2012). Once people perceive intense negative emotions, feelings of dissonance arise that the affected wish to reduce (Diakopoulos & Naaman, 2011). The latter is an important driver of participation in online complaint behaviour and has been found to lessen frustration and anxiety (Sundaram et al., 1998) or simply helps "venting negative feelings" as Hennig-Thurau et al. (2004) call it. In accordance with these findings, the following hypothesis is suggested:

H7: *The need to vent negative emotions positively relates to motivation to participate in online firestorms.*

Need to take revenge

Taking revenge can be described as an act of retaliating against a company with which an individual associates a negative experience (Sundaram et al., 1998). Other researchers even speak of revenge as "customers' need to punish and cause harm to firms for the damages they have caused" (Gregoire et al., 2009, p. 19). As a result, the exertion of such punishment often takes place by voicing negative eWOM or by participating in online firestorms (Gregoire et al., 2009; Sundaram et al., 1998; Whiting et al., 2019).

This need to take revenge can be explained by the notion of balance theory which proclaims that individuals seek to restore mental balance once their state of mind has become unbalanced (Zajonc, 1960). In the context of consumer experiences, an unbalanced state can derive from either a strong positive or a strong negative consumer experience (Hennig-Thurau et al., 2004). An unsatisfactory consumer experience evokes a psychological tension inside the consumer – an unbalanced mind – due to a strong desire to reduce the experienced discontent (Sundaram et al., 1998).

To restore an emotional balance to their situation and to compensate for the perceived injustice, people seek to share their dissatisfying experience through the engagement in online firestorms (Whiting et al., 2019). In this way, the consumer does not only lessen frustration but also manages to fulfil the need to make the company pay (Whiting et al., 2019).

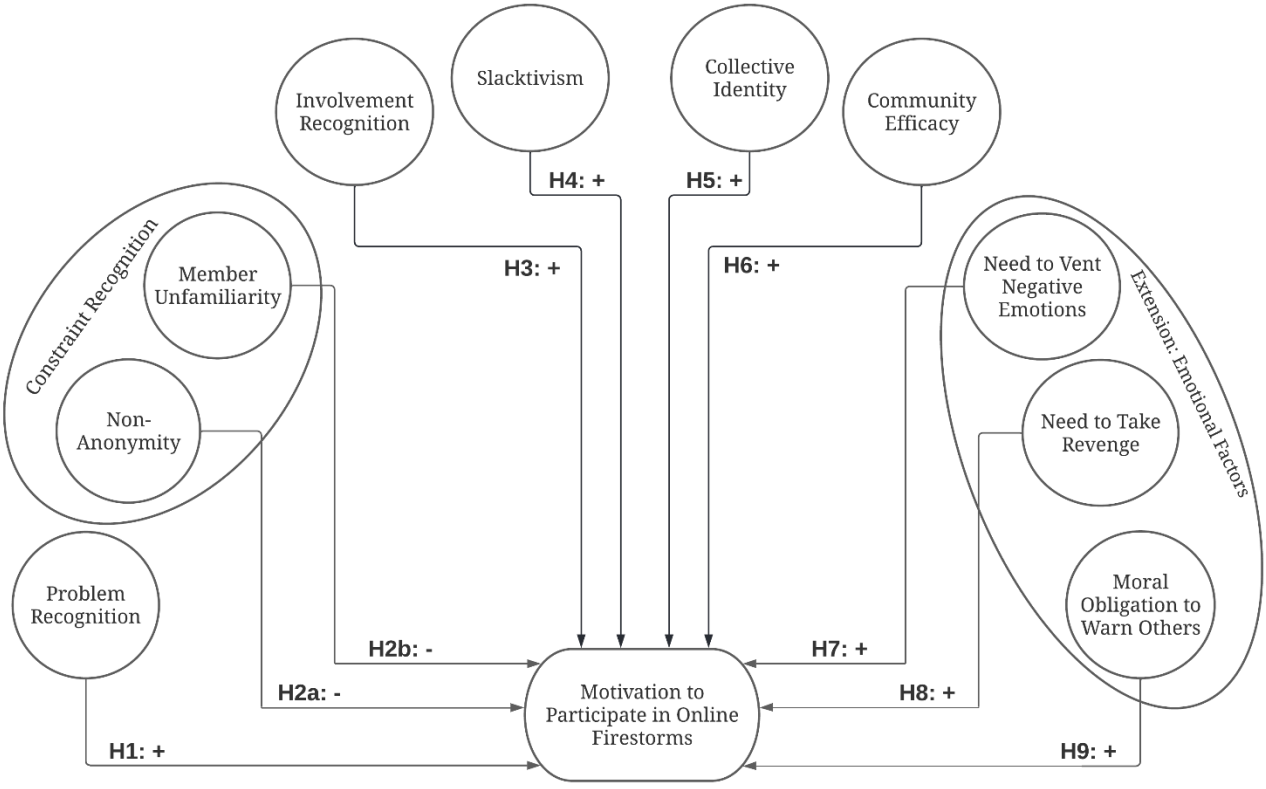
Taking part in online firestorms driven by the desire of taking revenge has been witnessed to happen relatively often compared to other drivers for participation. Already in 1998, Sundaram et al. found that 36 percent of consumers who engaged in negative eWOM were driven by the motive to harm a certain company. This motive was expressed through numerous active attempts of consumers to prevent other people from supporting the company with which they associated a dissatisfying experience. The hypothesis thus reads:
H8: *The need to take revenge positively relates to motivation to participate in online firestorms.*

Moral obligation to warn others / altruism
Another emotional factor driving online firestorm participation is the desire to warn others, which is considered an attribute of altruism (Yap et al., 2013). An altruistic motive describes an individual's natural longing to assist other people in making correct decisions without expecting any kind of compensation in return (e.g., Sundaram et al., 1998; Yap et al., 2013).

In the context of perceived market misconduct (Einwiller et al., 2016) negative consumer experiences incite those affected to make other consumers aware of the issues encountered with the company's products or services by sharing negative experiences online to protect the public from falling into the same trap (Hennig-Thurau et al., 2004; Lee & Kim, 2020; Yoo & Gretzel, 2008).
In the event of perceived moral misconduct (Einwiller et al., 2016) online protesters recognise "some existing social condition or aspect of life and define it as unjust, intolerable, and deserving of corrective action" (Snow & Benford, 1992, p. 137). Such arousal stems from the violation of social, political or religious moral standards by people or institutions in power and strongly stimulates motivation to participate in online firestorms (Einwiller et al., 2016; Eisenberg, 2000; Lindenmeier et al., 2012). Hence, the following hypothesis is suggested:
H9: *Moral obligation to warn others positively relates to motivation to participate in online firestorms.*

Figure 1

Conceptual Research Model on Motivation to Participate in Online Firestorms



3. Method

3.1 Design and Procedure

This study gathered data through a survey method to measure the variables included in the research model as proposed in Figure 1. A survey was selected as the preferred methodology for the study at hand as it allowed to be administered online via mobile devices and therefore prevented geographical dependence of the researcher who resided in a different country than the research population.

The survey was conducted through the online tool Qualtrics and digitally distributed using a non-random sampling approach, i.e., snowball sampling, by reaching out to possible respondents through the social media platforms LinkedIn, Facebook and Instagram. In addition, respondents were encouraged to share the questionnaire within their social circle. It was decided to make use of snowball sampling to collect data cost-effectively and in a short period of time, at the expense of less quality findings as an unbiased representation of the research population could not be guaranteed.

The survey started with an active informed consent and general questions providing demographic information of the sample. Thereafter, an audio-visual firestorm stimulant was presented preparing respondents to rate the subsequent questionnaire items. Thereafter, a three-minute video introduced respondents to the concept of online firestorms and showed an exemplary online firestorm the German car manufacturer BMW had to face not too long ago. The portrayed firestorm dealt with the topic of climate change as the latter was previously denigrated by BMW in one of their car advertisements which caused the digital public outrage. Understandably, the inappropriate car advertisement captioned *If this summer wasn't warm enough already, the Mercedes-AMG GLA 45 4MATIC will heat things up even more with this red-hot finish* met with little approval but sparked anger instead.

The complete survey questionnaire including a link to the firestorm stimulant is displayed in Appendix A.

The scenario was chosen as the research stimulus since previous studies had found environmental issues to resonate with a significant number of online users (Barr, 2010; Boulianne & Ohme, 2021; Corner et al., 2014) consequently eliciting a form of mental arousal helping the respondents to better identify with the questionnaire's statements that suggest various reasons why one would participate in an online firestorm.

Overall, the data collection was completed after a duration of four weeks, starting on December 2 and ending on December 30, 2021.

3.2 Respondents

It was decided to only include German participants in the study to prevent cultural differences that might influence the online participation behaviour of the respondents. Since the social environment of the researcher consisted predominantly of Germans, respondents of this nationality were selected in order to reach a representative number of participants for the research population by means of snowball sampling. In addition, only respondents who were in possession of a social media account were able to participate in the survey as the latter was exclusively distributed on social media platforms. After all, this requirement assured a minimum familiarity with social media sites on the part of the participants which again ensured their comprehension of statements referring to the navigation of social media sites. Further, solely people between 18 and 35 years of age were eligible to fill in the questionnaire as these age groups are often termed generation Y and Z, two cohorts of which the majority is commonly considered to be very internet-savvy (Bencsik et al., 2016; Chillakuri, 2020; Chillakuri & Mahanandia, 2018; Venter, 2017).

Upon termination of the data collection, 296 individuals filled in the questionnaire of which 74 had to be excluded from the data analysis as they did not complete the survey. The final research sample for analysis consequently consisted of 222 respondents.
While a detailed overview of the sample characteristics is presented in Table 1, it is interesting to note that the vast majority of participants (95%) considered environmental topics, including climate change, serious issues but did not participate in an online firestorm yet (82%). Furthermore, almost all respondents were well-educated with two thirds holding an academic degree while the remaining participants, with a few exceptions, were qualified for general university entrance. Due to their young age, though, a significant amount of the respondents was still in the process of their academic career, not having reached their highest educational qualification yet. The respondents' average age of 26.7 years (SD=3.46) was found to be exactly between generation Y and Z.

Table 1

Sample Characteristics

Demographics		n	%
Gender			
	Male	84	37.8
	Female	136	61.2
	Not identified as male or female	1	0.5
	Prefers not to answer	1	0.5
Age			
	18 thru 26 (Generation Z)	94	42.3
	27 thru 35 (Generation Y)	128	57.7
Education			
	Degree without university entrance qualification	4	1.8
	General university entrance qualification	62	27.9
	Bachelor degree	81	36.5
	Master degree	72	32.4
	PhD degree	3	1.4
Place of Residence			
	Germany	190	85.6
	Other	32	14.4
Residence within Germany			
	Baden-Württemberg	19	8.6
	Bavaria	6	2.7
	Berlin	15	6.8
	Bremen	2	0.9
	Hamburg	7	3.2
	Hesse	5	2.3
	Lower Saxony	6	2.7
	North Rhine-Westphalia	119	53.6
	Rhineland Palatinate	6	2.7
	Saarland	1	0.5
	Saxony	1	0.5
	Saxony-Anhalt	2	0.9
	Schleswig-Holstein	1	0.5
Prior firestorm participation			
	Yes	8	3.6

	No	182	82
	Not sure	32	14.4
Considers climate change a serious issue			
	(Rather) yes	211	95
	(Rather) no	11	5
Total number of respondents		222	100

3.3 Measures

In order to measure the independent variables, each of them was operationalized into a measurable construct. For each construct, 3-4 statements were adapted from previous studies treating the same variables on the topic of online firestorm participation. Subsequently, the respondents could rate each statement on a 7-point-Likert scale, ranging from 1 – completely disagree to 7 – completely agree. A 7-point-Likert scale is useful when one wants to measure attitudes on an ordinal scale (Likert, 1932) and provides more sensitive answers than a 5-point-Likert scale as respondents tend to opt less often for the neutral answer "neither agree nor disagree" (Matell & Jacoby, 1971).

Before the survey was published, all statements were pre-tested with ten people between the ages of 18 and 35, half of whom were male and half female. Statements that were misunderstood, were adjusted accordingly.

Several statements containing the word "problem" or "issue" were found to be unclear as the majority of respondents during the pre-test was unsure whether the "problem" or "issue" referred to the topic of the firestorm in general (climate change) or to the problem the advertisement eliciting the firestorm caused in particular (denigration of climate change). The pre-test thus emphasized the importance of clearly distinguishing between the general problem the firestorm was about, namely climate change, and the issue the advertisement eliciting the firestorm caused in particular, that is the denigration of climate change. Consequently, numerous statements were clarified by adding additional information in brackets. Among others, the statement "I believe this issue is a real problem" was adjusted to "I believe this issue (climate change) is a real problem". Similarly, the statement "Posting negative comments on social media would help in resolving this issue" was changed to "Posting negative comments on social media would help in resolving this issue (denigration of climate change)."

Furthermore, an informative sentence was added to the heading above each block of statements notifying the respondents that the displayed statements are related to the firestorm scenario presented in the introductory video.

In total, the final questionnaire contained 11 constructs with 3-4 statements for each construct, counting 34 statements overall. The measured constructs were ‘motivation to participate in online firestorms’, ‘problem recognition’, constraint recognition comprising the constructs ‘member unfamiliarity’ and ‘non-anonymity’, ‘involvement recognition’, ‘slacktivism’, ‘community efficacy’, ‘collective identity’, ‘the need to vent negative emotions’, ‘the need to take revenge’ and ‘moral obligation to warn others’. An overview of the constructs used in this study and their measures can be found in the table in Appendix B. The construction of the items for each construct is explained in more detail below.

Motivation to participate in online firestorms

'Motivation to participate in online firestorms' was the dependent variable in this research. It was conceptualized as the willingness of social media users to express their opinion on a certain topic by commenting on posted content on social media regarding this topic. The construct was operationalized by adapting its items (e.g., "I am willing to express my opinion on this issue by commenting upon the posted content"; "I am driven to express my agreement on this issue by commenting upon the posted content") from the study of Gruber et al. (2019). In total, three statements were formulated for motivation to participate in online firestorms.

Problem recognition

The construct 'problem recognition' was operationalized with three items (e.g., "I believe this issue is a real problem"; "I believe this issue has serious societal consequences") inspired by the study of Gruber et al. (2019) and modified to fit this study's needs. In total, three statements were formulated to measure problem recognition.

Constraint recognition – member unfamiliarity

The construct 'member unfamiliarity' was measured with three items (e.g., "I am not comfortable discussing this issue on social media since I do not know most people involved in the discussion"; "I am not discussing this issue on social media since I am not acquainted with most people involved in the discussion") adapted from the study of Gruber et al. (2019).

Constraint recognition – non-anonymity

The construct 'non-anonymity' was operationalized with three items (e.g., "I am worried about the lack of anonymity when discussing this issue on social media"; "I am not comfortable expressing my opinion on the issue on social media as the platform is not anonymous") inspired by the study of Gruber et al. (2019) and modified to fit this study's needs.

Involvement recognition

The construct 'involvement recognition' was measured with four items (e.g., "I think this problem affects me personally"; "I am connected with this problem and its consequences") which were adapted from statements of the study of Gruber et al. (2019).

Slacktivism

The three items measuring the construct 'slacktivism' (e.g., "By liking, sharing or commenting on a post, I can help to address a social issue"; "Expressing agreement on social media by liking, sharing or commenting on a post is an appropriate way to display an advocacy behaviour") were also adjusted from the statements used by Gruber et al. (2019) to measure slacktivism.

Community efficacy

The construct 'community efficacy' was conceptualized as an individual's perceived capability to successfully resolve a social issue when operating within a group of people supporting the same cause. It was subsequently measured with three items (e.g., "The opinions and voices of the social media community about the problem can exert pressure on those responsible for the issue"; Taking part in the discussion would help the social media community in solving the issue") adjusted from the study of Gruber et al. (2019).

Collective identity

The construct 'collective identity' was conceptualized as an individual's sense of belonging to a group and subsequently measured with three items (e.g., "Participating in the discussion about this issue on social media makes me feel part of a community"; "I feel a sense of belonging whenever I join the discussion about the issue on social media") adapted from the study of Gruber et al. (2019).

Venting negative emotions

The construct 'venting negative emotions' was measured using three items (e.g., "Voicing my negative opinion on this issue helps to reduce my anger"; "Expressing my anger towards this issue makes me feel relieved") adapted from the study of Krishna & Kim (2020).

Need to take revenge

The construct ‘need to take revenge' was operationalized with three items (e.g., "Posting negative things is a way for me to punish those responsible for the issue"; "Saying negative things is my way of giving those responsible for the issue a hard time") taken from the study of Krishna & Kim (2020) and adjusted for this study's needs.

Moral obligation to warn others

The construct 'moral obligation to warn others' was measured using three items (e.g., "Informing others about the issue is the right thing to do"; "I think it is morally acceptable to inform others of the wrongdoing of those responsible for the issue") from the study of Krishna & Kim (2020) which were modified to fit this study's needs.

3.4 Construct Reliability and Validity

To assure the internal consistency of the measurement instruments, a reliability analysis was performed (Table 2). All constructs showed a Cronbach alpha close to or above 0.7 apart from the construct slacktivism with a coefficient of 0.532 not representing an acceptable level of self-consistency. Consequently, it was decided to exclude ‘slacktivism’ from further data analysis, not least because the construct validity was also insufficient as will become clear in the further course of the paper.

To assess if all constructs measure what they claim to measure, exploratory factor analysis was performed (Table 2), revealing that the 34 items of this research loaded on 9 factors instead of the 11 factors originally envisaged. The items of the constructs ‘problem recognition’ and ‘involvement recognition’ seemed to measure the same construct instead of two distinct constructs as intended. Still, it was decided against merging them into one construct since upon careful content examination the two sets of items were clearly measuring two different things. While ‘problem recognition’ measured the aptitude of a person to recognize a problem, ‘involvement recognition’ went a step further and indicated a person to be somehow connected with this problem.

Following this reasoning, it was decided to drop ‘problem recognition’ from further analysis and keep ‘involvement recognition’ as being involved with a problem stems from a person’s recognition of the problem as such. Thence, ‘involvement recognition’ presupposes a person’s problem recognition so that, in a way, the construct ‘problem recognition’ was already expressed in ‘involvement recognition’.

Further, exploratory factor analysis showed that the set of items designed to measure ‘slacktivism’ did not load on one factor but correlated with the constructs ‘community efficacy’ and ‘moral obligation to warn others. As a result of its insufficient construct validity and reliability, the variable ‘slacktivism’ was excluded from further data analysis.

Table 2

Exploratory Factor Analysis

Statements	Factor								
	1	2	3	4	5	6	7	8	9
PROB_REC_3 - Something needs to be done to prevent a similar issue (climate change) like this.	0.87								
PROB_REC_2 - I believe this issue (climate change) has serious societal consequences.	0.85								
INV_REC_1 - I think this problem (climate change) affects me personally.	0.82								
PROB_REC_1 - I believe this issue (climate change) is a real problem.	0.81								
INV_REC_3 - This problem (climate change) has certain consequences for me.	0.78								
INV_REC_4 - This problem (climate change) has certain consequences for people close to me.	0.77								
INV_REC_2 - I am connected with this problem (climate change) and its consequences.	0.77								
DV_2 - I am driven to express my agreement on this issue by commenting upon the posted content.		0.88							
DV_3 - There is a high probability that I will engage in this issue by commenting upon the posted content.		0.85							
DV_1 - I am willing to express my opinion on this issue by commenting upon the posted content.		0.84							
COM_EFF_1 - Posting negative comments on social media would help in resolving this issue (denigration of climate change).			0.78						
COM_EFF_3 - Taking part in the discussion would help the social media community in solving the issue (denigration of climate change).			0.77						
COM_EFF_2 - The opinions and voices of the social media community about the problem can exert pressure on those responsible for the issue.			0.65						
SLACK_1 - By liking, sharing or commenting on a post, I can help to address a social issue.			0.60						
SLACK_2 - Expressing agreement on social media by liking, sharing or commenting on a post is an appropriate way to display an advocacy behaviour.									
COL_ID_2 - I feel a sense of belonging whenever I join the discussion about the issue on social media.				0.90					
COL_ID_1 - Participating in the discussion about this issue on social media makes me feel part of a community.				0.87					
COL_ID_3 - I feel connection with others whenever I contribute to the discussion about the issue on social media.				0.82					
MBR_UN_2 - It is difficult to discuss this issue on social media since I do not know most people involved in the discussion.					0.93				
MBR_UN_1 - I am not comfortable discussing this issue on social media since I do not know most people involved in the discussion.					0.91				
MBR_UN_3 - I am not discussing this issue on social media since I am not acquainted with most people involved in the discussion.					0.89				
NON_A_2 - I am not comfortable expressing my opinion on the issue on social media as the platform is not anonymous.						0.88			
NON_A_3 - Joining the discussion about the issue on social media is difficult since I could not be anonymous.						0.87			
NON_A_1 - I am worried about the lack of anonymity when discussing about this issue on social media.						0.84			
RVG_2 - Saying negative things allows me to take revenge on those responsible for the issue.							0.84		
RVG_3 - Saying negative things is my way of giving those responsible for the issue a hard time.							0.83		
RVG_1 - Posting negative things is a way for me to punish those responsible for the issue.							0.71		
VNE_2 - Expressing my anger towards this issue makes me feel relieved.								0.81	
VNE_1 - Voicing my negative opinion on this issue helps to reduce my anger.								0.80	
VNE_3 - Posting negative comments on this issue helps me in venting my anger.								0.69	
MOTWO_3 - I think it is morally acceptable to inform others of the wrongdoing of those responsible for the issue.									0.67
MOTWO_2 - I feel the moral obligation to inform other people about the issue.									0.63
MOTWO_1 - Informing others about the issue is the right thing to do.									0.60
SLACK_3 - I would rather take a stand on a similar issue like this on social media than participate in a real-life demonstration.									
Cronbach alpha:	x	.94	x	.94	.92	.89	.88	.85	x
Explained variance in %:	22.66	15.84	10.91	5.80	5.09	4.52	3.64	3.34	3.21
Eigenvalue:	7.71	5.39	3.71	1.98	1.73	1.54	1.24	1.14	1.09

Thereafter, factor analysis was performed once again to see if nine factors could be retrieved upon exclusion of ‘problem recognition’ and ‘slacktivism’. The remaining nine constructs loaded on a factor of their own showing acceptable Eigenvalues (Kaiser, 1960) apart from the variable ‘moral obligation to warn others’ that had an Eigenvalue of .85. However, following Cattell (1966) and graphing the Eigenvalues against the factors with which they are associated, the scree plot showed the factor ‘moral obligation to warn others’ to hold substantial size compared to the other factors in the distribution as the graph’s break in magnitude clearly occurred before the factor ‘moral obligation to warn others’ (Cudeck, 2000; Field, 2017).

Since the study’s sample size exceeded 200 participants, the scree plot provides a fairly reliable criterion for factor selection (Stevens, 2002) resulting in the decision to consider ‘moral obligation to warn others’ a meaningful factor and retain the latter in spite of its Eigenvalue not meeting Kaiser’s criterion.

4. Results

4.1 Descriptive Statistics

In order to get a first insight into the respondents' attitude towards the constructs and their level of agreement with the latter, the mean scores of the variables were computed (Table 3). All variables were measured on a 7-point Likert scale with the lowest score of 1 (completely disagree) and the highest score of 7 (completely agree). For a complete overview of all mean scores and their SD, please refer to Table 3.

Table 3

Mean and Standard Deviation values of the research constructs

Constructs	n	Mean	SD
Measurement scales			
Motivation to participate in online firestorms	222	3.13	1.45
Non-anonymity	222	3.72	1.58
Member unfamiliarity	222	3.44	1.54
Involvement recognition	222	6.15	0.95
Community efficacy	222	3.65	1.22
Collective identity	222	3.18	1.40
Need to vent negative emotions	222	2.97	1.34
Need to take revenge	222	2.57	1.33
Moral obligation to warn others	222	5.15	1.06

All scales are measured on a 7-point Likert scale (1=completely disagree / 7=completely agree)

4.2 Correlation Analysis

To detect multicollinearity issues, Pearson's correlation coefficient was computed (Table 4). Apart from 'involvement recognition' all independent variables correlated significantly with 'motivation to participate in online firestorms'. Further, among the significant correlation coefficients no presence of multicollinearity could be detected. In addition, the variance inflation factors of the constructs did not indicate any multicollinearity issues either as they showed values well below 2 for all constructs.

The dependent variable shows a weak negative relationship with both ‘non-anonymity’, $r(220) = -.20$, $p < .01$, and ‘member unfamiliarity’, $r(220) = -.15$, $p = .029$.
Weak to moderate positive correlations were found between ‘motivation to participate in online firestorms’ and ‘community efficacy’, $r(220) = .32$, $p < .01$, ‘motivation to participate in online firestorms’ and ‘collective identity’, $r(220) = .45$, $p < .01$, ‘motivation to participate in online firestorms’ and ‘venting negative emotions’, $r(220) = .42$, $p < .01$, ‘motivation to participate in online firestorms’ and ‘taking revenge’, $r(220) = .30$, $p < .01$, ‘motivation to participate in online firestorms’ and ‘moral obligation to warn others’, $r(220) = .40$, $p < .01$.
For a complete overview of all Pearson correlation coefficients please refer to Table 4.

Table 4

Correlations

	1	2	3	4	5	6	7	8	9
Measures									
1 Non-anonymity	1								
2 Member unfamiliarity	,349**	1							
3 Involvement recognition	-0,100	0,118	1						
4 Community efficacy	-0,056	-0,042	,170*	1					
5 Collective identity	0,078	-0,070	0,046	,446**	1				
6 Need to vent negative emotions	0,062	-0,061	-0,013	,333**	,436**	1			
7 Need to take revenge	,169*	0,031	-0,017	,383**	,416**	,561**	1		
8 Moral obligation to warn others	-0,127	0,028	,490**	,369**	,286**	,208**	0,128	1	
9 Motivation to participate in online firestorms	-,198**	-,146*	0,062	,319**	,453**	,421**	,298**	,396**	1

***Correlation is significant at the 0.01 level (2-tailed).*

**Correlation is significant at the 0.05 level (2-tailed).*

4.3 Hierarchical Regression Analysis

A hierarchical regression analysis was conducted to determine whether the addition of high-arousal emotional predictors to the model would lead to substantial changes in the variance of ‘motivation to participate in online firestorms’, highlighting the importance of emotions when researching drivers for participatory behaviour in the domain of online communication. Moreover, regression analysis showed which predictor variables have a causal relationship with the response variable and the effect size with which the latter varies for each unit change in the predictor variable. The results are presented in Table 5.

The model predicting ‘motivation to participate in online firestorms’ from variables adopted from Gruber et al. (2019), for instance ‘non-anonymity’, ‘member unfamiliarity’, ‘involvement recognition’, ‘community efficacy’ and ‘collective identity’, accounted for a significant proportion of variance, $R^2 = .26$, $F(5, 216) = 16.22$, $p < .001$.

‘Non-anonymity’ negatively and significantly predicts ‘motivation to participate in online firestorms’, $ß = -.19$, $t(216) = -3.30$, $p = .001$, accounting for a decrease in motivation to participate by 19% for every one unit increase of missing anonymity. Thus, H2a is supported. The second constraint recognition, ‘member unfamiliarity’, does not have a significant influence on ‘motivation to participate in online firestorms’, $ß = -.01$, $t(216) = -.64$, $p = .53$, rejecting H2b. The construct ‘involvement recognition’ does not have a significant effect on the dependent variable either, $ß = .01$, $t(216) = .10$, $p = .92$. Consequently, H3 is not supported. ‘Collective identity’ shows a positive significant relationship with ‘motivation to participate in online firestorms’, $ß = .43$, $t(216) = 6.28$, $p < .001$, causing the latter to intensify by 43% for every one unit increase of ‘collective identity’. Hence, H5 is supported. The predictor ‘community efficacy’ does not have a significant effect on the response variable, $ß = .14$, $t(216) = 1.84$, $p = .07$, resultant in the rejection of H6.

The addition of emotional predictors, for instance ‘need to vent negative emotions’, ‘need to take revenge’ and ‘moral obligation to warn others’, significantly increased the variance accounted for in ‘motivation to participate in online firestorms’ by 10% after controlling for the variables adopted from Gruber et al. (2019), $R^2 = .36$, $F(3, 213) = 13.17$, $p < .001$.
Overall, the final model accounted for approximately 36% of variance in ‘motivation to participate in online firestorms’, $R^2 = .36$, $F(8, 213) = 16.79$, $p < .001$.
Two of the three emotional determinants proved to significantly influence ‘motivation to participate in online firestorms’. While the need to take revenge does not cause motivation to participate, $ß = .07$, $t(213) = .88$, $p = .38$, the latter is triggered by ‘need to vent negative emotions’, $ß = .24$, $t(213) = 3.20$, $p < .01$, and ‘moral obligation to warn others’, $ß = .41$, $t(213) = 4.38$, $p < .001$. It follows that H8 is not supported but H7 and H9 are.

Table 5

Hierarchical Regression Analysis of Predictors of Motivation to Participate in Online Firestorms

Model statistics

	Adj. R²	*F-value*	*Sig.*
Model 1: STOPS and Collective Predictors	0,256	16,22	,00***
Model 2: STOPS and Collective Predictors + Emotional Predictors	0,364	16,79	,00***

Regression coefficients

	ß	*t-value*	*Sig.*
Model 1: STOPS and Collective Predictors (Δ Adj. R² = 0,256)			
Non-anonymity	-0,192	-3,302	,00***
Member unfamiliarity	-0,038	-0,637	0,53
Involvement recognition	0,009	0,098	0,92
Community efficacy	0.144	1,839	0,97
Collective identity	0,425	6,278	,00***
Model 2: STOPS and Collective Predictors + Emotional Predictors (Δ Adj. R² = 0,108)			
Non-anonymity	-0,19	-3,37	,00***
Member unfamiliarity	-0,04	-0,72	0,48
Involvement recognition	-0,16	-1,69	0,09
Community efficacy	0,00	0,02	0,98
Collective identity	0,27	4,03	,00***
Need to vent negative emotions	0,24	3,20	,00**
Need to take revenge	0,07	0,88	0,38
Moral obligation to warn others	0,41	4,38	,00***

**** Relationship is significant at the 0.001 level*
*** Relationship is significant at the 0.01 level*

4.4 Additional Analysis

The theoretical foundation of this study revealed that ‘collective identity’ had been shown to significantly mediate the relationship between ‘community efficacy’ and collective action. Concurrently, previous studies confirmed an independent positive relationship between ‘community efficacy’ and collective action so that the current study hypothesized a similar outcome. Given that in the current study ‘community efficacy’ has no causal relationship with ‘motivation to participate in online firestorms’, it was decided to test for a possible mediation effect of ‘collective identity’ on the relationship between ‘community efficacy’ and ‘motivation to participate in online firestorms’.

In accordance with this decision, simple bivariate and multiple regression analyses were conducted following the three-step approach of mediation by Baron and Kenny (1986). Thereafter, the results of the regression analyses were run in a Sobel test showing whether the intervening variable significantly carries the influence of the independent variable on the dependent variable. The results are presented in Figure 2.

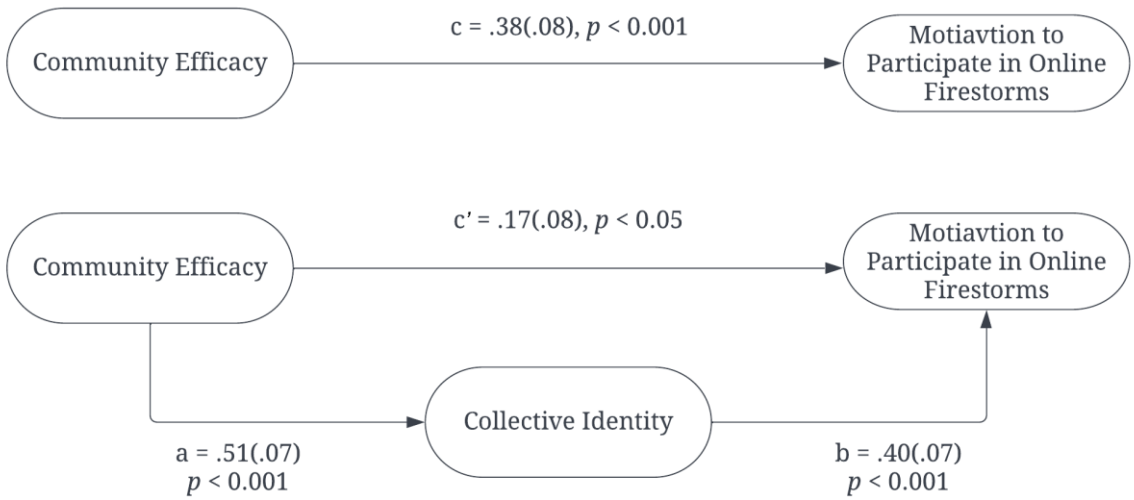
First, it was investigated whether the independent variable ‘community efficacy’ significantly correlated with the dependent variable ‘motivation to participate in online firestorms’. The results confirmed a causal relationship between the variables (c = .38, sc = .08, p < .001), fulfilling the first criterion of mediation.

During the second analysis it was assessed whether the independent variable ‘community efficacy’ significantly correlated with the mediating variable ‘collective identity’. This was found to be the case (a = .51, sa = .07, p < .001), so a multiple regression analysis was performed. Within this analysis, ‘motivation to participate in online firestorms’ was set as the dependent variable whilst ‘community efficacy’ and ‘collective identity’ acted as independent variables. This step tested whether ‘community efficacy’ significantly influenced ‘motivation to participate in online firestorms’ whilst controlling for ‘collective identity’. Here, the mediating variable ‘collective identity’ significantly influenced the dependent variable ‘motivation to participate in online firestorms’ (b = .40, sb= .07, p < .001).

The influence of ‘community efficacy’ on ‘motivation to participate in online firestorms’ remained significant with the mediating variable included in the regression (c' = .17, sc' = .08, p < .05), indicating partial mediation. To confirm whether the mediating variable indeed carries the influence of the independent variable, a Sobel test was performed. The results confirmed the mediation effect to be significant (Sobel z = 5.29, p < .001). Consequently, ‘collective identity’ was found to partially mediate the relationship between ‘community efficacy’ and ‘motivation to participate in online firestorms’.

Figure 2

Mediation Model of ‘Collective Identity’ Mediating the Relationship Between ‘Community Efficacy’ and ‘Motivation to Participate in Online Firestorms’



4.5 Final results

A complete overview of the hypotheses is presented in Table 6. All tested hypotheses are categorized into supported and rejected hypotheses. Hypotheses that were not tested since the corresponding constructs were dissolved and consequently excluded from the data analysis are labelled ‘construct dissolved’.

Table 6

Overview of Supported and Rejected Hypotheses

H1	Problem recognition positively relates to motivation to participate in online firestorms	Construct dissolved
H2a	Non-anonymity in social media platforms negatively relates to motivation to participate in online firestorms	Supported
H2b	Member unfamiliarity negatively relates to motivation to participate in online firestorms	Rejected
H3	Involvement recognition positively relates to motivation to participate in online firestorms	Rejected
H4	Slacktivism positively relates to motivation to participate in online firestorms	Construct dissolved
H5	Collective identity positively relates to motivation to participate in online firestorms	Supported
H6	Community efficacy positively relates to motivation to participate in online firestorms	Rejected
H7	The need to vent negative emotions positively relates to motivation to participate in online firestorms	Supported

H8	The need to take revenge positively relates to motivation to participate in online firestorms	Rejected
H9	Moral obligation to warn others positively relates to motivation to participate in online firestorms	Supported

5. Discussion of Results, Limitations, Implications and Conclusion

5.1 Discussion of Results

In our increasingly polarised and mediatised society, the expression of personal views on socio-political issues on social media is no longer a rarity, but a daily part of today's public discourse (e.g., Conway et al., 2015; Heiss, 2020; Kim et al., 2014; Tufekci, 2013; Valenzuela, 2013; Zhang et al., 2021). The study at hand has sought to explore the most aggressive form of public opinion expression on the internet, i.e., online firestorms, and aimed to shed light on the emergence and spread of the latter by examining emotional factors that drive motivation to engage in online firestorms.

The dependent variable, 'motivation to participate in online firestorms', was found to show a significant relationship with four of the eight predictor variables researched, namely 'non-anonymity', 'collective identity', 'need to vent negative emotions' and 'moral obligation to warn others'. The latter two constructs represent two of the three emotional factors the theoretical model of firestorm participation by Gruber et al. (2019) was extended with.
By a large margin, 'moral obligation to warn others' revealed to be the strongest driver for 'motivation to participate in online firestorms', which allows to anticipate the significance of this emotional determinant for online protest behaviour before discussing this construct in detail in the remainder of this paper.

The positive direct relationship between 'collective identity' and 'motivation to participate in online firestorms' proved respondents who felt a strong sense of belonging to a group to be more likely to take part in an online firestorm than respondents who did not perceive this connection. This finding is in line with the results of the survey by Gruber et al. (2019) even revealing collective identity to be the strongest driver of participation in the fictious online firestorm they portrayed. The researchers saw this outcome as evidence for the acknowledgement of Kim et al. (2010) who said that creating a sense of community may be even more relevant to participants of online discussions than actually solving the problem at stake, as proclaimed by STOPS.

In addition, the direct relationship between 'collective identity' and the motivation to participate provides further evidence for Thomas et al. (2015) who found a positive relationship between collective identity and collective action. Their explanation for the causal

relationship roots in the very nature of any form of online discussion – the interaction between its participants. Once group interaction is characterized by a high degree of consensus that stems from shared thoughts, beliefs and attitudes among the discussants, the online communication process accounts for an intensified commitment to action intentions (Thomas et al., 2015) as group members are eager to establish (or change) a particular state of affairs (Smith et al., 2014). Simultaneously, interaction in online discussions strengthens group ties as well as the perceived central role of the group within an individual's identity (Thomas et al., 2015), so much so that sympathizers happen to be politicized and under certain circumstances even become radicalized (Thomas et al., 2013). A potential radicalization of participants in online discussions might well explain the willingness to post aggressive and uncivil comments fuelling an online firestorm.

Further, the outcomes of this study showed that 'non-anonymity' negatively relates to 'motivation to participate in online firestorms' and confirms a lack of anonymity on social media to be hindering a person's motivation to participate in online firestorms. Such constraint recognition reflects the findings of Gruber et al.'s (2019) theoretical model on firestorm participation and further supports the outcomes of Porten-Chée & Eilders (2015) and Bargh et al. (2002). Both identified people to be more willing to express their opinion in an anonymous environment as the potential risk of social sanctions or disapproval from peer groups is not present. The aforementioned risk occurs as soon as social media users can be identified through their profile since any participation behaviour on their part, including liking, sharing or commenting on social media content, is not only publicly visible but can be traced back to their person. As a result, family and friends or similar reference groups important to the user might feel offended or wish to distance themselves from the latter due to opposed attitudes. A resulting social exclusion from above-mentioned reference groups subsequently poses a threat and can develop into fear hindering social media users to engage in online discussions in a non-anonymous social media environment.

Regarding the emotional determinants of this research, 'venting negative emotions' proved to cause 'motivation to participate in online firestorms'. This relationship is mirrored by the findings of Diakopoulos & Naaman (2011), Hennig-Thurau et al. (2004) and Sundaram et al. (1998). They discovered that voicing negative feelings through firestorm participation can lessen frustration and act as a valve for negative feelings. As the perception of intense negative emotions causes a state of dissonance, the affected have the desire to reduce such

feelings of dissonance and reinstate internal balance. A prevalent remedy for internal dissonance reduction is the engagement in online complaint behaviour (Diakopoulos & Naaman, 2011; Hennig-Thurau et al., 2004). Here, those affected can unburden themselves by voicing negative feelings and receiving moral support by sympathizers who have made similar negative experiences which they share with the online community (Diakopoulos & Naaman, 2011; Hennig-Thurau et al., 2004).

The second emotional predictor that has a positive effect on 'motivation to participate in online firestorms' is 'moral obligation to warn others'. This altruistic motive of warning other people about perceived (corporate) wrongdoing has been previously shown to lead to negative experiences being shared online (Hennig-Thurau et al., 2004; Lee & Kim, 2020; Yap et al., 2013).
While Yap et al. (2013) looked into consumers' motives of negative eWOM complaining about faulty products and unsatisfactory services, Hennig-Thurau et al. (2004) and Lee & Kim (2020) studied employees' intentions to spread negative organization-related information on social media. All researchers identified altruistic motives such as the moral obligation to warn others as significant drivers for intentions to communicate indignation online but neglect to discuss reasons behind the megaphoning behaviour.

A recent experiment on intentions to engage in online firestorms filled this gap linking the moral obligation to warn others to an individual moral compass (Johnen et al., 2017). This compass directs people based on deep, genuine attitudes and sentiments that demand to be defended upon violation by deviant actors (Johnen et al., 2017). The perceived transgression of both intrinsic moral values and perceived social norms represents a threat for the affected (Rost et al., 2016) projected onto society at large, which subsequently stimulates the desire to join an online firestorm with the purpose to warn others of perceived violation and resulting threat (Eisenberg, 2000; Lindenmeier et al., 2012).
While the violation of aforementioned intrinsic moral values accounts by far for the strongest predictor of firestorm participation in the empirical study at hand, the very same phenomenon was less of an explanation for participation in online firestorms in Johnen et al.'s (2017) experiment in which the "perceived social appropriateness of attacking the denounced actor" (p. 3155) was dominating the causal relationship with opinion expression in online firestorms. More specifically, the desire to contribute to the verbal attack of an online firestorm is amplified as soon as the collective outrage against the attacked is perceived to be reasonable

(Johnen et al., 2017). In this case, an individual is more apt to identify with the acting community and adapts to corresponding group behaviour (Spears et al., 1990; Tajfel & Turner, 1986).

The remaining four independent constructs, ‘need to take revenge’, ‘community efficacy’, ‘member unfamiliarity’ and ‘involvement recognition’, were not found to have a significant influence on ‘motivation to participate in online firestorms’ although the model hypothesized so.

To begin with, the emotional determinant, ‘need to take revenge’, did not seem to trigger ‘motivation to participate in online firestorms’ in this study. This contradicts findings of previous studies validating a causal relationship between the need to punish an organization for their wrongdoing and the subsequent expression of this need by means of negative eWOM or firestorm participation (Gregoire et al., 2009, Sundaram et al.,1998; Whiting et al., 2019). This scientific inconsistency may have its roots in the nature of corporate misconduct respondents experienced.
While the results of Gregoire et al. (2009), Sundaram et al. (1998) and Whiting et al. (2019) were obtained in the event of a dissatisfying consumption experience triggering the experimentees’ need to take revenge, participants in the current study were not exposed to a negative consumption experience. Instead, they witnessed a corporation’s inappropriate advertisement. This experience might not have been strong enough to elicit the desire to take revenge on the company as the subjects were not directly affected by the corporate wrongdoing. The need to seek vengeance against the company, that is, BMW in this study, for a wrong done to themselves did therefore not build since participants were not personally affected. As a result, motivation to participate in online firestorms might not have been caused by the need to take revenge as the latter was not triggered by the stimulus of this research.

Among the two constructs with a collective nature, perceived ‘community efficacy’ showed no significant effect on ‘motivation to participate in online firestorms’, which is in accordance with the survey data of Gruber et al. (2019). Interestingly, in the context of ‘collective identity’, the perception of being a collective actor substantially activated participatory intentions. A study by Thomas et al. (2015) which found group efficacy to significantly prompt social identity while the latter caused collective action further explains a significant relation between ‘collective identity’ and motivation to participate as well as the absence of

such between ‘community efficacy’ and motivation to participate. When the researchers could not confirm a significant path between group efficacy beliefs and collective action, they tested a mediating effect of social identity on the relationship between group efficacy beliefs and collective action yielding a significant outcome. Following this finding, it was reasonable to assume that ‘collective identity’ is playing a similar role in the data of this survey, mediating the relationship of perceived ‘community efficacy’ and ‘motivation to participate in online firestorms’. Accordingly, mediation was tested in an additional analysis confirming the aforementioned assumption. Consequently, ‘collective identity’ effectively accounts for the variation of ‘motivation to participate in online firestorms’ hypothesised to be associated with ‘community efficacy’ in the outset of this study. This explains the current lack of causality between perceived ‘community efficacy’ and ‘motivation to participate in online firestorms’.

Contrary to the hypothesis, unfamiliarity with other firestorm participants did not cause a significant constraint for motivation to engage in online firestorms. This outcome contradicts the reasoning of the spiral of silence theory (SOS) in the context of online communication and runs counter to findings following SOS (Askay, 2014; Moy et al., 2001). These studies confirmed social media users to be less motivated to express negative views in the sole presence of strangers as they are not subjected to the social pressure of conformity with posted comments of their peers. The current study deviates from the aforementioned findings.

The absence of a significant constraint for motivation to participate represented by ‘member unfamiliarity’ might ground in a varying impact of member (un)familiarity on motivation to post negative comments dependent on the intensity of the negativity expressed, as Orengo Castellá et al. (2000) discovered. The researchers differentiated two forms of uninhibited communication on the basis of intensity, that is, informal speech as a mild version of the latter and the comparatively aggressive act of flaming. The categorization allowed to identify that a significant relationship between groups with high familiarity among members and the practice of uninhibited communication exclusively applied to its mild form, informal speech. This might explain the rejection of the hypothesized constraint of ‘member unfamiliarity’ in the current research.

After all, social media posts adding to online firestorms contain negative expressions whose intensity go far beyond informal speech. In fact, the nature of voiced discontent in online firestorms resembles to a substantial degree the communicative acts of flaming (e.g., Dvorak, 1994; Korenman & Wyatt, 1996; O’Sullivan & Flanagin, 2003; Parks & Floyd, 1996;

Thompsen & Foulger, 1996) – a behaviour that was found not to be caused by member familiarity (Orengo Castellá, 2000). Conversely, it is not far-fetched to conclude that 'member unfamiliarity' does not hold back the willingness to engage in aggressive communication behaviour.

Last and most unexpected, 'involvement recognition' did not appear to cause 'motivation to participate in online firestorms' in this study. Despite the contrasting hypothesis and confirmatory results of Gruber et al. (2019), this outcome may be comprehensible when re-examining the conceptualization of 'involvement recognition'. While the latter was universally understood as perceived connectedness with a problem or situation, conceptualizations of involvement in related research differentiated between cognitive and affective involvement (Ziegele et al., 2017). Both forms of involvement were found to guide users' intentions to publicly respond to media content with commenting behaviour. These intentions though, arise differently as they depend on the characteristics of the media content that triggered them. Cognitive involvement occurs when the stimulus connects to a person's knowledge, values and interests (Johnson & Eagly, 1989). Unlike, negative affective involvement is provoked by online information that potentially threatens an individual's overall well-being, disrupts self-imposed goals, or disconfirms personal perceptions of reality (Rimé, 2009; Shoemaker & Cohen, 2005).
Such differentiation of involvement has proven itself. Ziegele et al.'s (2017) experimental research revealed that cognitive involvement less likely incites participants to write aggressive, let alone uncivil comments while negative affective involvement does so with far greater likelihood.

These findings indicate that the lack of causality between 'involvement recognition' and 'motivation to participate in online firestorms' can be traced back to the characteristics of the stimulating firestorm content and the resulting type of involvement. Looking at the BMW advertisement in light of a unanimous environmentally concerned sample, it is questionable whether the downplay of climate change is strong enough to have threatened an individual's overall well-being or disrupted self-imposed goals – both attributes provoking negative affective involvement (Rimé, 2009; Shoemaker & Cohen, 2005).
Since the hypothesized subsequent motivation to impulsively post insulting comments fails to materialize in this research, the presumption of negative affective involvement triggered by the BMW advertisement might be ruled out. This assumption, however, should be treated

with caution, as states of mind and/or self-imposed goals related to environmental concern may have been violated, which has shown to trigger respondents' negative affective involvement in previous studies (Rimé, 2009; Shoemaker & Cohen, 2005).
Alternatively, it is fairly probable that BMW's advertisement has produced a connection with the respondents of this study based on their knowledge, values and interests that testified extensive environmental concern in the socio-demographic parameters. Such connection would benefit a factual discussion that draws civilized attention to the inappropriateness of BMW's advertising against the backdrop of dwindling habitats in light of global warming. This less intense from of involvement would stimulate participation behaviour via the cognitive involvement route resulting in comparatively thoughtful and factual comments and might be as good as a means to an end of rectification of the issue at hand while refraining from aggressive and insulting communication behaviour.
A study researching motivation to participate in online discussions less aggressive than firestorms might have confirmed cognitive involvement of its respondents resulting in motivation to show civilized communicative actions.

5.2 Limitations and Recommendations for Further Research

It is plausible that a number of limitations have influenced the obtained results. As respondents were recruited based on convenience and snowball sampling, the young adults in this study were predominantly university students with a strong academic background. Individuals who testify academic achievement are mostly found to have grown up in households with higher socio-economic status (SES) (e.g., Caro et al., 2009; Currie, 2009; Heyneman, 1976; Raju, 2016) as the financial means to cover university education are given (e.g., Caro et al., 2009; Currie, 2009; Heyneman, 1976; Raju, 2016). These childhood conditions impact an individual's sense of control and degree of impulsivity when confronted with information referring to environmental uncertainty (Mittal & Griskevicius, 2014).

Experiments by Mittal & Griskevicius (2014) have revealed adults brought up in households with high SES to experience a higher sense of control in light of environmental uncertainty than those from low-SES childhoods. For the degree of impulsivity, people from wealthier backgrounds were confirmed to be less impulsive when exposed to information on environmental uncertainty than people from poorer backgrounds.
Although this study did not collect information on respondents SES during their childhood, previous research has shown people with strong academic background to often come from

households with strong SES (e.g., Caro et al., 2009; Currie, 2009; Heyneman, 1976; Raju, 2016).

In light of the current sample showing almost entirely strong academic backgrounds, the findings of Mittal & Griskevicius (2014) might have hindered online firestorm participation due to a comparatively low level of impulsivity limiting the willingness to add to aggressive, let alone insulting comments in an online firestorm. Regarding the relatively high sense of control over the environmental uncertainty respondents were exposed to, a systematic error in judgement of control over highly uncertain conditions (Mittal & Griskevicius, 2014) might have occurred. The latter could have made the necessity to help correct the issue at hand through firestorm participation seem redundant as respondents did not feel threatened by the environmental uncertainty, that is, climate change, referred to in the BMW advertisement. Presuming the aforementioned research findings hold true, it is probable that the results of this study regarding the strength of motivation to participate in online firestorms may differ in a less homogeneous sample. Incorporating more diverse respondents in a similar study is hence recommended for future research.

Further, this study is limited to firestorm scenarios related to environmental disregard since the chosen firestorm stimulant portrayed the denigration of climate change. This event-related arousal can be assigned to firestorms that cause perceived moral misconduct resulting in feelings of anger and indignation on the part of the recipients (Einwiller et al., 2016). Despite a considerable dominance of firestorms in the German (social) media landscape that are related to perceived moral misconduct (Einwiller et al., 2016), it is questionable whether the results of this study can be equally applied to firestorms triggered by perceived market misconduct (e.g., faulty product, bad service, unreasonable price) or perceived violation of honour or reputation (e.g., perceived unjust assault of a person or organization). This is because the latter stimulants respectively account for recipients' perceived frustration and dissatisfaction (Einwiller et al., 2016). A generalization of the findings of this research to all firestorms, regardless of their stimulants, should therefore be treated with caution.

Moreover, this study relates to only one cultural area. The sample was entirely German and thus exclusively based on cultural characteristics in accordance with German nationality. Following Hofstede (2011), Germany is characterised by a relatively individualistic and masculine culture resulting in low-context communication in which people tend to be very

frank and direct. This is paired with a high level of assertiveness and comparatively less willingness to cooperate. In line with this is Trompenaars' (1996) cultural classification of German citizens who consider their environment to be largely controllable by themselves resulting in less willingness to adapt to given circumstances and maintain harmony in society. Particularly the latter characteristic was confirmed in the framework of the *Global Leadership and Organizational Behaviour Effectiveness* (GLOBE) study (House et al., 2002) revealing Germans to rank among the most decisive nationalities with a strong tendency to behave contentiously in social interactions.
Presuming the findings of the above intercultural studies hold true, the insights from this research are not representative for firestorm scenarios in opposing cultures, primarily built on feminine attributes, e.g., Scandinavian countries, and/or collectivistic attributes, e.g., Asian countries, where communication styles, degree of assertiveness and perceived self-efficacy contrast (Hofstede, 2011; House et al., 2001; Trompenaars, 1996). Further research should consider to explore the influence of cultural characteristics on communicative participation intentions from a qualitative approach as the latter provides in-depth insights into the dynamic forces of voice and silence in this context (Greenberg & Edwards, 2009).

A fourth limitation might represent the phase in which this research was conducted. Society has reached a point where climate change is clearly noticeable as accumulating extreme weather events have shown. The unprecedented flooding in large areas of Western Germany in the summer of 2021 is exemplary for most recent events of extreme weather. The resultant, increasingly visible necessity to consider and treat climate change as a salient issue paired with an environmentally concerned sample that recently witnessed the threats of global warming in their own country might have influenced respondents' reaction to some of the variables in this study. Constructs related to the perceived importance of climate change, for instance 'involvement recognition', 'moral obligation to warn others', 'need to vent negative emotions' and motivation to participate in the portrayed firestorm might have been less pronounced if this survey was conducted at an earlier point in time. It would therefore be interesting to investigate whether a firestorm similar to the current one would elicit differing reactions if people encountered it a decade ago, where environmental issues were not as much on the societal agenda as today.

Last, this research hypothesized social media users' motivation to participate in online firestorms across platforms. Specific environmental characteristics of differing social media

sites were hence neglected. This shortcoming could be alleviated by future research examining the impact of platform-specific communicative affordances on intentions to participate in heated online debates. After all, it has been acknowledged that system designers convey moral and social values into the interfaces they create (Friedman, 1997) which in turn might exert control over user decisions to communicate or suppress negative views (Jiang & XU, 2009). Accordingly, future researchers are well advised to focus on firestorm participation on a distinct social media site and consider the repercussions of platform-specific communicative affordances on the willingness to voice negative views.

Independent of the addressed limitations, one avenue for future research constitutes the linguistic context in which an online firestorm occurs. As the phenomenon is designated differently depending on the language spoken, diverse meanings in accordance with the term used in specific language-based regions are associated with the same spectacle of online outrage (Williams, 2013). In German-speaking regions, for example, a firestorm is exclusively known under the metaphorical designation ‘shitstorm’ (Einwiller et al., 2016) which suggests that journalists are particularly keen on reporting on such online protest movements because they are very skilful in embellishing them linguistically (Einwiller et al., 2016).
These linguistic variants invite scholars to examine the extent to which different metaphors that describe online firestorms in the media influence internet users’ perception and meaning assigned to the latter.

Finally, this study would like to point to the importance of social media users’ emotional states as powerful drivers of motivation to participate in online firestorms. Despite the common belief that opinion expression is mostly accompanied by cognitive processes, behavioural intentions towards opinion expression are frequently enthused by affects such as anger, anxiety or enthusiasm (Berger, 2014; Berger & Milkman, 2012; Heiss, 2020). These earlier discussed high-arousal or action-relevant emotions (Berger & Milkman, 2012; Berger, 2014; Thomas et al., 2015) have been found to not only stimulate online discussions but also account for an added emotionalization of comments in online debates (Heiss, 2020). The more emotionalized social media content is, the more viral it becomes (Berger & Milkman, 2012; Borah, 2016, Heath et al., 2001; Heiss et al., 2018) contributing to the scale and reach of each firestorm.

Conditions for and effects of any forms of high-arousal emotional involvement is therefore worth to be explored further when examining motivation to partake in (contentious) online debates. While the study at hand has provided evidence for the latter to be triggered by the need to vent negative emotions and warn others of moral misconduct – two determinants respectively associated with the emotions of anger and fear – it did not touch on positive states of high arousal, as enthusiasm for instance. An immersion in positive action-relevant emotions would thus significantly enrich the academic corpus of behavioural intentions evoked by positive forms of mental arousal, potentially interesting for participation in political campaigns or more constructive online discussions than firestorms.

In what follows, this study considers academic implications for researchers in related fields and practical implications for both, entities under attack of online firestorms and socio-political players that benefit from the insights of the current findings.

5.3 Implications

The findings of this study are valuable in various ways. Additional knowledge on psychological mechanisms and emotional determinants that incite social media users' motivation to engage in aggressive commenting within the frame of online firestorms may play a salient role in attenuating the increasing polarization and fragmentation of society.

5.3.1 Academic Implications

From an academic viewpoint, this study has extended a theoretical model on firestorm participation that was rooted in the assumptions of STOPS and applied to the domain of online communication in previous research by Gruber et al. (2019). In doing so, the current study examined problem-solving and collective factors that might explain motivation to participate in online firestorms with a particular focus on high-arousal emotional determinants. In other words, the problem-solving and collective predictors adopted from the model of Gruber et al. (2019) accounted for 26% of the variation in motivation to participate in online firestorms, which is substantially lower than the R^2 value of 43% determined by Gruber et al. (2019) when controlling for demographics, frequency of social media use and personal attributes. This challenges the predictive power of problem-solving and collective determinants for intentions to participate in online firestorms. Further, this outcome stresses the importance of including high-arousal emotional predictors into the theoretical model on motivation to participate in online firestorms. The latter was shown to increase variation in

‘motivation to participate in online firestorms’ by approximately 10% upon extension with emotional predictors. All told, the model of this research explained approximately 36% of total variance, indicating solid predictive power for future research in the field of (contentious) online opinion expression.

Regarding the constructs of this research, factor analysis revealed the variables ‘problem recognition’ and ‘involvement recognition’ to measure one single component instead of two distinct ones. This implies to carefully consider the substantive relationship between the two variables and conceptualize them with more distinct statements in further research attempts to benefit from a more precise measurement instrument.
One way to achieve this would be to precisely elaborate on the differing extents to which an issue is recognized as a problem. In detail, this means that it should become clear whether a person solely recognizes an issue as a general problem without feeling personally connected to it (problem recognition) or if the same issue is recognized as a problem with which specific consequences are associated that are being perceived to have an immediate effect on the person and/or people who are close to this person (involvement recognition). This distinction should serve as a foundation upon which subsequent conceptualization of both constructs can be built.
Similarly, the predictor ‘involvement recognition’ demands a thorough conceptualization in which the dissimilarities of cognitive and affective involvement are implied.

5.3.2 Practical Implications

Additionally, the current results hold practical implications for interest groups and activists, economic actors and governments.
The demonstrated importance of perceived connectedness to a collective for participatory intentions could provide incentives for interest groups and activists in their attempt to mobilize people more effectively. In the absence of a significant path between perceived community efficacy and motivation to participate, this research has discussed the intervening role of collective identity as a potential reason. Accordingly, interest groups and activists are well advised to not exclusively focus on group efficacy in their attempts to foster collective action but similarly create an environment fruitful for a strong sense of belonging among members of their community.

From an organizational point of view, it is of interest to primarily interact with stakeholders on social media platforms from which users notably benefit when acting under their real name rather than under an alias. The non-anonymous environment has proven to hinder people's willingness to contribute to online firestorms. In the event of an organization under verbal attack of an online firestorm, the latter might be less pronounced in terms of scale, intensity and virality on non-anonymous social media platforms. Equally important is a thorough consideration of the socio-political issue an organization refers to in its online content. Inappropriate use of sensitive issues might violate moral standards which can subsequently incite users to feel obligated to warn others of the perceived moral misconduct. In this study, such arousal showed to most strongly stimulate motivation to participate in online firestorms. To prevent online outrage and protect their reputation, organizations should carefully assess beforehand whether to post advertisements connected to sensitive socio-political issues and view extra corporate political engagements in light of potential societal backlash.

The above-described repercussions of citizens' moral obligation to warn other members of society in the event of perceived wrongdoings can be understood as a testament to the vitality of democratic values. This might reassure governments that the rule of law does not only function in correspondence with the legal framework but unwritten rules are equally internalized and followed by members of society. Especially in the absence of national government regulatory power on supranational corporations, online firestorms might represent a social tribunal exerted through aggressive and unanimously shared opinions online. Such universal outrage on social network sites can easily spill over to mainstream media, reaching a larger circle of recipients so that actual loss of political control is socially reinstated. In this way, supranational corporations are put in their place.

5.4 Conclusion

Online firestorms are bulletproof testimony to what is aggressively denounced by (segments of) society at a certain point in time. Such belligerent attitude in public explains the negative connotation widely attributed to the concept of online firestorms condemning participation in the latter (Einwiller et al., 2016). This raises questions about the motives of firestormers who seem unaffected by the condemnation of such participation.

In response to these questions, the current research tried to shed light on the influence of problem-solving and collective factors on motivation to participate in online firestorms with

particular attention to emotional determinants in order to complement the currently sparse research on participatory intentions of those involved in firestorms. The latter have shown motivation to engage in online firestorms when burdened with negative emotions they need to vent and the perceived moral obligation to warn others of observed misconduct. In accordance with prevailing findings of related studies, a non-anonymous online environment constrained willingness to contribute to firestorms while the feeling of belonging to a collective further promoted the motivation to participate. Contrary to the model, neither perceived involvement with an issue nor the need to take revenge led to participatory intentions.

These insights into social media users' motivation to participate in online firestorms not only elucidate underlying psychological mechanisms and stress the importance of high-arousal emotions but also touch on potential socio-political goals civic protesters seek to achieve. After all, the intentions to participate in online firestorms might not be as bad as they seem at first glance.

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Appendix A
Questionnaire in Qualtrics

Survey Questionnaire Online firestorms

Start of Block: Begrüßung & Consent

Q20 Click to write the question text
Browser
Version
Operating System
Screen Resolution
Flash Version
Java Support
User Agent

Q14
Danke, dass Du dir die Zeit nimmst, an meiner Umfrage zu Online Shitstorms teilzunehmen. Das Ziel meiner Studie ist herzauszufinden, was deine Einstellungen zu Online Shitstorms sind. Was ein Online Shitstorm ist, wird in einem kurzen Video erklärt und mit einem realen Shitstorm veranschaulicht.

Bevor Du mit der Umfrage beginnst, möchte ich dich darauf hinweisen, dass dir keine sensiblen Fragen gestellt werden. Das Risiko, während der Umfrage Unbehagen zu verspüren, kann jedoch nicht gänzlich ausgeschlossen werden. Solltest Du dich unwohl fühlen, kannst Du die Umfrage jederzeit abbrechen. Die Teilnahme an dieser Umfrage ist vollkommen freiwillig. Deine Antworten werden vertraulich behandelt, indem die Antworten anonym aufgezeichnet und die Daten sicher gespeichert werden.

Bei Fragen kannst Du mich gerne kontaktieren unter:
j.kock-1@student.utwente.nl

Durch Klicken auf „Ich verstehe“ bestätigst Du, dass Du die obigen Informationen gelesen und verstanden hast und der Teilnahme an der Umfrage zustimmst.

☐ Ich verstehe

End of Block: Begrüßung & Consent

Start of Block: General Questions

Q14 In diesem Abschnitt stelle ich einige generelle Fragen zu deiner Person.

Q15 Was ist dein Geschlecht?

- Männlich
- Weiblich
- Ich identifiziere mich nicht als männlich oder weiblich
- keine Angabe

1 *

Q16 Was ist dein Alter?

_____

Q21 Was ist der höchste Bildungsabschluss, über den du derzeit verfügst?

- Kein Schulabschluss
- Hauptschul- oder gleichwertiger Abschluss
- Realschul- oder gleichwertiger Abschluss
- Abitur oder gleichwertiger Abschluss
- Bachelor-Abschluss
- Master-Abschluss
- Doktor-Grad

Q23 Lebst du aktuell in Deutschland?

- ○ Ja
- ○ Nein

Display This Question:

If Lebst du aktuell in Deutschland? = Ja

Q22 In welchem Bundesland lebst du?

- ○ Baden-Württemberg
- ○ Bayern
- ○ Berlin
- ○ Brandenburg
- ○ Bremen
- ○ Hamburg
- ○ Hessen
- ○ Mecklenburg-Vorpommern
- ○ Niedersachsen
- ○ Nordrhein-Westfalen
- ○ Rheinland-Pfalz
- ○ Saarland
- ○ Sachsen
- ○ Sachsen-Anhalt
- ○ Schleswig-Holstein
- ○ Thüringen

Q17 Hast Du dich schon mal an einem Online Shitstorm beteiligt?

- ○ Ja
- ○ Nein
- ○ Ich bin mir nicht sicher

Q18 Erachtest Du umweltbezogene Themen (wie z.B. Klimawandel) als ernste Probleme?

- ○ (Eher) ja
- ○ (Eher) nein

End of Block: General Questions

Start of Block: Introductory Video

Q14 Was ein Online Shitstorm ist, erkläre ich in folgendem Video. Bitte schau dir das Video an und beantworte die darauffolgenden Fragen.

End of Block: Introductory Video

Start of Block: Problem recognition

Q1 Die folgenden Aussagen beziehen sich auf den Mercedes-Shitstorm. Lies dir die Aussagen sorgfältig durch und gib die Antwort deiner Wahl an.

	Stimme überhaupt nicht zu	Stimme nicht zu	Stimme eher nicht zu	Stimme weder zu noch nicht zu	Stimme eher zu	Stimme zu	Stimme voll und ganz zu
Dieses Thema (Klimawandel) stellt ein echtes Problem dar.	○	○	○	○	○	○	○
Ich denke, dass dieses Thema (Klimawandel) ernste gesellschaftliche Konsequenzen hat.	○	○	○	○	○	○	○
Es muss etwas getan werden, um solch ein Problem (Klimawandel) zu vermeiden.	○	○	○	○	○	○	○

End of Block: Problem recognition

Start of Block: Constraint recognition - Non-anonymity

Q2 Die folgenden Aussagen beziehen sich auf den Mercedes-Shitstorm. Lies dir die Aussagen sorgfältig durch und gib die Antwort deiner Wahl an.

	Stimme überhaupt nicht zu	Stimme nicht zu	Stimme eher nicht zu	Stimme weder zu noch nicht zu	Stimme eher zu	Stimme zu	Stimme voll und ganz zu
Ich bin beunruhigt über die fehlende Anonymität, wenn ich an einer Diskussion zu solch einem Thema auf Social Media teilnehme.	○	○	○	○	○	○	○
Ich fühle mich unwohl, meine Meinung zu solch einem Thema auf Social Media zu äußern, da Social Media keine Anonymität gewährleistet.	○	○	○	○	○	○	○
Es fällt mir schwer, mich auf Social Media an der Diskussion zu solch einem Thema zu beteiligen, da ich nicht anonym agieren kann.	○	○	○	○	○	○	○

End of Block: Constraint recognition - Non-anonymity

Start of Block: Constraint Recognition - Member Unfamiliarity

Q3 Die folgenden Aussagen beziehen sich auf den Mercedes-Shitstorm. Lies dir die Aussagen sorgfältig durch und gib die Antwort deiner Wahl an.

	Stimme überhaupt nicht zu	Stimme nicht zu	Stimme eher nicht zu	Stimme weder zu noch nicht zu	Stimme eher zu	Stimme zu	Stimme voll und ganz zu
Ich fühle mich unwohl, mich an der Diskussion zu solch einem Thema auf Social Media zu beteiligen, da ich die meisten Menschen, die an der Diskussion teilnehmen, nicht kenne.	○	○	○	○	○	○	○
Es fällt mir schwer, mich an der Diskussion zu solch einem Thema auf Social Media zu beteiligen, da ich die meisten Menschen, die an der Diskussion teilnehmen, nicht kenne.	○	○	○	○	○	○	○

Ich beteilige mich nicht an der Diskussion zu solch einem Thema auf Social Media, da ich mit den meisten Menschen, die an der Diskussion teilnehmen, nicht vertraut bin.	○	○	○	○	○	○	○

End of Block: Constraint Recognition - Member Unfamiliarity

Start of Block: Involvement Recognition

Q4 Die folgenden Aussagen beziehen sich auf den Mercedes-Shitstorm. Lies dir die Aussagen sorgfältig durch und gib die Antwort deiner Wahl an.

	Stimme überhaupt nicht zu	Stimme nicht zu	Stimme eher nicht zu	Stimme weder zu noch nicht zu	Stimme eher zu	Stimme zu	Stimme voll und ganz zu
Ich denke, dass mich ein solches Problem (Klimawandel) persönlich betrifft.	○	○	○	○	○	○	○
Solch ein Problem (Klimawandel) und seine Konsequenzen gehen mich etwas an.	○	○	○	○	○	○	○
Solch ein Problem (Klimawandel) stellt besondere Konsequenzen für mich dar.	○	○	○	○	○	○	○
Solch ein Problem (Klimawandel) stellt besondere Konsequenzen für Menschen, die mir nahestehen, dar.	○	○	○	○	○	○	○

End of Block: Involvement Recognition

Start of Block: Slacktivism

Q5 Die folgenden Aussagen beziehen sich auf den Mercedes-Shitstorm. Lies dir die Aussagen sorgfältig durch und gib die Antwort deiner Wahl an.

	Stimme überhaupt nicht zu	Stimme nicht zu	Stimme eher nicht zu	Stimme weder zu noch nicht zu	Stimme eher zu	Stimme zu	Stimme voll und ganz zu
Ich kann dabei helfen, auf ein gesellschaftliches Problem aufmerksam zu machen, indem ich einen dazu relevanten Beitrag auf Social Media like, teile oder kommentiere.	○	○	○	○	○	○	○
Sobald ich meine Zustimmung auf Social Media durch Liken, Teilen oder Kommentieren eines Beitrags ausdrücke, zeige ich befürwortendes Verhalten.	○	○	○	○	○	○	○
Zu einem solchen Thema würde ich lieber auf Social Media Stellung beziehen als an einer Demonstration teilzunehmen.	○	○	○	○	○	○	○

End of Block: Slacktivism

Start of Block: Community Efficacy

Q6 Die folgenden Aussagen beziehen sich auf den Mercedes-Shitstorm. Lies dir die Aussagen sorgfältig durch und gib die Antwort deiner Wahl an.

	Stimme überhaupt nicht zu	Stimme nicht zu	Stimme eher nicht zu	Stimme weder zu noch nicht zu	Stimme eher zu	Stimme zu	Stimme voll und ganz zu
Das Posten von negativen Kommentaren auf Social Media hilft dabei, ein solches Problem (Verunglimpfung des Klimawandels) zu lösen.	○	○	○	○	○	○	○
Die Meinungen und Stimmen der Social Media Community zu solch einem Problem (Verunglimpfung des Klimawandels), können Druck auf die Verantwortlichen für das Problem ausüben.	○	○	○	○	○	○	○
Indem ich an der Diskussion zu solch einem Thema auf Social Media teilnehme, helfe ich der Social Media Community, dieses Problem (Verunglimpfung des Klimawandels) zu lösen.	○	○	○	○	○	○	○

End of Block: Community Efficacy

Start of Block: Collective Identity

Q7 Die folgenden Aussagen beziehen sich auf den Mercedes-Shitstorm. Lies dir die Aussagen sorgfältig durch und gib die Antwort deiner Wahl an.

	Stimme überhaupt nicht zu	Stimme nicht zu	Stimme eher nicht zu	Stimme weder zu noch nicht zu	Stimme eher zu	Stimme zu	Stimme voll und ganz zu
Sobald ich mich an der Diskussion zu solch einem Thema auf Social Media beteilige, fühle ich mich als Teil einer Gemeinschaft.	○	○	○	○	○	○	○
Sobald ich mich an der Diskussion zu solch einem Thema auf Social Media beteilige, fühle ich mich einer Gemeinschaft zugehörig.	○	○	○	○	○	○	○
Sobald ich mich an der Diskussion zu solch einem Thema auf Social Media beteilige, fühle ich mich mit anderen verbunden.	○	○	○	○	○	○	○

End of Block: Collective Identity

Start of Block: Venting Negative Emotions

Q8 Die folgenden Aussagen beziehen sich auf den Mercedes-Shitstorm. Lies dir die Aussagen sorgfältig durch und gib die Antwort deiner Wahl an.

	Stimme überhaupt nicht zu	Stimme nicht zu	Stimme eher nicht zu	Stimme weder zu noch nicht zu	Stimme eher zu	Stimme zu	Stimme voll und ganz zu
Sobald ich meine negative Meinung zu solch einem Thema äußere, verringert sich meine Wut.	○	○	○	○	○	○	○
Sobald ich meine Verärgerung zu solch einem Thema ausdrücke, fühle ich mich erleichtert.	○	○	○	○	○	○	○
Negative Dinge zu solch einem Thema zu posten, hilft mir, meinem Ärger Luft zu machen.	○	○	○	○	○	○	○

End of Block: Venting Negative Emotions

Start of Block: Taking Revenge

Q9 Die folgenden Aussagen beziehen sich auf den Mercedes-Shitstorm. Lies dir die Aussagen sorgfältig durch und gib die Antwort deiner Wahl an.

	Stimme überhaupt nicht zu	Stimme nicht zu	Stimme eher nicht zu	Stimme weder zu noch nicht zu	Stimme eher zu	Stimme zu	Stimme voll und ganz zu
Negative Dinge zu posten, ist für mich eine Möglichkeit, die Verantwortlichen für ein solches Fehlverhalten zu bestrafen.	○	○	○	○	○	○	○
Negative Dinge zu sagen, ermöglicht es mir, mich an den Verantwortlichen für ein solches Fehlverhalten zu rächen.	○	○	○	○	○	○	○
Negative Dinge zu sagen, ist meine Art, den Verantwortlichen für ein solches Fehlverhalten das Leben schwer zu machen.	○	○	○	○	○	○	○

End of Block: Taking Revenge

Start of Block: Moral Obligation to warn others

Q10 Die folgenden Aussagen beziehen sich auf den Mercedes-Shitstorm. Lies dir die Aussagen sorgfältig durch und gib die Antwort deiner Wahl an.

	Stimme überhaupt nicht zu	Stimme nicht zu	Stimme eher nicht zu	Stimme weder zu noch nicht zu	Stimme eher zu	Stimme zu	Stimme voll und ganz zu
Es ist richtig, andere Menschen über solch ein Thema zu informieren.	○	○	○	○	○	○	○
Ich fühle mich moralisch verpflichtet, andere Menschen über solch ein Thema zu informieren.	○	○	○	○	○	○	○
Ich halte es für moralisch vertretbar, andere Menschen über das Fehlverhalten der Verantwortlichen zu informieren.	○	○	○	○	○	○	○

End of Block: Moral Obligation to warn others

Start of Block: Motivation to participate in online firestorms

Q11 Die folgenden Aussagen beziehen sich auf den Mercedes-Shitstorm. Lies dir die Aussagen sorgfältig durch und gib die Antwort deiner Wahl an.

	Stimme überhaupt nicht zu	Stimme nicht zu	Stimme eher nicht zu	Stimme weder zu noch nicht zu	Stimme eher zu	Stimme zu	Stimme voll und ganz zu
Ich bin bereit, meine Meinung zu solch einem Thema zu äußern, indem ich die dazu veröffentlichten Beiträge auf Social Media kommentiere.	○	○	○	○	○	○	○
Ich bin motiviert, meine Zustimmung zu solch einem Thema auszudrücken, indem ich die dazu veröffentlichten Beiträge auf Social Media kommentiere.	○	○	○	○	○	○	○
Es besteht eine hohe Wahrscheinlichkeit, dass ich mich mit solch einem Thema auseinandersetze, indem ich die dazu veröffentlichten Beiträge auf Social Media kommentiere.	○	○	○	○	○	○	○

End of Block: Motivation to participate in online firestorms

Appendix B
Final measurement instrument

Overview of constructs, items, mean, standard deviation and Cronbach's alpha

Construct	Mean	Standard deviation	Cronbach's alpha	Items
Motivation to participate in online firestorms	3.13	1.54	0.94	
				I am driven to express my agreement on this issue by commenting upon the posted content.
				There is a high probability that I will engage in this issue by commenting upon the posted content.
				I am willing to express my opinion on this issue by commenting upon the posted content.
Non-Anonymity	3.72	1.58	0.89	
				I am not comfortable expressing my opinion on this issue on social media as the platform is not anonymous.
				Joining the discussion about the issue on social media is difficult since I could not be anonymous.
				I am worried about the lack of anonymity when discussing about this issue on social media.
Member Unfamiliarity	3.44	1.54	0.92	
				It is difficult to discuss this issue on social media since I do not know most people involved in the discussion.
				I am not comfortable discussing this issue on social media since I do not know most people involved in the discussion.
				I am not discussing this issue on social media since I am not acquainted with most people involved in the discussion.
Involvement Recognition	6.15	0.95	0.88	
				This problem (climate change) has certain consequences for me.
				This problem (climate change) has certain consequences for people close to me.
				I think this problem (climate change) affects me personally.
				I am connected with this problem (climate change) and its consequences.
Community Efficacy	3.65	1.22	0.76	
				Posting negative comments on social media would help in resolving this issue (denigration of climate change).
				Taking part in the discussion would help the social media community in solving the issue (denigration of climate change).
				The opinions and voices of the social media community about the problem can exert pressure on those responsible for the issue.
Collective Identity	3.18	1.40	0.94	
				I feel a sense of belonging whenever I join the discussion about the issue on social media.
				Participating in the discussion about this issue on social media makes me feel part of a community.
				I feel connection with others whenever I contribute to the discussion about the issue on social media.
Need to vent negative emotions	2.97	1.34	0.85	
				Expressing my anger towards this issue makes me feel relieved.

Construct	Mean	Standard deviation	Cronbach's alpha	Items
Need to take revenge	2.57	1.33	0.88	Voicing my negative opinion on this issue helps to reduce my anger. Posting negative comments on this issue helps me in venting my anger. Saying negative things allows me to take revenge on those responsible for the issue. Saying negative things is my way of giving those responsible for the issue a hard time. Posting negative things is a way for me to punish those responsible for the issue.
Moral obligation to warn others	5.15	1.06	0.70	I think it is morally acceptable to inform others of the wrongdoing of those responsible for the issue. I feel the moral obligation to inform other people about the issue. Informing others about the issue is the right thing to do.
Problem Recognition	x	x	0.91	Something needs to be done to prevent a similar issue (climate change) like this. I believe this issue (climate change) has serious societal consequences. I believe this issue (climate change) is a real problem.
Slacktivism	x	x	0.53	By liking, sharing or commenting on a post, I can help to address a social issue. Expressing agreement on social media by liking, sharing or commenting on a post is an appropriate way to display an advocacy behaviour. I would rather take a stand on a similar issue like this on social media than participate in a real-life demonstration.