Persuasion in the Wild: Communication, Technology, and Event Safety

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Abstract. Recent disasters during major events have resulted in increased focus on influencing crowds, both during emergencies and under normal circumstances. In this exploratory study event experts were interviewed to uncover good practices regarding the use of technology to communicate with crowds.

They agree that, rather than using directive means and force, crowds can best be persuaded; proving relevant information enables them to decide for themselves what course of action to take. Some of the experts remain critical about use of social media at events; effectiveness depends on target group composition, visitors' engagement in the event, and reliability. Additionally, the abundance of information visitors have at their fingertips may reduce effectiveness of information emitted by organisers. Especially important in communicating with crowds is "communicating as one", not only pertaining to explicit messages but also to non-verbal communication.

Based on these results, implications for event safety are discussed.

Keywords: crowd control, crowd management, event safety.

1 Introduction

Large events pose considerable risks to the safety of its participants, as illustrated by Pukkelpop, 2011, in Hasselt, Belgium, and the Love Parade, 2010, in Duisburg, Germany. People may get crushed or trampled during ingress and egress, emergencies may cause panic and confusion, and sports events sometimes result in misbehaviour of its spectators. Fortunately, such calamities are relatively rare. Nevertheless, ensuring that events go as planned requires extensive preparations before (crowd management) and constant monitoring and intervention during an event (crowd control).

An important element of the crowd management and crowd control toolbox is communication with visitors. Especially in the interst of safety, visitors need to know how to get to and from an event location, what they are allowed to take with them, where they can find food stalls and toilets, which places have become crowded and are closed off, what to do to prepare for extreme weather conditions, etc.

Technological developments have both facilitated and complicated communication with crowds. On the one hand, the popularity and widespread use of smart phones has prompted event organisers to make apps available, allowing visitors to inform themselves of changes in and amendments to the schedule, the festival location layout, etc.

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In addition, they may actively disseminate event-related information; using websites, Facebook, and Twitter accounts they may inform others about matters as congestion and safety issues. On the other hand, smart phones and social media enable visitors underway to or during events to look for relevant information themselves, instead of relying on what the organisers hand out to them, and communicate with and inform others.

Surprisingly, very little on communicating with event crowds is formally available in publications. The current study is a first attempt to record the knowledge of practitioners. Based on expert interviews, the current exploratory study aimed to uncover good practices about the use of technology to influence crowds at major events. These findings will be brought into accordance with insights from scientific literature, e.g. on crowd psychology. Specific attention will be devoted to the use of communication technology.

2 Theory

2.1 Mass Psychology and Communication

To many, the term “mass” to denote a large gathering of people, probably has negative connotations. Examples of mass events with disastrous consequences, such as the Love Parade and Pukkelpop, readily spring to mind. Mass behaviour has always had a reputation for being difficult to predict and control, earning crowds the epithet "mad, bad and dangerous to know" (Reicher et al. [1], p. 558). Consequently, crowds have long been regarded as irrational.

An early yet persistent view, put forward by LeBon in 1895, postulates that anonymity in crowds causes its members to lose the ability to think and reason, to decrease quality of judgement and personal responsibility, et cetera; cf. Reicher et al. [1]. In fact, this tradition views crowd behaviour as pathological and abnormal: once immersed in a crowd people give themselves to non-conscious and anti-social behaviour. According to some, this reductionist and mechanical view on crowds has legitimised repressive crowd control tactics and strategies [2].

Although the notion that anonymity decreases rationality and increases diffusion of responsibility has also been central to later theories in social psychology, such as the Deindividuation Theory [3, 4], many have come to regard this as a unnecessarily negative and little productive view on crowds and their behaviour [4, 5]. In addition, results of some studies actually contradict its central tenet that anonymity leads to anti-social and aggressive behaviour, and, rather, point in the opposite direction [6].

More recently, this view has been supplanted by the notion that crowd behaviour is normative and rational after all – or, at least, boundedly rational [7-9]. Crowd behaviour is seen as the result of a shift from individuals’ personal identity to a social identity, rather than a loss of identity altogether [1]. In essence, norms and behaviour of the relevant group supersede those of the individual. Consequently, social identity has been argued to be the key to understanding crowds and dealing with them [1], cf. [10]. Social identity determines who influences others to perform certain behaviour,

how others and their behaviour are viewed, and which behaviours are seen as normal [1, 11, 12].

This change in views on crowds corresponds to a shift in the way crowds are managed. Strategies aimed at influencing group processes have been adopted by police departments around the world and employed in settings as diverse as football matches and protesting crowds [11-16], and are argued to be suitable for handling emergency situations [17].

A more or less similar shift has emerged in the domain of risk and crisis communication. Parallel to the idea that people do not cease to be reasoning beings whenever they are immersed in crowds, research in this field has very recently started to focus on how to motivate citizens to help themselves and others prepare for or cope with extreme situations. The underlying idea is that, when faced with an emergency, the majority of citizens do not panic [18] or passively wait for whatever local governments or police instruct them to do. If given the right information, most citizens are perfectly able to decide for themselves what course of action to take before or after emergency situations [19]. Recent experiences with such situations indeed suggest there to be considerable numbers of people who are willing to assist professional emergency responders, so much so that these professionals often do not know what to do with these volunteers [20].

2.2 Social Media

Recent research has indicated that social media may play an important role in emergency situations. An analysis of the events following an outbreak of extreme weather at a Belgian music festival in 2011, for instance, show that one Twitter user was able to mobilise the nearby village of Hasselt. This resulted in inhabitants offering afflicted visitors a place to sleep, shower, food, drink, Internet access, etc. Intersetingly, some of these offering assistance appeared not to have been active on Twitter prior to these events [21]. Additionally, American research on Twitter use after disasters as the Tennessee River fly ash spillage [22], the Red River floods, and the Oklahoma grass fires [23] showed that Twitter users played an important role in spreading relevant information by re-tweeting messages from people involved in the disasters and from local media, and correcting wrong information.

That smart phones and social media offer great potential for crowd management and crowd control, for instance by proving realtime information to event visitors under normal circumstances and in case of (pending) emergencies, is acknowledged by many event organisers. Events such as Rock Werchter in Belgium, and Lowlands and North Sea Jazz Festival in the Netherlands routinely use apps to communicate lineups, programming changes, etc. They also allow broadcasting messages to warn for crowded locations, weather conditions, etc. Recently, the city of Amsterdam created an app to be used on the Queen's Day celebrations. The app showed a map of the city, indicating crowdedness and points of interest, such as First Aid stations and public transportation stations (in the end, however, the crowding indicator had to be removed to prevent a mobile network overload).

A drawback to the omnipresent smart phone in combination with access to Internet and social media platforms, is that they unlock vast amounts of information, relevant

as well as irrelevant, which may lead to overloading [e.g., 24]. An additional down side, particularly from the perspective of event organisers, may be the clutter that this causes. Specifically, the abundance of information that results from visitors actively searching for information on websites and social media, or from passive exposure to other people's contributions on social media, may well swamp the messages from organisers, which consequently lose their effectiveness.

A useful, new technique is so-called "cell broadcast" via mobile networks, in principle allowing each mobile phone in a specific area ("cell") to be reached by way of radiofrequencies, instead of text messaging or telephone frequencies, provided that these phones are suitable for receiving such signals. As such, it is impervious to overloading of these latter channels [25]. To our knowledge, however, this has not been put into practice at events.

A prerequisite of these services, however, is that their availability and necessity needs to be communicated to the public, and they will have to undertake some action in order for it to function, e.g., download an app, switch on Bluetooth, or subscribe to text message services.

3 Expert Interviews

The 16 interviewees in this project were all individuals with direct experience with crowd management and crowd control at large events. The selection was such that ten interviewees represented three different stakeholder groups involved in the organization and/or execution of five specifically selected events: they represented (commercial) organisers, municipalities, and the police organization. In addition, six experts represented more "general" experience; these came from the Dutch Police Academy, and from event safety consultancy firms. The five events were selected from a list of major Dutch events that are publicly accessible and are held each year or every two years. Several criteria were used to achieve variety in the number of visitors, location in urban or rural areas, hosted by large and small municipalities, duration, and free or paid admission. One event, the annual Queen's Day Celebration in Amsterdam, was added because during previous editions incidents occurred, such as rioting and visitors blocking railways. Table 1 presents an overview of the selected events, and the background and experience of the interview participants.

Professional code of conduct was followed while conducting these interviews. Participants were granted full anonymity and were fully informed about the research and, in particular, the topics that were addressed in the interviews, before consenting to take part. They were not in any way subjected to deception, coercion, or discomfort.

The interviews took place on location (face-to-face) or by telephone, and, on average, lasted about an hour. Each interview was recorded. As part of a more encompassing topic list, participants were, for instance, asked to list and reflect on the means of communications they had at their disposal, their use, and effectiveness, both before as well as during events. Specifically relevant to the current paper were questions about the use and effectiveness of technology, such as LED displays, Internet and social media, and smart phones. Directly after each interview, the recordings were used to

create detailed (but not literal) descriptions of the expert's remarks. These were subsequently sent to the respective participants, to allow them to inspect our rendering of the interview and make corrections when necessary. After completion of all 16 interviews, all remarks were categorized and coded, and subsequently grouped based on their specific content.

Table 1. Background and experience of the experts interviewed

	Involvement				Experience (Work years)	Events					
	Organizer	Municipality	Police	Other		1	2	3	4	5	Other
Expert 1	■				11	■					
Expert 2		■			8	■					
Expert 3			■		10	■					
Expert 4				■	data missing		■				
Expert 5		■			5		■				
Expert 6			■		>8		■				■
Expert 7			■		10			■			■
Expert 8		■			4				■		
Expert 9			■		4	■			■		
Expert 10	■				>11					■	■
Expert 11			■		4					■	
Expert 12				■	>5		■	■		■	■
Expert 13				■	>5		■	■		■	■
Expert 14			■	■	30						■
Expert 15				■	4						■
Expert 16				■	40						■

Note:
Event 1: Vierdaagsefeesten (festivities surrounding Four Day Marches, Nijmegen); 2: 3FM Serious Request, Enschede; 3: Queen's Day Celebration Amsterdam; 4: Appelpop festival; 5: Zwarte Cross festival.

In the following paragraphs those interview results pertaining to the topics at hand are presented. Quantification is done either in the text or by numbers in parentheses. These represent the number of experts who made a particular remark. As most interviewees were highly experienced professionals, with work experience sometimes stretching decennia, several remarks were considered noteworthy results even though only one interviewee mentioned them.

3.1 Treatment of the Crowd

In conformance with the state-of-the-art of crowd psychology, none of the interviewees considered irrationality to be a relevant aspect of crowd behaviour. Many of them (5) advocate treatment of visitors as mature, sensible individuals. Consequently, crowds can best be influenced not by force, but by handing them relevant information so that they can decide for themselves what course of action to take (5). This is also reflected by the tendency of the police to decrease presence of personnel at events (4), leaving communication with the crowd to an increasing extent to municipalities and event organisers (1).

3.2 Use of Technology

The means of communication with event visitors range from the conventional flyers, LED-displays to messages in local or regional newspapers, radio and TV-stations, to digital media; respondents mentioned apps (1) specifically developed for events, events pages on Facebook, Twitter accounts (3); also text alerts may be used (3). Not surprisingly, every event has its own website.

With some events communication with the crowd is inextricably linked with monitoring and signaling (4). One particular event, for instance, makes use of a camera control room, in which camera streams on different locations are continuously monitored. When crowding exceeds a certain threshold, operators will start communicating with the public using LED displays, informing them that that the particular location has become too crowded. It is then left to the individual to act as they see fit. Because the crowding threshold is set at a level at which there is no immediate safety risk, as long as the fast majority decides to abstain from moving to this location, it is not problematic if individuals should decide to ignore this information. LED display messages (such as "Location X is crowded; please go to another location") therefore form the first line of defence against crowding at this particular event. If this fails, one of a handful of standard auditory messages, recorded on a CD and delivered to stage managers on all festival locations beforehand, is selected and subsequently broadcast. When other undesirable situations (a calamity, extreme weather, etc.) threaten to happen, a signal from the police will lead to the emission of identical standard messages to the public; not just the auditory messages mentioned before, but also messages via LED displays, text-alerts, and Twitter (2). As soon as the situation is back to normal, LED display are turned off again, in order to retain their "attention value" (1); overuse of LED displays may cause important messages to go unnoticed. A similar cycle of monitoring and intervening is implemented at other events (3).

Cameras, however, are not always the only means for monitoring purposes. Personnel "on the ground" are often valuable sources of information about crowdedness and crowd states, and sometimes the one is used to back-up the other as a double check (1).

3.3 Social Media

The majority of the events focused on in this study made use of social media as means of communicating with their visitors. Facebook, Whatsapp en Ping are deemed less suitable because of their selective availability. Twitter on the other hand is openly accessible and is often used (8). One of the experts interviewed indicated that a small study conducted during the event had established that Twitter messages managed to reach some 120 000 recipients. This, however, was greatly helped by a local TV-station re-tweeting the messages, a local newspaper reporting about them, and websites taking it up (1). This incidental study indicates that the reach of Twitter messages is increased when they combine with other media (1). These other media may also allow for communication with visitor groups who cannot be reached by Twitter alone.

The use of social media at events is by no means restricted to a one-way stream of information. In addition to providing information to event visitors, messages

transmitted via social media also allow organisers to adapt to them. Not only may messages on social media be indicative of tensions in crowds, they may also make organisers aware that a part of the event location has become littered and that garbage containers and trash cans need to be emptied, for instance (2).

Despite these evident advantages, some of the experts (5) remain critical of the use of social media. First of all, events differ amongst each other in terms of the particular groups of people they attract, and even within events there may be widely varying groups of people simultaneously present. The effectiveness of social media, or of any other media for that matter, depends to no considerable extent on the composition of event crowds: social media may be effective with a relatively young crowd, whereas older people may prefer more conventional medias as TV or newspapers (2).

Second, one expert remarked that whereas social media may be effective before an event takes place, this may not necessarily be the case during events. When visiting an event, people may be busy enjoying themselves with performances and each other, or determining where they want to go next and how to get there. Thus being otherwise engaged makes it less likely that social media will be an effective means of communication, the occasional posting of pictures and clips aside (1). Other experts point to the limited reliability of telecommunication networks (5), and recommend the use of a media mix, i.e. not just social media but also more traditional means as LED displays, folders, and sound systems (1).

3.4 Communicating as One

Several interviewees stress the importance of "communicating as one" (6), to prevent spreading of contradictory information and increase message effectiveness. Communicating as one requires considerable effort. It involves not only explicit messages dissipated via many channels and with a vast array of potential senders, but it also requires bringing non-verbal communication in line (1). Several incidents involving crowd behaviour have been attributed to an incongruence in communication. For instance, one interviewee recalled an incident in the city of The Hague in the early nineties in which the police's intent, to divert the flow of a protesters, was not matched by their non-verbal communication, i.e., the presence of riot police in full combat gear (helmets, truncheons, shields, etc.). This resulted in a tumultuous course of events, including protesters clashing with riot police (1) – rather different from what was intended.

In addition, the official investigation into the so-called Project X riots in Haren (2012), a small town in the north of the Netherlands, stresses the negative effect of incongruent communication. In response to an accidental open invitation on Facebook, several thousand adolescents travelled to Haren ostensibly to celebrate a local girl's sixteenth birthday. Prior to and during this "event" local authorities and the police did their utmost to stem the flow of visitors using traditional and social media, but failed to communicate congruently and as one. Efforts focused on dissuading people to come to Haren by communicating that there would not be a party. A local government spokesperson, however, let it be known that an alternative party on one of the sports fields was under consideration. Likewise, explicit messages that visitors

would be forced to turn back did not correspond with what they experienced on-site, as alcohol prohibition was not enforced. Especially the arrival of riot police sparked heavy rioting, resulting in considerable damage to adjacent homes and gardens, and the arrest of some 108 people.

Especially pregnant in this regard is the widespread use of social media by the many parties involved in events, such as the municipality, organising committee, and police. Each realise that social media could increase their means to actively communicate with the public. With so many parties involved, however, their use of Twitter accounts further increases the risk of one party explicitly or implicitly contradicting another.

For similar reasons, event organisers are wary of the presence of police helicopters and drones (2). Visitors noticing helicopters flying overhead might well conclude that something is going on – why else would police be watching from the sky? Similarly, the use of drones may be very desirable from a crowd monitoring perspective, but may also lead to undesirable perceptions among those being monitor. Not only might they infer that something is amiss, but they might also feel their privacy is being violated – an issue very much alive in Dutch media. Such deductions might be in stark contrast with what organisers or police want to convey, which is considered to possibly result in averse crowd states and behaviours.

Not surprisingly, many interviewees strive to create unity in the messages they transmit, not only within but also across organizations, i.e. incorporating the organizing committee, municipality, police, security personnel, public transportation organizations, etc. Preferably, these message are identical, not just content wise, but also on the actual word level (1). Usually, all those involved are enthusiastic participators, and may feel the urge to send out updates from their specific points of view, putting communication congruence at risk (2). One interviewee expressed the wish to replace individual Twitter accounts by one event-specific account, but realised this would probably be met with considerable resistance.

4 Conclusions and Discussion

The current study was part of a much larger project attempting to tap into the body of practical experience of experts in the field of crowd control and crowd management. Reported here are the findings specifically pertaining to technology as a means to communicate with event visitors.

One of the general findings is that, in line with insights in crowds psychology, virtually all experts interviewed acknowledge crowds and their behaviour to be (boundedly) rational, and that influencing crowds and crowd flow should be about providing information and advice, rather than forcing them or restricting movement. Information provision, for instance that one particular location has become crowded, may occur through LED displays at strategic locations. It is then left to the individual to act appropriately. Whether this stance is a direct result of developments in crowd psychology, or that it has come about through (accumulated) experience, is a question that cannot be answered on the basis of these data.

Smart phones and social media offer great potential for crowd management and crowd control. Consequently, they are much used means to inform visitors before and during events, in addition to undiminished use of more conventional means, e.g., LED displays, sound systems, local and regional media, etc. Interestingly, social media enable a bi-directional stream of information; event organisers may use them to optimise service provision, for instance, or get a feel for the general mood.

Several drawbacks can be derived from existing literature and the interviews, however. The availability of vast amounts of information, both relevant and irrelevant, may cause overloading [e.g., 24], or may cause information from organisers to lose effectiveness. In addition, effectiveness of social media depends on the composition of event crowds, and one could also object that perhaps, during an event people pay less attention to social media. Other experts point to the limited reliability of telecommunication networks, but this would apply to all technical means of communication.

Experts attach great importance to maintaining unity in communicating with the crowd. Communicating as one and information congruency are key to persuasion effectiveness. The more means of communication are at organisers' disposal and the more parties are involved in organising an attempt, the greater the risk may be that this unity is jeopardised. In addition, it is important to note that this applies to all communication, be it in text, speech, or behaviour, verbal or non-verbal. Also the use of police helicopters or drones for monitoring purposes may well conflict with what organisers want to communicate.

With regard to social media one could argue that a complicating factors is the change in popularity of the many platforms over time. According to Dutch research [26], Facebook and Youtube are currently the largest, followed by LinkedIn and Twitter. Although the growth of Facebook is momentarily diminishing, still about 80 % of 15 to 20 year olds still use it (50 % for Twitter). Based on these data Facebook may appear to be a safe bet for events targeting this particular age group, but in fact very little is known about social media use during events. If activity is limited to posting the occasional picture of one's favourite artist, this would argue against using Facebook as a means of communication during events.

The omnipresent smart phone, in combination with access of Internet and social media, could seriously hamper organisers in their attempts to manage crowds. For instance, accidents occurring during the event may start to lead a life of their own on social media, confronting organisers with the often difficult task to bring this back to the right proportions. In addition, with meteorological information being readily available, people may draw premature conclusions about the weather, deviating from that of a dedicated meteorologist who advices the event organiser. A very relevant question therefore would be how organisers can maintain or increase persuasion effectiveness in the face of a deluge of social media contributions, so as to ensure that all those present at an event take the right precautionary action or abstain from unnecessary ones. A recent first step in answering the question how crisis communication should be designed to be able to compete with Internet messages [27] suggests that incorporating action perspectives, i.e. informing people which actions they themselves can take to counter an emergency situation, reduces people's tendency to look for additional information elsewhere.

Similarly, one of the major challenges of persuasive technology in the field of event safety is uncovering how to compete with other available information. We have already seen signs of an evolution in the use of apps, from the dedicated apps at major events, such as Rock Werchter in Belgium, to the Amsterdam Queen's Day celebration app, which was developed to communicate all kinds of information, directly or indirectly linked to safety. For instance, the app showed a map of the city, indicating crowdedness at specific locations, where to find First Aid stations, toilets, and public transportation stations. However, as some of the apps functionality had to be discontinued prematurely to prevent a mobile network overload, we still lack any insight into its full potential. An important next step would therefore be to test effectiveness of safety apps, and relatedly, how to increase their impact. In other words, research should be dedicated to studying to what extent such apps remain standing in the barrage of competing information, and how their "competitiveness" could be increased. Subsequently, it will be up to designers to transform these findings into persuasive technology that appeals to users.

The interviews on which this paper is based were not transcribed verbatim. Although great care was taken to ensure adequate renderings of the participants' opinions, this should be noted as a limitation of the study.

The current study constitutes a first attempt to uncover good practices among event safety professionals. Although 16 experts generously allowed us to take a look in their world, we feel we have only scratched the surface concerning the role technology may have in crowd persuasion - we hope this study will motivate others to add onto it.

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Appendix: Interview Topic List

During interviews, participants were asked to list and reflect on the following:

- Their interviewee's role in activities leading up to events crowd management, in particular with respect to communication with various stakeholders and/or during critical incidents
- Planning of communication as part of crowd management
- Means of communication employed as part of crowd management
- Means of communication employed as part of crowd control
- The specific roles of LED displays, social media, Internet, mobile phone, etc.
- The extent to which these are an effective means of communication before and during events