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Terrorism Communication: Characteristics and Emerging Perspectives in the Scientific Literature 2002–2011

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This paper aims to clarify current knowledge on the contribution of communication to crisis management in the case of terrorism incidents. This is done by means of a systematic review of the scientific literature on terrorism communication over the last 10 years to identify the many challenges facing communication in such crises, and represents the first attempt of its kind. To date, within the literature on terrorism communication, much attention has been paid to chemical, biological, radiological or nuclear hazards. Terrorism crises are complex and challenging. Preparedness for such diverse low-probability high-impact crises can best be included in a wider educative approach. Terrorism crises call for fast information updates that, using a multi-channel approach, can be tailored to fit different needs and (social) media habits.

1. Introduction

Although terrorism as such is not a new phenomenon (Slovic, 2002), the events of 9/11 put it on the list of top priority security concerns in the West (Mythen & Walklate, 2006) and at the same time revived scholarly interest in the topic (Schmid, 2011a). Similarly, as the Eurobarometer 75 public opinion survey conducted by the European Commission (2011) reveals, citizens are also concerned about terrorism and perceive it as one of the main problems facing the European Union. The increased worry over terrorism in general has also given rise to concern about new forms and means of terrorism (Slovic, 2002), in particular the potential terrorist use of chemical, biological, radiological or nuclear (CBRN) agents and materials (e.g., Normark, 2011). This has resulted in a number of publications, both professional and academic, on this issue (see Price, 2010). Thus, the question of what has been studied in the field of terrorism studies from a crisis communication point of view –

asserted recently to be an under-researched topic (Schmid, 2011b) – is timely.

Hence, the purpose of this study¹ is to clarify current knowledge on communication contributing to crisis management in the case of terrorism incidents. In particular, it aims at explaining what characterizes crisis communication in the case of terrorism and what CBRN aspects add to this, in order to identify its typical features and challenges. An additional aim is to find out what topics have been addressed, and to identify research trends and gaps in the literature on crisis communication in the event of terrorism. As many authors have noted that interest in crisis communication in the case of terrorism has largely developed since 9/11 (Heilbrun, Wolbransky, Shah, & Kelly, 2010), the time span covered is 10 years, 2002–2011.

Crisis communication is studied here as communication with publics that supports crisis management, following the process approach of Reynolds and Seeger (2005) concerning integrated risk and crisis communication throughout all the phases of a crisis. Crisis

communication can contribute in various ways to crisis management by public organizations. Means to this end include enhanced empowerment of stakeholder groups, increasing societal understanding of risks and fostering cooperation with response organizations. This in turn is done by monitoring stakeholder needs, implementing communication activities with citizen groups and the new media, and by supporting decision-making on joint communication strategies in the response network (Palttala & Vos, 2012).

The communication tasks that contribute to crisis management by public organizations are further explained for the various phases of a crisis in the crisis and emergency risk communication model (Reynolds & Seeger, 2005). These phases are (1) pre-crisis risk messages, warnings and preparations, (2) initial event uncertainty reduction and reassurance, (3) ongoing support of personal response, (4) resolution updates and discussions about rebuilding efforts and (5) evaluation and lessons learned. The model helps plan communication activities throughout a crisis (Veil, Reynolds, Sellnow, & Seeger, 2008; Seeger, Reynolds, & Sellnow, 2009). It was utilized as the basis of a scorecard developed for crisis communication that specifies the communication tasks of response organizations in all crisis phases, referring to communication with public groups and maintaining media relations and internal communication within the response organization and network (Palttala & Vos, 2011). Crisis communication can also strengthen community resilience on the level of family, neighbourhood and wider community networks (Kirschenbaum, 2004).

This paper consists of four sections. Following this introduction, the method, including research questions, sample, data extraction and analysis, is described. The third section presents the results on the characteristics of communication in terrorism crises, including the themes discussed in the literature on risk perception and communication in terrorism crises, along with trends and gaps in the field. Section four concludes the paper.

2. Method

This study aims at clarifying what characterizes crisis communication in the case of terrorism and what challenges it presents for communication. The study also seeks to find out what themes have been addressed, and to identify research trends, orientations and focal issues in the crisis communication literature on terrorism over the past 10 years. The research questions are as follows.

2.1. Research questions

RQ1. What characteristics of communication in terrorism crises are mentioned in the literature?

RQ2. What themes related to communication in terrorism crises are addressed in the literature?

RQ3. What trends can be seen in the literature on communication in terrorism crises?

The first research question was aimed at identifying typical features and challenges mentioned in the scientific literature, while the second research question was designed to gain more in-depth insights into the themes that have received attention in the literature. The purpose of the third research question was to identify trends and possible gaps in the literature.

2.2. Sample

The present study was conducted following the protocol of a systematic literature review (e.g., Jesson, Matheson, & Lacey, 2011). The search was conducted in multiple databases via EBSCOhost, ProQuest and Web of Science in February 2012. The search terms used included [terrorism] and [crisis communication or risk communication or emergency communication]. The selection of optimal search terms was a result of several tryouts. The terms CBRN, weapons of mass destruction, dual-use weapons, non-conventional weapons, chemical weapons, biological weapons, radiological weapons or nuclear weapons instead of or combined with terrorism did not add to the results in the selected databases and were, therefore, not used.

The search fields covered abstracts, titles and keywords. Moreover, the search was limited to scientific articles in peer-reviewed journals. Other document types, such as book reviews, opinion pieces and commentaries, were excluded. In addition, the availability of the full article in the databases of Jyväskylä University Library or on the Internet was a prerequisite. Table 1 clarifies the process.

In the first step, the abstract, title and keywords of all the results from the different databases, 435 articles altogether (see Table 1) were checked to assess their potential for the study. If needed, the introduction and/or conclusions were also read. After this initial scan, articles considered to be adequate in scope were exported to RefWorks, a system for managing references.

This resulted in a total of 193 articles that were then read through more thoroughly and from which, on the basis of the inclusion/exclusion criteria, a further selection was made. The inclusion criteria were perspective on communication, defined as crisis communication with the public, among and within response organizations; focus on terrorism; English language; scientific quality (minimum of eight scientific sources as a rule of thumb); and year of publication 2002–2011. Excluded articles, such as articles dealing with internal communi-

Table 1. Search Results per Database (*Number Includes Some Duplicates)

Keywords	Database	First results	After initial scanning	After applying criteria	Final sample coded
[terrorism] and [crisis communication or risk communication or emergency communication]	EBSCOhost	103 (13.2.2012)	57	31	24
	Web of Science	116 (16.2.2012)	62	25	19
	ProQuest	216 (21.2.2012)	74	25	20
	Total	435*	193	81	63

ation in the case of corporate crises and articles based on content analysis of news coverage were kept on record, as the focus was on communication with the public by response organizations. After applying the inclusion/exclusion criteria, the final sample for the literature review consisted of 81 articles.

2.3. Data extraction and analysis

The 81 articles in the final sample were read through and relevant data written down with the help of a predesigned data extraction sheet (Jesson et al., 2011). Categories in the data extraction sheet included title, informal summary, focus, threat, topic area, aim of research, method, terrorism communication and CBRN terrorism communication. While coding the data, some articles were further excluded, resulting in a final total 63 articles in the table.

The analysis was conducted using thematic analysis. Thematic analysis is a common approach used for analyzing qualitative data (e.g., Schwandt, 2007). In this approach, the analyst codes sections of text based on whether they contribute to emerging themes (Schwandt, 2007). In addition to identifying emerging trends in the literature, some simple quantitative analyses were conducted, covering, for example, the distribution of articles according to year of publication and crisis type. The unit of analysis was one article. At this stage, only data that were relevant to answering the previously outlined three research questions were analyzed, that is, characteristics of and themes related to communication in terrorism crises as well as trends found in the literature. These are reported next.

As among the 63 articles on terrorism, 34 or more than half focused on CBRN terrorism, we analyzed these articles separately, to be able to report CBRN-related aspects of these crises that have relevance for communication. CBRN substances can cause great harm and contamination, complicating, for example, hospital treatment (Scanlon, 2010; Covello, Peters, Wojtecki, & Hyde, 2001). An example of CBRN terrorism was the nerve gas sarin released in 1994 in Matsumoto, and in 1995 in the Tokyo subway (Okumura, Suzuki, Fukada, Kohama, Takasu, Ishimatsu & Hinohara, 1998a and 1998b). The

communication aspects of CBRN terrorism crises gained attention during the period investigated here.

3. Results

Here, we discuss the main topics addressed in the literature related to communication in the case of terrorism crises. The analysis of the scientific literature concentrated on the following perspectives:

- Characteristics of communication in terrorism crises mentioned in the literature.
- Themes discussed in the literature on risk perception and communication in terrorism crises.
- Trends and gaps in the literature on communication in terrorism crises.

First, we report the typical features and challenges of communication mentioned in the scientific literature on *terrorism crises*. Second, we focus more specifically on the insights found in the literature on points of attention for *communication* with various public groups and *risk perception*, as an understanding of risk perception by public groups is a precondition for initiating effective communication. Finally, we discuss *trends and gaps* in the literature on communication in terrorism crises. Since a large proportion of the articles focused on CBRN terrorism crises, we brought the CBRN-related aspects together in a separate section to see what challenges these add for communication.

3.1. Characteristics of communication in terrorism crises mentioned in the literature (RQ1)

Below, the various themes present in the literature are reported. We first report on the themes clarifying the challenges for communication in the case of terrorism. Second, CBRN-related aspects are explained. Thus, both terrorism- and CBRN-related aspects are considered.

3.1.1. Terrorism-related aspects

In the articles, many different terrorism-related aspects of crises are mentioned that illuminate the complexity

of crisis situations of this kind. These concern the emotions evoked, the need for sense-making, unexpected behaviour, trust and credibility, and the discourse on terrorism.

3.1.1.1. Emotions evoked

Terrorism risk is seen as uncontrollable (Sheppard, 2011), which may add to the level of fear experienced, as risks that are perceived as 'low control' are related to worrying (Lee, Lemyre, & Krewski, 2010). There are concerns that repeated sensationalist reports increase emotions, for example, in cases of bioterrorism (Aldoory & van Dyke, 2006). Terrorists seek to cause terror, while society attempts to reduce dread of terrorism (Sheppard, 2011).

3.1.1.2. The need for sense-making

Terrorism implies intentionality, vulnerability and psychological impact (Goldstein, 2005). It also includes a threat of further terrorist activity (Gibbs van Brunschot & Sherley, 2005). Therefore, it creates more fear and anxiety than a naturally occurring crisis with similar consequences (King, 2005). Fear in itself is a health risk (Gray & Ropeik, 2002), as it may lead to a variety of stress-related illnesses (Hyams, Murphy, & Wessely, 2002).

During and after crises, people may experience changes in the way they view the world or themselves (Rubin, Amlôt, Page, & Wessely, 2008). A study analyzing 9/11 from a communication perspective suggested that leaders in the public sector can facilitate sense-making and address a wider audience that may also be susceptible to traumatization by the events (Griffin-Padgett & Allison, 2010). This includes addressing core values in society (Ulmer & Sellnow, 2002; Griffin-Padgett & Allison, 2010). For example, a leader's focus on threats to values rather than the terrorist act itself may convey that what we are struggling with is a state of mind and with maintaining adherence to basic values that are important for all (Gibbs van Brunschot & Sherley, 2005).

Stressful times call for support to be given to relationships or social groups, and emotionally supportive communication may provide an antidote to the stress provoked by terrorism (MacGeorge, Samter, Feng, Gillihan & Graves, 2007). As mentioned by Palenchar, Heath, and Orberton (2005, p. 65) in a study on terrorism and industrial chemical production, 'A resilient community can live with rather than in fear'.

3.1.1.3. Unexpected behaviour

Fear and misperceptions may lead people to place themselves in greater danger than that posed by the original incident itself (Rubin et al., 2008, following Gray

& Ropeik, 2002). There are large gaps between advised and real behaviour in the case of terrorism threats (Rogers, Amlôt, Rubin, Wessely, & Krieger, 2007). An evaluation of existing case studies showed that, the notion of a panic-prone public can be considered a myth, although behaviour can be different than expected, while behavioural responses contrary to advice may include acts of omission (e.g., travelling, but perhaps at higher statistical risk) and of commission (e.g., taking medication, but possibly not at the right moment; Sheppard, Rubin, Wardman, & Wessely, 2006).

3.1.1.4. Trust and credibility

A study conducted in New York City, 2 years after the 9/11 attacks, showed that low education can be considered a risk factor for high terrorism risk perception and fear (Boscarino, Adams, Figley, Galea, & Foa, 2006), a finding that was confirmed in a study on terrorism threats in Australia (Stevens, Agho, Taylor, Barr, Raphael, & Jorm, 2009). Furthermore, during the anthrax crisis in 2001, disparities in treatment on the basis of race or social class and among minority groups were suspected (Blanchard, Haywood, Stein, & Tanielian, 2005). This calls both for ethical decisions and for tailored information disseminated with sincerity by credible sources, such as suggested in a study on a bioterrorist threat and trust in public health institutes among the African American population (Meredith, Eisenman, Rhodes, Ryan, & Long, 2007). Maintaining credibility is a challenge, as controversial issues such as eligibility for health care and financial compensation are involved (Hyams et al., 2002). In a study on terrorism related to industrial chemical production, it was concluded that terrorism crises need open yet cautious discourse, as it is also important that information should not fall into the wrong hands and add to the crisis (Palenchar et al., 2005).

3.1.1.5. Discourse on terrorism

Labelling an act as terrorism in crisis management often leads to upscaling to a higher level of responsibility, while it may also affect the perceptions of public groups. Unfortunately, fear is seen by some as political capital, and a politicization of terrorism occurs, in which risk rumours may easily attach to a rolling narrative that gains cultural momentum (Mythen & Walklate, 2006). Political cause construction has also been noted, as in a study on the strategic communications of the Bush administration (Lockett, Domke, Coe & Graham, 2007).

The literature offers a variety of definitions of terrorism. For example, school violence may be mentioned as an act of terrorism by some (Veil & Mitchell, 2010), while for others terrorism is defined in terms of political group violence expressed by terrorist actions

(Gofin, 2005). Initial evidence from a study on school shootings indicated that in communication about school violence, it may be wise to avoid widening the gap between conflicting world views (Veil & Mitchell, 2010). Hence, campus safety campaigns need the right balance of warning and tolerance messages, while mitigating attacks on alternative world views and preventing aggression towards differing others (Veil & Mitchell, 2010). The same point is made in an Australian study (Stevens et al., 2009): communication campaigns about terrorism have to be framed with caution in order to avoid negative reactions towards minorities.

3.1.2. CBRN-related aspects

In the literature, the CBRN-related challenges emphasized are the diversity of crises, uncertainty and the quickly evolving nature of information, lack of clear boundaries of time and geographical space, lack of knowledge and the diverse needs of different public groups.

3.1.2.1. Diversity of crises

The topics placed under this heading include the kinds of hazardous materials involved, lethality, area size and the duration of contamination (e.g., Sheppard, 2011). It is clearly challenging to arrange preparedness for such a great diversity of situations.

3.1.2.2. Uncertainty and quickly evolving information

A terrorism crisis involving CBRN materials is often not observable and has delayed effects (Sheppard, 2011). The detection of the substances in question may also take time (Clements-Nolle, Ballard-Reisch, Todd, & Jenkins, 2005). Consequently, scientific uncertainty results in delays in information release, as was shown in an interview study of the anthrax crisis in 2001 (Robinson & Newstetter, 2003), and causes ambiguity in the advice provided initially (Sheppard, 2011). During such a crisis, as in the London polonium crisis in 2006, insights evolve and call for constant updates in the information provided to stakeholders (Rubin, Amlôt, & Page, 2011). These uncertainties add to the fear of the unknown experienced by public groups (Sheppard et al., 2006). A study is discussed in which expert-interviewees explained that a bioterrorist threat was likely a hoax, while at the same time responding as if the danger was genuine (Sellnow, Littlefield, Vidoloff, & Webb, 2009).

3.1.2.3. No clear boundaries of time and geographical space

Terrorism crises caused by hazardous CBRN materials often do not have very clear boundaries in time and

space. As mentioned in the previous paragraph, the beginning often resembles a creeping crisis. Next, there may not be a specific end to the situation (Goldstein, 2005), as the consequences may be felt for a long time. Furthermore, there is no clear zone of danger, making it difficult to see who is safe and who is not, so that, for example, rescuers do not know for sure that their own families are safe (DiGiovanni, 2003).

3.1.2.4. Lack of knowledge among public groups

An American study showed that people's understanding of CBRN threats is limited (Wray, Becker, Henderson, Glik, Jupka, Middleton, Henderson, Drury, & Mitchell, 2008). This makes it challenging to communicate technical information to citizens in a short period of time (Rubin et al., 2008). A study on public health preparedness in Nevada showed that the lack of health literacy calls for simplification of technically difficult content (Clements-Nolle et al., 2005).

3.1.2.5. Diverse needs of public groups

The needs of public groups vary greatly, as groups are at different levels of risks (Wray et al., 2008). Detailed information on the risks of having been exposed to hazardous substances is needed, as, for example, in the London polonium incident in 2006 (Rubin et al., 2011). Along with exposure-specific messages, context-specific messages are also required (Corman & Fischhoff, 2008). Persons who are directly affected by the crisis need detailed instructions, for example, to be able to conduct self-triage to establish if they have been exposed (Sheppard, 2011) or to evacuate more rapidly, as in the case of the attack on the World Trade Center (WTC) buildings in 2001 (Zimmerman & Sherman, 2011). Another study on this crisis showed that barriers to evacuation need to be explicitly addressed (Gershon, Qureshi, Rubin, & Raveis, 2007). Fear may also spread to non-exposed populations (Rogers et al., 2007), and hence their concerns also need to be answered. It is important to reassure those who are not exposed of their safety and, while preventing further harm, for example, by transmission of an infectious disease, also to mitigate the social effects of the crisis (Wray, Kreuter, Jacobson, Clements, & Evans, 2004).

3.2. Themes discussed in the literature on communication in terrorism crises (RQ2)

Several themes related to communication in terrorism crises receive attention in the literature. Insights on both risk perception and communication are reported below. First, we report themes (discussed) on *risk perception*, as an understanding of risk perception by public

groups is a precondition for initiating effective communication. Second, we report themes discussed on communication.

3.2.1. Risk perception

Many aspects of risk perception are discussed in the literature. Here, we report the following: mapping risk perceptions, factors influencing risk perception and misperceptions.

3.2.1.1. Mapping risk perceptions

Risk perceptions can be mapped according to the degree of dread they create and the degree to which they are known or unknown (Sheppard, 2011). Perception of risk is also influenced by threat type, as perceptions of risk between a natural disaster, a violent crime and an act of terrorism have been found to differ (Heilbrun et al., 2010). As a low-chance phenomenon, terrorism is acknowledged for its potential to create anxiety among publics (Lee et al., 2010). The type of terrorist scenario also plays a role (Lee, Dallaire, & Lemyre, 2009). For example, one study tested a threat appraisal model for terror alerts (Pang, Jin, & Cameron, 2006). CBRN hazards are perceived both as dreadful and unknown (Sheppard, 2011). Assessing risk perceptions after an attack may be methodologically challenging due to rapid changes in perceptions (Rubin et al., 2008).

3.2.1.2. Factors influencing risk perception

Risk perception is influenced by many factors. Threat, uncertainty and control are seen as cognitive dimensions which influence an individual's response to terrorism (Lee et al., 2009). While uncertainty and uncontrollability score high in terrorism, perceptions also further influence psychological reactions, such as fear and worry about family health (e.g., Lee et al., 2010).

In addition, socio-demographic, socio-economic and psychosocial factors are important aspects that shape risk perception. For example, education level, migrant background or ethnicity, gender, age, negative previous life events, post-traumatic stress disorder and fear of death have been found to influence risk perception (Boscarino et al., 2006; Kearon, Mythen, & Walklate, 2007; Stevens et al., 2009).

Moreover, cultural knowledge influences risk perception. Cultural factors are also often intertwined with the context in which the risk is perceived. For example, the timing of the event, regulation by authorities and other social and political processes may play a role, as has been shown by studies of terrorism risk perceptions and individuals' response to terrorism (Lee et al., 2009). In the case of the London polonium incident in

2006, popular culture and the fact that the James Bond movie *Casino Royale* had opened in the cinemas just before the event may have affected risk perceptions (Rubin et al., 2011). A preference for one source over another may also differ across cultures. In the case of the London polonium incident in 2006, communication conducted by health care professionals, a trusted source in the United Kingdom, may have mitigated people's perceptions and reactions (Rubin et al., 2011). A study conducted among Canadians suggests that control over terrorism is considered the responsibility of institutions (Lee et al., 2010), as individuals feel helpless to do anything themselves.

3.2.1.3. Misperceptions

A challenge presented by CBRN terrorism concerns misperceptions, which may further add to public fear levels (Rubin et al., 2008) and spur circulation of rumours (Mythen & Walklate, 2006). As people normally do not have first-hand experience of terrorism, they may rely on others, including the news media, for interpretation of the risks involved (Aldoory, Kim, & Tindall, 2010). Prevailing misperceptions among the public groups should be addressed in communication activities. Understanding the risk perceptions of public groups in CBRN terrorism crises is important in order to craft communications that meet the needs of target audiences (Wray et al., 2004).

3.2.2. Communication in terrorism crises

We now turn to a discussion of themes related to communication found in the literature: the role of communication, communication approaches, leadership communication and rhetoric, communication as a support function, communication planning, information needs and trust, targeting communication, messages and communication means, and ethics.

3.2.2.1. The role of communication

In a study on nuclear/radiological terrorism situations, the role of communication was described as helping people take appropriate self-protection measures, limit adverse social and psychological effects, maintain trust and confidence, and reduce morbidity and mortality (Becker, 2004). Although we have already mentioned that the notion of the public as panic-prone public is to be considered a myth (Sheppard et al., 2006), it is suggested that communication can help to keep people's fears in perspective (Gray & Ropeik, 2002).

According to Fischhoff (2011), while the direct effects of terrorism depend on operational crisis management, the indirect effects, for example, whether terrorists manage to spread fear, anxiety, uncertainty and

distrust, depend on the success of communication. Insights on how this may be done are presented below.

3.2.2.2. Communication approaches

According to the literature, communication can adopt two rhetorical stances: a persuasive approach aiming at inducing certain behaviours, such as evacuating, or a non-persuasive approach aiming at facilitating informed decision-making, for example, explaining how to best prepare for a radiological/nuclear attack (Fischhoff, 2011). Moreover, in reference to the 9/11 tragedy in 2001, it is suggested that discourse that emphasizes renewal and growth based upon stakeholder commitment or a re-establishment of core values may be an appropriate strategy (Ulmer & Sellnow, 2002).

A contingent approach to communication strategies is proposed for cases of terrorism by a model linking the appraisal of threats with communication where threat level, duration and type play a central role (Pang et al., 2006). By reducing dread and unknown risks, risk communication strategies may aim at augmenting resilience (Sheppard, 2011).

Speaking with multiple voices in comparison to 'speaking with one voice' may be the most appropriate strategy for risk communication, where heterogeneity of the target groups is combined with high technical uncertainty about the issue being communicated, as suggested by a case study following the anthrax attacks in 2001 and an analysis of the literature (Clarke, Chess, Holmes, & O'Neill, 2006). Finally, due to the indirect and long-term effects of CBRN events, a comprehensive strategy covering not only emergency response, but also long-term health care, risk communication, research and economic assistance, is proposed (Hyams et al., 2002).

3.2.2.3. Leadership communication and rhetoric

A study of leadership communication after the 9/11 attacks in 2001 suggests, confirming the restorative rhetoric approach, that a leader can serve as a facilitator in guiding the process of healing towards restoration, as this helps to restore faith in a core set of values and beliefs, facilitate the healing of direct victims and wider audiences, recreate a sense of security, and establish a vision for the future (Griffin-Padgett & Allison, 2010). Several authors analyzed President Bush's public communication and crisis rhetoric related to the terrorist attacks of 9/11, covering topics such as successes and difficulties in the war on terror (Smith, 2005), themes and sequences of discourse and communication strategy (Lockett et al., 2007), presidential communication and charismatic leadership (Bligh, Kohles, & Meindl, 2004), and public discourse and national identity (Drew, 2004).

3.2.2.4. Communication as a support function

In addition to its more strategic role, the literature describes how communication also serves as a support function. In the case of evacuation, for example, the WTC buildings in 2001, communicating the risk communication plan to employees before the event can ease evacuation (Gershon et al., 2007), while immediate communication is needed to start the evacuation and enable other services, such as the transportation system, to function smoothly (Zimmerman & Sherman, 2011). Moreover, in crises caused by biological weapons, communication is considered an important component of hospital preparedness (Ippolito, Puro, & Heptonstall, 2006) and, when improved, could also enhance the efficiency and safety of the emergency medical service response (Beaton, Stergachis, Oberle, Bridges, Nemuth, & Thomas, 2005). In fact, communication can serve as both a facilitator and barrier to the smooth operating of other functions in emergencies (Gershon et al., 2007).

3.2.2.5. Communication planning

CBRN terrorism preparedness planning should include anticipating and preparing for a range of psychological factors associated with various incidents (DiGiovanni, 2003). Moreover, the human factor, the kind of substances involved, the socio-cultural environment and the physical environment should be taken into account throughout the pre-event, event and post-event phases (Gofin, 2005). The community should also be involved in the planning activities (Blanchard et al., 2005). CBRN incidents may have long-lasting effects, thus, recovery poses special challenges for communication, as people need to know, for example, if it is safe to return to contaminated areas (Sheppard, 2011).

According to the literature, among the communication staff needed for terrorism risk communication are subject matter specialists, risk and decision analysts, and communication specialists and managers (Fischhoff, 2011). Pre-event education and training is suggested for both citizens and professionals. A study in Nevada showed that while citizen groups need personally relevant information regarding, for example, signs and symptoms of infection, professional groups need training in potential non-traditional roles that they may need to assume in the event of a bioterrorism crisis (Clements-Nolle et al., 2005). Uddin, Barnett, Parker, Links, and Alexander (2008) describe an emergency preparedness curriculum that also covers the topic of risk communication and risk perception in relation to CBRN.

3.2.2.6. Lack of coordination

Terrorism and, in particular, CBRN terrorism crises involve many different response organizations, making

collaboration even more crucial. Several authors suggest improving coordination in the response network, as this is often hampered by, for example, organizational, legal and professional constraints, such as lack of resources, differences in role perceptions (Lowrey, Evans, Gower, Robinson, Ginter, McCormick, & Abdolrasulnia, 2007), interpretations of scientific or medical information (Chess & Clarke, 2007), different priorities (Hyams et al., 2002), hierarchical structures (Alavosius, Houmanfar, & Rodriquez, 2005), power differentials and cultural clashes (Beaton et al., 2005), ineffective communication between journalists and public information officers (Lowrey et al., 2007), and interorganizational conflicts (Chess & Clarke, 2007). Problems can also arise where the organizations involved in the response network are not accustomed to working together (Hyams et al., 2002). Solutions offered by the literature include different organizing models (Alavosius et al., 2005), organizational, professional and informal networks to facilitate communication by response organizations. For example, a bioterrorism taskforce was utilised in the anthrax crisis in 2001 (Chess & Clarke, 2007), and cooperation was arranged to improve journalistic practices, as mentioned in case studies such as the Madrid train bombings in 2004 (Sorribes Pont & Rovira Cortiñas, 2011).

3.2.2.7. Information needs and trust

The information needs of the public in the case of a bioterrorism crisis include – as in other crises generally – honest, accurate and timely communication (Clements-Nolle et al., 2005). In addition, focus group studies on radiological/nuclear situations showed that the primary concerns tend to centre on health issues, self-protection and the protection of family members (Becker, 2004). Similar results emphasizing personal health issues are mentioned in other studies (e.g., Wray et al., 2008). Moreover, people would like to have specific information about the dangerous substances involved (Becker, 2004). Detailed information is appreciated on one's risk to exposure, test results and the differences between acute and chronic effects of exposure (Rubin et al., 2011), as is evacuation information for those at continued risk (Wray et al., 2004).

Consistency of information across different sources is also appreciated (Clements-Nolle et al., 2005). Attempts to provide non-specific reassurance may provoke suspicion (Rubin et al., 2011). Furthermore, the uncertain nature of information related to CBRN terrorism crises may lead people to suspect miscommunication. For example, in the case of the anthrax crisis in 2001, health messages might have been interpreted as inconsistent and unreliable had the rationale for changing information not been explained (Blanchard et al., 2005). Consequently, communicators should ensure

that changing information and advice is not interpreted as mishandling of the situation by authorities (Sheppard, 2011).

The provision of accurate and consistent information has also been identified as a component of trust (Blanchard et al., 2005; Palenchar et al., 2005; Meredith et al., 2007). Other aspects of communication to be considered in relation to trust include the use of credible and trusted sources and spokespersons, having local officials demonstrate sincerity in helping people, providing people with all the relevant information available, and involving people in the communication process (Blanchard et al., 2005; Meredith et al., 2007). This is relevant in all kinds of crisis, but it is especially crucial in CBRN terrorism incidents as these create even more uncertainties. One aim of communication before, during and after terrorist attacks, as proposed in the literature, is to maintain and build trust (Rogers et al., 2007), as it is this that terrorism seeks to shatter.

3.2.2.8. Targeting communication

In terrorism crises, emphasis is laid on the importance of identifying risk groups (Stevens et al., 2009) at different risk levels (Wray et al., 2008) to be able to develop group-specific risk communication strategies (Stevens et al., 2009) and segment, for example, consumer groups in the case of food terrorism (Degeneffe, Kinsey, Stinson, & Ghosh, 2009). Risk groups include professionals exposed to the event, vulnerable populations (e.g., homeless and poorly housed people, children, immigrant communities, people with physical limitations, such as a hearing defect) and transient populations (e.g., individuals away from their normal surroundings; Blanchard et al., 2005; Casman & Fischhoff, 2008).

A questionnaire-based study into public perceptions of emergency advice, including CBRN terrorism crises, confirmed that communication should – as in other types of crisis – be tailored to meet the needs of particular stakeholder groups and different communities (Kearon et al., 2007). Educational materials on, for example, bioterrorism should suit the needs of different public groups (Clements-Nolle et al., 2005). Furthermore, stakeholder groups differ, for example, in preferences for or use of media, as shown in an American study (Wray et al., 2008). There are also a number of communication issues that particularly concern minority groups, including potentially higher levels of distrust and fatalism (Blanchard et al., 2005; Wray et al., 2008), and which thus call for relationship building with different groups before crises occur (Blanchard et al., 2005). This is considered even more important in the case of a terrorism threat that may evoke strong emotions. Public groups may also be formed around issues presented in the media during a terrorism crisis. A study showed that news coverage of bioterrorist activity may,

for example, generate hot issue publics and active publics, by increasing problem recognition, perceptions of severity and emotional responses, such as fear and anxiety (Aldoory & van Dyke, 2006).

3.2.2.9. Messages and communication means

In the case of CBRN terrorism-related instructions, the messages designed for diverse publics should emphasize simple, practical steps and basic information (Wray et al., 2008), be straightforward, use easy language, employ pictures, and be available in multiple languages (Becker, 2004). Studies have shown that some terms, such as 'shelter-in-place', used in current radiological/nuclear terrorism emergency information materials may be confusing or unclear for some people (Becker, 2004). This stresses the importance of health literacy and the simplification of complex materials (Clements-Nolle et al., 2005). Furthermore, there is discussion on how the distinctive features of various hazardous CBRN materials could be taken into account in message strategies (Wray et al., 2004). A method for assisting in the construction of exposure-specific messages and answering context-specific questions in the case of a plague bio-attack has been developed (Casman & Fischhoff, 2008).

With regard to communication means, the use of multiple channels is advocated (Clements-Nolle et al., 2005). In a multi-platform strategy, for example, tweets can link to websites with more information. The suitability of various media in crisis situations is discussed by many authors (e.g., Becker, 2004; Kearon et al., 2007; Jefferson, 2006; Lee & Rao, 2007).

3.2.2.10. Ethics

CBRN risks and, for example, the ethically complex dimensions of disease containment, call for accurate information and in cases where information is shared between different organizations, questions about confidentiality and anonymity also arise (King, 2005).

Questions and concerns about ethics are relevant also to governmental communications on terrorism where the discourse about terrorism, according to the literature, is brought into political debates and sometimes used for political ends (Mythen & Walklate, 2006). Moreover, when a nation is threatened, nationalist sentiments come into play, as was shown in a content analysis of communication following the 9/11 crisis in 2001 (Hutcheson, Domke, Billeaudeau, & Garland, 2004). Terrorism may also be seen to undermine trust in the government and pose a threat to core values (Gibbs van Brunschot & Sherley, 2005). Terrorism is a criminal offence with risk of repetition, and thus linked with security issues. Underlying security concerns often dictate what information can be communicated to the public, and consequently there is a risk of security issues being leaked (Mythen & Walklate, 2006).

It is also pointed out that as the success of terrorism may be measured in terms of publicity and fear created among the public as much as in numbers of casualties, overstating the risk in public communication may turn against itself (King, 2005). Moreover, it is suggested that issues of ethics and responsibility should be addressed in crisis management planning and preparedness communication by organizations (Ulmer & Sellnow, 2002; Wray et al., 2004). All of this adds to the complexity of communication concerning CBRN terrorism threats.

3.3. Trends and gaps in the field (RQ3)

Next, trends in the literature on communication in terrorism crises are discussed.

3.3.1. Years of publication

The final sample consisted of 63 articles covering 10 years, 2002–2011. The highest number of articles was found in 2007 (12), followed by 2005 (11) and 2006 and 2011 (8 each). Hence, a peak in publication shows in the years 2005–2007. This could be explained by the high number of articles on bioterrorism (9), either focused on or inspired by the anthrax attacks of 2001. Moreover, a relatively large number of the articles published during those years address the terrorist attacks of 9/11 (8).

Division of the study period into two 5-year-periods, 2002–2006 and 2007–2011, shows a slight rise in the number of articles in the latter period: 34 in 2007–2011 vs. 29 in 2002–2006.

3.3.2. Crisis types

Throughout the 10-year review period, various types of crises, risks and threats were studied and addressed that relate to communication. The attention devoted to CBRN terrorism in the literature was high over this period, and in the second half of the time span covered, the number of CBRN-focused articles was somewhat higher (20) than in the first half (14). The number of terrorism-focused articles, on the contrary, was almost the same in the two periods (14 vs. 15).

Within the general terrorism category, almost half of the articles (14) dealt with the attacks of 9/11. Moreover, many of the remaining general terrorism-focused articles used these attacks as a point of reference. The attacks of 9/11, not surprisingly, were also the single terrorism event that received most attention in the literature. In fact, many authors noted that scientific interest in terrorism and, more specifically, terrorism risk communication increased after the attacks of 9/11 (e.g., Heilbrun et al., 2010).

Within the CBRN terrorism category, the crisis type that received most attention in the literature was biological terrorism ($n = 17$). Following the anthrax crisis in

2001, anthrax attacks were the most studied event ($n = 4$), also serving as starting point for a number of other bioterrorism-focused articles. In fact, the number of articles on bioterrorism began to increase from 2005 onwards. In addition to the anthrax attacks after 9/11, other cases analyzed were a hypothetical attack on food supplies and a bioterrorist hoax. Least attention in the category of CBRN terrorism-related articles was paid to terrorism crises related to chemical substances ($n = 2$). One such article reflected on the sarin gas attacks in the Tokyo subways in 1995 (Beaton et al., 2005). Interest in radiological/nuclear terrorism crises, on the other hand, seems to have grown recently, as half of the radiological/nuclear articles (6) were published in 2011, the same year as the disaster in Fukushima.

3.3.3. Methodological approach

The majority of the articles (38) were based on empirical data while the rest (25) were classified as non-empirical. A higher number of empirical articles were found among the general terrorism-focused articles (21 of 29) compared to CBRN-focused articles (17 of 34). Empirical data appeared least in articles dealing with the whole range of CBRN terrorism crises as a group (2 out of 9). More empirical articles appeared in 2007–2011 (24) than in 2001–2006 (14).

The methodological approach of the empirical articles was qualitative (21), although a substantial number of articles (14) followed a quantitative approach, while only a few ($n = 3$) adopted a mixed-method approach using both qualitative and quantitative methods. The most common qualitative methods used were interviews and focus groups, and the most frequently used quantitative methods were surveys and content analysis. The non-empirical articles consisted of a diversity of article types. No previous systematic literature reviews were found.

3.3.4. Journals and authors

The 63 articles in the final sample were published in 52 different journals representing many different disciplines, indicating the multidisciplinary nature of the topic. The most recurrent groups of journals were health and medicine, communication and psychology. Nine journals appeared on more than one occasion in the final sample, and the highest number of articles from the same journal was three. There were two journals in this category: *Health Physics* and the *American Journal of Public Health*.

Moreover, the list of authors was wide. Sixteen of them were involved in more than one article. The most frequently appearing authors were G. James Rubin (5), Simon Wessely (5), Steven M. Becker (4), Richard Amlôt (3) and Lisa Page (3). All in all, the topic seems to have

a broad scholarly foundation with an as yet not fully developed core of journals and authors.

4. Conclusions

Although this literature review did not capture all the insights present in the literature in full detail, it offers a broad overview of the scientific publications on the topic during the last 10 years. It reveals the many challenges presented by terrorism crises, in particular those concerning risk perception and communication, and some of the current research trends in the field. Below, we summarize the findings.

4.1. Characteristics of communication in terrorism crises

According to the literature, terrorism crises are complex and challenging. They are low probability but high-risk incidents. Terrorism is an intentional act, possibly leading to mass casualties with risk of repetition. CBRN terrorism crises are even more complex, as they may involve a wide array of hazardous materials, causing contamination and in some cases infectious diseases. They often have no clear boundaries in time and no clear zones of danger and safety.

For crisis management, the wide and evolving array of hazardous materials makes it difficult to create preparedness, while mitigation calls for cooperation between multiple response organizations and different kinds of specialists. CBRN crises may be difficult to identify at an early stage and can have long consequences. They may call for large-scale response and high capacity on the part of the various organizations involved, including hospitals.

4.2. Themes related to communication in terrorism crises addressed in the literature

According to the literature, risk perception in the case of terrorism can be mapped according to the level of dread and knowledge in society. Risk perceptions may be influenced by many factors, such as uncertainty and uncontrollability, and differences in cultural knowledge and levels of trust in institutions. The perceptions and misperceptions of public groups should be taken into account when drafting communication activities.

The literature shows that the role of communication is clearly broader than just issuing instructions to public groups. Various approaches can be used to enhance resilience. It is important that leaders show empathy and facilitate sense-making. Communication can support crisis response processes, for example, by addressing evacuation guidelines. The literature mentions the importance of the thorough planning of com-

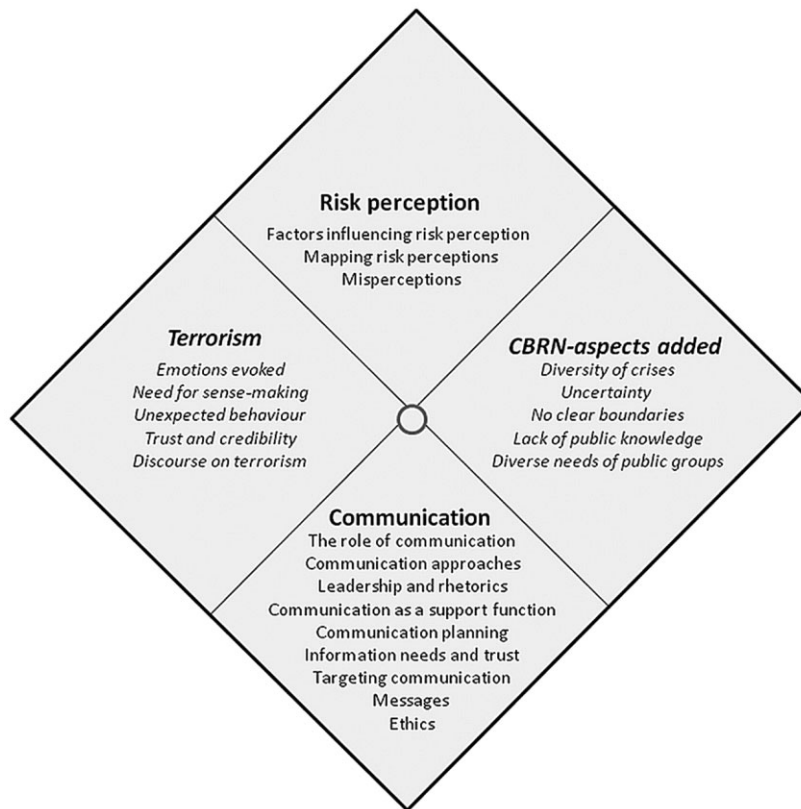


Figure 1. Overview of the main themes found in the literature.

munication, including the various competences needed, and coordination of the response network. Diverse information needs have to be addressed and ways found to target communication to the right audiences. For example, exposure- and context-specific messages can be disseminated using a multi-channel approach. Ethical aspects are also mentioned. Figure 1 summarizes the main characteristics and themes found in the literature.

4.3. Trends in the literature on communication concerning terrorism crises

The literature shows that the topic belongs to a multi-disciplinary field addressed by a variety of authors in a variety of journals, although relatively little attention has been paid to the topic in communication journals. The current variety and breadth of scope also indicate a field of study with a not yet fully developed scientific core. The attacks on 9/11 have spurred the publication of a number of articles on terrorism in general, while the anthrax attacks in 2001 led to articles on bioterrorism. In fact, the literature shows an increasing interest in communication in CBRN terrorism crises, in particular over the past 5 years. The literature on communication in cases of terrorism involving the use of chemical substances, on the contrary, is still in its infancy while

interest in radiological/nuclear terrorism-related crises seems to have grown recently. In sum, the results show an increasing number of articles based on empirical research. However, empirical evidence supporting the examination of the whole range of CBRN terrorism crisis events combined is lacking.

4.4. Implications for practice and research

The study shows that in terrorism crises many general insights on crisis communication are applicable, but in addition terrorism- and possibly also CBRN-related aspects need attention.

4.4.1. Challenges for communication

The challenges for communication in the case of terrorism crises are many. Terrorism intends to arouse fear and insecurity, and by its malicious intent creates strong emotions while there may also be the threat of repetition. Although the idea of a panic-prone public is considered a myth, terrorism nevertheless creates high levels of anxiety. People's view on the world may change, creating a need for sense-making and socially supportive communication. Fear and misperceptions may lead to unexpected behaviour, and maintaining credibility and trust in institutions becomes difficult.

Media discourse about terrorism may further add to conflicts in society. The evolving large-scale social media discourse is difficult to monitor. Since terrorism crises are considered low probability with potential for much damage, people feel that the authorities should take responsibility.

CBRN terrorism crises involve an array of hazardous materials of which public groups have little knowledge. For response organizations, there is difficult content that must be explained. Such crises are characterized by uncertainty and rapidly evolving information. Public groups need continuously updated information and often over a long period of time. The needs of public groups differ widely according to their level of exposure to the CBRN material in question.

4.4.2. *Implications for communication practice*

Based on these communication challenges, implications for practice can be outlined. Preparedness for such diverse low-probability crises can best be included in a wider educative approach. The mitigation of large-scale crises needs a task force of high capacity, possibly through pooling expertise and cooperative training, and supported by joint facilities such as high-capacity crisis websites and call centres for various types of crises. Communication must be integrated into crisis management, and therefore, the challenges of communication need to be understood by crisis managers, while communication experts need to familiarize themselves with the existing procedures and also, especially in the case of CBRN terrorism, the relevant jargon. Cooperation between the health and rescue sectors needs attention, including where this concerns the development of joint communication strategies.

With respect to the communication activities themselves, close monitoring of the risk perceptions and information needs of public groups, including possible misperceptions, is important. This requires competences in social media, in particular the use of monitoring tools, and methods of data interpretation that can lead to decision-making on communication strategies. Terrorism crises call for fast information updates that, using a multi-channel approach, can be tailored to fit different needs and media habits. This is similar to communication activity in other types of crisis, but in large-scale terrorism incidents, it becomes even more urgent.

In the case of CBRN terrorism crises, affected publics need detailed health-related information, while a wider group of people is also involved. Human behaviour and ethical aspects should be taken into account, for example, in communication on evacuations and medical treatment. Moreover, communication needs to be socially supportive, showing empathy and facilitating sense-making to strengthen community resilience. CBRN crises can have long-term consequences, so that

mitigation and aftercare may overlap and need communicative attention over a prolonged time span.

4.4.3. *Limitations and implications for research*

The focus of this paper is on communication in the case of terrorism, with CBRN terrorism as a growing area of interest within this topic. As this was not a comparative study, the present findings cannot outline to what extent communication in terrorism crises is different from communication in other kinds of crises. Nor do the findings permit one to say which pose the bigger challenge, the aspects of terrorism *per se* or the CBRN aspects of terrorism, as this will depend on the case in question. Future research could take a broader overview of the crisis categories under consideration. For now, however, this paper brings together insights gathered from the literature on communication supporting crisis management in the case of terrorism.

In the literature, the challenges presented by terrorism crises of very different types were not clearly linked to particular options for communication strategy decision-making. This may point to a need for a comprehensive communication strategy model that would address the different kinds of terrorism crises in a holistic way, taking into account the variety of response organizations, diversity of target groups and all the phases of a crisis – topics that were also addressed in the literature. In this way, knowledge about strategy-making for communication aimed at promoting a resilient society could be further developed. Nowadays, this should include social media, as such crises evoke emotions and give rise to a large volume of social media interaction that calls for the development of tools and methods both for monitoring perceptions and for communication strategy-making.

Such an approach would not be complete if it did not entail partnering with the public, a best practice in risk and crisis communication (e.g., Veil, Buehner, & Palenchar, 2011), and also suggested as a remedy for improving communication about the highly uncertain, diverse, unpredictable, infrequent, unfamiliar, uncontrollable and unknowable nature of terrorism risks and crises (Kearon et al., 2007; Meredith et al., 2007; Rogers et al., 2007; Becker, 2011; Sheppard, 2011).

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