Master thesis:

What causes the "sharp end effect" in the recall of disaster reports?

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Abstract

When people are asked to recall how disasters happened, they tend to remember most vividly and frequently the causes that were spatially and temporally close to the disaster itself, called sharp end factors. Until now, why this so-called sharp end effect occurs remained unclear. The current study investigated whether the blaming tendency of a person, the number of sharp ends mentioned, or a person's locus of control can be used to explain the sharp end effect. Eighty-three participants took part in a study wherein they had to recall three disaster stories, both directly and after one and three weeks, without reading the stories again. After the final recall, participants rated which factors contributed to the incident the most and filled in a locus of control questionnaire. Results indicated that participants in the Condition 'Blunt end blaming present' recalled significantly fewer sharp ends and blunt ends than participants in the Condition 'Blunt end blaming absent'. The sharp end effect was still present regardless of blunt end blaming manipulations. Additionally, a blunt end effect in terms of blaming tendency was found regardless of blunt end blaming or sharp end manipulations. Lastly, participants' locus of control was found to have no significant influence on recall or blaming tendency. The results of the current study do not give a clear explanation of the sharp end effect, but it was shown that recall and blaming of sharp ends and blunt ends are separate processes. For future research, the addition of sharp end blaming to the disaster stories should be investigated and the responsibility questions should be separately presented per factor.

Keywords: recall, disaster, sharp end, blunt end, sharp end effect, blaming tendency, locus of control

What causes the "sharp end" effect in the recall of disaster reports?

Disasters often involve complex and long sequences of events that have been examined by accident investigations, accident reconstructions, and accident recall. Research on accident investigation has shown that the grasping of a disaster's causes proves difficult for investigators and often results in reporting and fixing causes that are most proximate to the disaster (Cedergren & Petersen, 2011; Lundberg, Rollenhagen & Hollnagel, 2009; Lundberg, Rollenhagen, & Hollnagel, 2010; Rollenhagen, Westerlund, Lundberg, & Hollnagel, 2010). Furthermore, research by Wurster (2013) and Verschuur (2013) on accident reconstruction has also shown this tendency to report and focus on proximate disaster causes. The two authors investigated both popular and scientific publications on the Chernobyl nuclear power plant disaster (1986) and the Tenerife airport disaster (1977). Additionally, when people are asked to recount how disasters such as the space shuttle Challenger (1986) or the Tenerife airport disaster (1977) came about, they tend to remember most vividly and frequently the causes that were spatially and temporally close to the disaster itself (Moning, 2014). For example, the cold O-rings of the space shuttle or the actions of the KLM pilot, respectively. Little attention has been paid to what could be possible explanations for this effect of focusing on proximate disaster causes. This so-called "sharp end effect" is a very specific phenomenon that has only been demonstrated so far with disaster recall (Moning, 2014).

This report will start by explaining the distinction between the two types of disaster causes, namely blunt end and sharp end causes. Furthermore, previous research on accident investigation, accident reconstruction, and accident recall will be discussed. Several theories of blaming will be presented and used to provide a possible explanation of the sharp end effect. Next, the concept of locus of control will be introduced and included as an additional exploratory variable for the sharp end effect. Lastly, the different paragraphs will be summarized in terms of their relevance for the current research, its research question and hypotheses will be proposed.

Literature review

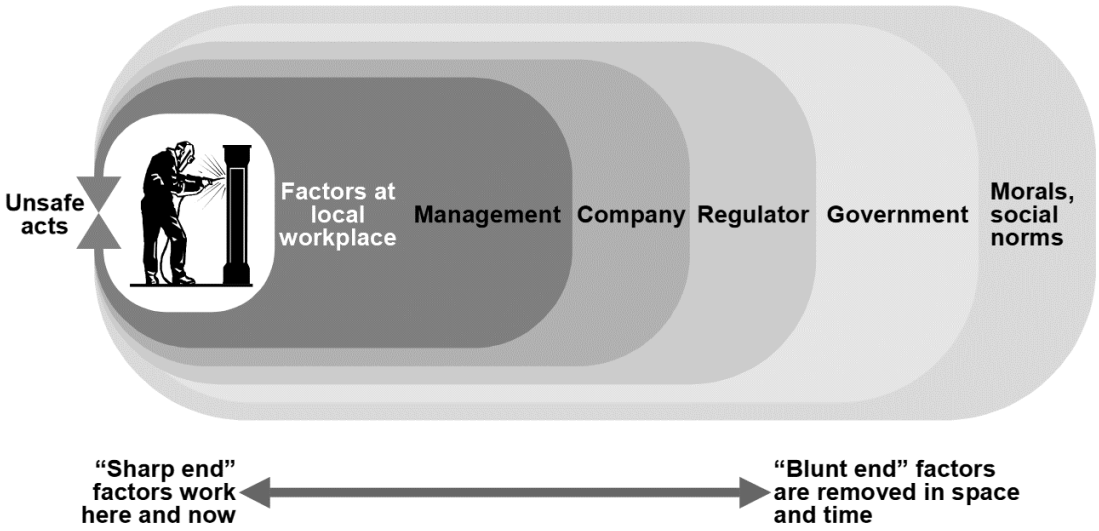
Sharp ends versus blunt ends

Before going more into depth on possible explanations for the sharp end effect, it is important to understand the distinction between blunt end and sharp end factors or causes of disasters. A visualization of this distinction can be found in Figure 1. In general, several factors can influence an actual disaster. For example, the main factors usually consist of institutional,

organizational, work environment, team, individual, and task factors (Vincent, Taylor-Adams, & Stanhope, 1998). Each main factor has several contributory factors, for instance, economic pressures, financial priorities, staffing, communication, knowledge, or task design to name some (Rasmussen, 1997). The distinction between sharp end and blunt end factors is quite common across various models, such as the latent failure model of Reason (1990) or the accident causation model of Rasmussen (1997) and Svedung and Rasmussen (2002).

Figure 1

Factors influencing the development of a disaster from Hollnagel (2002)



According to Reason (1997), active failures refer to actions produced by front-line professionals that are directly involved with the process at hand, thus they are a factor at the sharp end. The consequences of actions at the sharp end are often immediately obvious (Besnard & Hollnagel, 2014). These operators at the sharp end intend to protect the system from their own and others' errors. Even though operators at the sharp end conduct errors themselves from time to time, they also provide the needed resilience and expertise to imperfect technical systems with their non-technical skills (Flin & O'Connor, 2017; Reason, 1997) According to Reason (1990, p. 173) "[r]ather than being the main instigators of an accident, [sharp end] operators tend to be inheritors of system defects created by poor design, incorrect installation, faulty maintenance, and bad

management decisions. Their part is usually that of adding a final garnish to a lethal brew whose ingredients have already been long in the cooking". For instance, a pilot or surgeon making an erroneous decision resulting in an accident would be considered a sharp end cause. In the current study, sharp end factors are defined as aspects of people that are temporally and spatially close to the disaster.

In contrast, latent failures refer to actions that are produced in earlier stages by operators hidden and further removed from the active end, with consequences of their actions being less obvious. According to Reason (1990, p.173), "the adverse consequences [of latent failures] may lie dormant within the system for a long time, only becoming evident when they combine with other factors to breach the system's defenses". For instance, an organization's safety culture, time pressure, or even government regulations that contributed to the accident would be considered blunt end causes. Yet, blunt end factors are still crucial because they can lead to an outcome failure by constraining sharp end factors (Lundberg et al., 2009; Reason, 1990). In the current study, blunt end factors are defined as aspects of objects, people, or the underlying organization that are temporally and spatially further away from the disaster.

Rasmussen (1997) also points out the complexity and dynamics of adaptive socio-technical systems that ultimately result in disasters. These adaptive socio-technical systems are surrounded by competitive environments or regulatory conditions which are all grouped under blunt end factors. For the individual decision-maker of such a system as well as for readers of disasters, it is often difficult to grasp the full picture or dynamic flow of the events (Rasmussen, 1997). During disasters, usually, a complex sequence of events is happening with both blunt end and sharp end factors being involved to a greater or lesser extent. Several preliminary attempts have been made to explain the sharp end effect, by reviewing and investigating accidents, publications on those accidents, and recall of accidents, all of which will be discussed in the following.

Accident investigation

In accident investigation, investigators try to apply existing accident models by looking at what led to the accident itself, which factors were playing a role, and what recommendations can be done to prevent future accidents (Lundberg et al., 2009). The typical approach when investigating causes of accidents or disasters is the so-called What-You-Look-For-Is-What-You-Find (WYLFIWYF), which is a process with which causes first get identified and fixed by remedial actions (Hollnagel, 2008; Lundberg et al., 2009). However, due to the increasing complexity of

disasters, this usual WYLFIWYF principle is not always applicable. It often results in trying to fix specific, individual problems close to the disaster that was found during the investigation (Lundberg et al., 2009).

Similar results were also found by Cedergren and Petersen (2011), showing that accident investigations considerably emphasize causes at the micro-level such as physical processes, equipment, or actor activities. In turn, investigators pay less attention to the meso-level, such as organizational factors or macro-level such as regulations of the government. Cedergren and Petersen (2011) concluded that greater diversity among investigators in terms of technical and operational background is needed to enhance the scope on what factors are causes and how the different factors interacted. Even though this change of perspective did take place in accident investigations, an emphasis on human error is still visible (Dekker, Nyce & Myers, 2013). Research by Rollenhagen et al. (2010) found that technical factors were often not seen as a salient cause, but that the samples rather perceived the technologies' performance as expected and considered technical weaknesses as a symptom of non-technical factors. In sum, although several attempts have been made at reducing the emphasis or focus on sharp end factors during accident investigations, this focus on sharp ends is still very prominent. How this tendency is reflected in the actual publication of the disasters will be discussed in the following part.

Accident reconstruction

In general, people tend to deal with complexity through oversimplification (Feltovich, Hoffman, Woods & Roesler, 2004). Research by Feltovich et al. (2004) has shown that people tend to reduce complex information into simple and understandable components, the so-called reductive tendency when being asked to reproduce information. Geurts (2013) explained that authors are intentionally reducing disaster descriptions because they do not regard every information as necessary to mention as it seems either too obvious to mention or is not necessary to support their argument. Furthermore, news media often make use of framing, meaning that the media tends to select things such as visual images or journalistic analysis to highlight some aspects of an event while ignoring or downplaying others (Druckman 2001; Haider-Markel & Joslyn 2001; Iyengar 1991; Scheufele, 1999). As a result, the disaster descriptions that one reads in a report or the news are already a reduction of the complex reality of the disaster. Thus, the reductive tendency of disaster reports could influence what people remember as they do not get presented with all facts. Of course, it is frequently not feasible to do so due to, for instance, word limits imposed on news

media. However, it is important to create a consciousness among people that any description or report of a disaster is also a simplification of what happened and vary among authors, to prevent future distortions (see Geurts, 2013; Vicente & Brewer, 1993).

Verschuur (2013) conducted a literature review on 31 non-scientific and 31 scientific articles reports of the Chernobyl disaster with a minimum length of 100 words and a maximum length of 500 words. Similarly, Wurster (2013) conducted a literature review on 38 scientific and 29 non-scientific disaster reports of the Tenerife disaster with a minimum length of 100 words and a maximum length of 500 words. Both Verschuur (2013) and Wurster (2013) found a high information reduction regarding the causes of the accident over time. Additionally, the focus on sharp end factors was significantly higher for non-scientific articles than for scientific articles of Chernobyl (Verschuur, 2013). Verschuur (2013) suggested that this focus is either due to the story-like construction of non-scientific articles which makes them interesting to read or it is due to the human factor at the sharp end. The concept of human error was mentioned more often in non-scientific articles which might be due to the Western culture, more specifically due to the personal responsibility in failure and achievement (Dekker & Nyce, 2012; Verschuur, 2013). In contrast, Wurster (2013) found that sharp end factors were mentioned significantly more often in both scientific and non-scientific disaster reports of Tenerife than blunt end factors.

Geurts (2013) conducted a literature review on 21 scientific and 17 non-scientific disaster reports of the Challenger disaster with a minimum length of 50 words and a maximum length of 500 words. In contrast to the results of Verschuur (2013) and Wurster (2013), Geurts (2013) did not find a significant difference in the occurrence of sharp end and blunt end factors in publications of the Challenger disaster. One reason for these results could be that there were no sharp end factors involved in the decision making or in the Challenger disaster itself. The decision making was made the day before by other people than the crew and the sharp end factors temporally close to the disaster were more technically-related such as the O-rings that froze due to low temperatures. In contrast, in the Tenerife disaster, the cockpit crew and in the Chernobyl disaster the nuclear power plant operators were both spatially and temporally close to the disaster and involved in the decision making.

As a reduction of information is impossible to avoid, Geurts (2013) suggested that one should be careful with such reports to avoid misconceptions. For instance, one can reduce this by using original investigation reports instead of secondhand sources (with the caveat mentioned in

the previous section that accident reports also suffer from a focus on sharp ends). Building upon the distinction made by Vicente and Brewer (1993) between the accuracy and completeness of the original sources and the subsequent recall of those sources, a likely explanation for the focus on sharp ends might be due to recall processes. That is, even when sources present a well-balanced account of both blunt ends and sharp ends, selective encoding might lead to an unbalanced recall of sharp ends. In the following, another line of research will be discussed on what people are recalling of disaster stories after reading them.

Accident recall

Moning (2014) investigated the effects of story grammar, thus the predetermined order or leitmotiv of a text, on people's recall of sharp end and blunt end factors after reading a disaster report. Participants read two disaster stories with a length of around 300 words, one on the Challenger and one on the Tenerife disaster (Moning, 2014). Both disasters varied according to their story grammar, thus whether a story grammar was present in the report or not. Furthermore, the stories varied in the number of sharp ends and blunt ends mentioned, including either four sharp end causes and two blunt end causes or vice versa. The combination of the two variables, story grammar and the number of sharp end and blunt end causes, led in total to four different versions of the Tenerife and four of the Challenger disaster. After reading each story, participants filled out a crossword puzzle intended to erase information in working memory and were then asked to write everything down that they remembered of the article they just read (Moning, 2014).

The results showed, first and foremost, a sharp end effect, namely that participants recalled significantly more sharp end than blunt end causes, regardless of the number of sharp ends and blunt ends included in the texts. Additionally, the number of recalled sharp end and blunt end causes was significantly lower for the Challenger disaster than for the Tenerife disaster (Moning, 2014). Moning (2014) suggested that these differences were due to the Challenger disaster being more technical and therefore, more difficult to comprehend than the Tenerife disaster. This technical complexity might also serve as another explanation of the results found by Geurts (2013). Besides, this sharp end effect occurred regardless of whether a story grammar was present or not (Moning, 2014). Therefore, the mere presence of a story grammar cannot be used to explain the sharp end effect for recalling disaster-related information or causes. Furthermore, a main effect of story grammar was found by Moning (2014), such that participants remembered and recalled more information when a story grammar was present. This effect of story grammar on memory was

previously reported by Mandler and Johnson (1977) and Thorndyke (1977), with stories that conformed more to an ideal story grammar structure being better recalled than those deviating from it.

Several limitations of Moning's study (2014) are worth mentioning, namely, that recall was conducted only at one point in time and that it has not been tested what happens when the disaster report contains an equal number of sharp ends and blunt ends. Furthermore, the Tenerife and Challenger disaster are both complex disasters for readers that are not familiar with disasters. The current study aims to control for these limitations by choosing for disasters with fewer technical or complex details. Additionally, the recall of different disasters will be measured over several weeks, to establish the robustness of the sharp end effect.

The emphasis on the sharp end factors can be explained by the Western moral enterprise but also because finding a cause of or a factor that is blameworthy for an accident is inherent to human nature (Dekker & Nyce, 2012; Monroe & Malle, 2019). In turn, the blaming tendency of a person likely influences what she or he devotes attention to and thus results in different elements of disasters getting stored and recalled. Thus, it could be that the sharp end effect in terms of recall, as shown by the study of Moning (2014), is because people blame those most closely in time and space to the actual outcome of the accident. In the following paragraph, this inherent blaming tendency of humans will be explained and an explicit connection made with the memory phenomenon of the sharp end effect.

Blaming tendency

Research within social psychology has suggested that people make initial, quick attributions based on their prior beliefs or experiences (Anderson, Krull, & Weiner, 1996). When people are presented with multiple explanations, they tend to accept the explanation that is most plausible to them and reject those seeming implausible based on their accessible knowledge structures such as intuitive causal theories (Anderson et al., 1996). As stated by Rasmussen (1997), accidents are often attributed to human errors and independent failures, which is often an inadequate conclusion regarding the actual causes of the accident. It has been suggested that people tend to blame more the people that were closest to producing but also to possibly avoiding the accident as it is more emotionally satisfying and convenient (Beso, Franklin, & Barber, 2005). Furthermore, Hollnagel (2004) also explained that with a safety culture focusing on mistakes and sanctions, blaming someone creates a certain authority or power which makes management prone

to blame the bottom of the hierarchy, namely the sharp end. Therefore, one possible explanation of the sharp end effect could be that people recall sharp ends better because blaming a specific human operator or person seems more plausible and easier to do than blaming a complex system or organization.

Furthermore, it has been proposed within the area of philosophy that people tend to scapegoat other people or a group of people due to reasons such as maintaining a moral value or perceived personal control (Rothschild, Landau, Sullivan & Keefer, 2012). Scapegoating is defined as "the act of blaming and often punishing a person or a group for a negative outcome that is due, at least in large part, to other causes" (Rothschild et al., 2012, p. 1148). With scapegoating, people try to minimize feelings of guilt regarding their own responsibility for a negative outcome by transferring the blame towards other individuals or a group (Douglas, 1995). Additionally, it has been shown that people tend to "externalize blame for negative outcomes that would otherwise incriminate themselves or their group" (Rothschild et al., 2012, p. 1149).

Scapegoating serves as a strategy to maintain the image of an orderly, stable, and predictable external world (Allport, 1948). According to Lagnado and Channon (2008), people are seeking causal explanations for how and why things happen in their daily life. Scapegoating helps people to restore perceived control and provides them with a simple explanation of the event as scapegoats can be clearly identified in contrast to the usual chaotic factors (Rothschild et al., 2012). The success of scapegoating depends on whether a person perceives the target as a viable or nonviable scapegoat based on the target's ability and intent to deliberately cause the outcome or not (Glick, 2005). Even if there is no plausible reason, "it is possible that people prefer seeing viable scapegoats as responsible for a seemingly random negative outcome to leaving that outcome unexplained" (Rothschild et al., 2012, p. 1149). Based on these suggestions, the current study will investigate whether a person's blaming tendency can be influenced or changed when offering the reader a scapegoat to blame, in this case, the blunt end factors.

According to the culpable control model of Alicke (2000), it is assumed that people's spontaneous and quick assessment or evaluations encourage blame judgments. According to Lagnado and Channon (2008, p. 757), "[t]hese evaluations are less deliberative than judgments of personal control and can lead to significant biases in the processing of relevant information. In particular, they typically result in greater blame being ascribed to human agents, and less notice taken of mitigating circumstances". Furthermore, Alicke, Davis, and Pezzo (1994) found that this

greater ascription of the blame also resulted in distorted causal control assessments that people used to justify their blame attributions. In many cases, the people rather than environmental factors are perceived as the primary controlling forces that underlie negative evidence (Cook & Woods, 1994; Jones, 1990). This perception is based on the temporal and physical relationship of the human operators to the outcome (Cook & Woods, 1994). Human actions usually seem more controllable, easier to imagine and are often the abnormal feature in ordinary situations (Alicke, 2000; Kahneman & Miller, 1986; Hart & Honoré, 1985). However, it remains unclear whether causal attributions are made to factors that are at the beginning of the causal chain, thus a primacy effect, or to factors that are directed to the factors at the end of the causal chain, thus a recency effect (Einhorn & Hogarth, 1986; Miller & Gunasegaram, 1990; Johnson, Ogawa, Delforge, & Early, 1989; N'gbala & Branscombe, 1995; Vinokur & Ajzen, 1982). However, according to Alicke (2000), the more proximate the action and its effect are, the greater the causal control over the outcome is and results in a higher degree of causality. Therefore, the current study investigates whether removing sharp end factors from the disaster stories, thus the factors that are suggested to receive the blame, will influence both recall and blaming tendency.

In philosophy, two perspectives on blaming are proposed which differ in the way that people attend new incoming information and how or whether their blame judgment changes, namely the socially regulated blame perspective and the motivated-blame model. It is worth mentioning that both theories are important and compatible as they apply to different conditions of blaming (Monroe & Malle, 2019). According to the socially regulated blame perspective, blaming is usually a socially regulated process with people systematically attending and processing blame-relevant information (Monroe & Malle, 2019). Offering a warrant is a social demand required when people blame others, as it provides them with evidence that one's moral judgments are justified and fair (Monroe & Malle, 2019; Voiklis & Malle, 2018). As the research of Malle (2021) has shown, the best way to support warrants for blame judgments can be done by presenting information that is usually already processed by the reader to form a blame judgment, such as causality, reasons, and evidence supporting these inferences. If the reader gets new information, it is predicted that they flexibly revise their blame judgments if the information is meaningful to them (Monroe & Malle, 2019). Thus, by publicly expressing blame, these blame judgments are expected to become more nuanced and systematic (Monroe & Malle, 2019).

According to the motivated-blame model, blaming is considered as an inherent desire that is driven by people's intuitive emotional responses and their need to rationalize and explain norm-violating behaviors (Greene, 2008; Monroe & Malle, 2019). Therefore, their need to find someone to blame is biased in that they favor information that confirms their existing blame judgment over information that would mitigate the blame (Alicke, 2000; Ames & Fiske, 2013). It has been suggested that negative evaluations or spontaneous reactions lead people to see the source as blameworthy and interpret available evidence in a way to support this blaming hypothesis (Alicke, Rose, & Bloom, 2011).

In summary, the main difference between the two perspectives is to what extent the person is willing to adjust her or his initial blame judgment based on new incoming and relevant information. In the study, the focus will be on the socially regulated perspective, because it will be tested whether the readers quickly adjust their initial blame judgment when presenting them with blunt end blaming. As stated by Monroe & Malle (2019), the blame judgment of a person influences what kind of information she or he pays attention to. In turn, this will also influence what kind of information is getting processed, stored, and consequently recalled. For the current study, it will be investigated whether the underlying processes of blaming tendency and recall are connected or separated. If the blaming tendency and recall underlie connected processes, then the addition of blunt end blaming will result in both higher blame towards blunt end factors and a higher blunt end recall. In contrast, if the blaming tendency and recall underlie separate processes, then the addition of blunt end blaming will result, for instance, in higher blame towards blunt end factors but will not affect or lower blunt end recall. With our initial assumption that people recall sharp ends better because they assign more blame to sharp end factors, it will be expected that the blaming tendency and recall underlie connected processes. Thus, by the addition of blunt end blaming it is expected that people will revise their initial sharp end blame judgment to blunt end blame judgment. In turn, this will affect their information processing and ultimately result in blunt end factors getting better recalled than sharp end factors.

Whether scapegoating is successful and restores perceived control likely also depends on the individual predisposition or personality traits. For instance, in how far or to what extent the person thinks the environment can be influenced or controlled, in other words, the locus of control of a person (Rotter, 1966). In the following, the concept of locus of control will be explained and discussed.

Locus of control

According to Wang and Lv (2017, p. 2339), locus of control is defined as "a generalized enduring expectancy or belief about how responsive and controllable the environment is". Overall, a distinction is made between internal and external locus of control, however, it can also be the case that the tendency is equal between these two. The type of locus of control a person has depends on whether the person sees a causal relationship between her or his own behavior and the reward or not (Rotter, 1966). When people have an internal locus of control, they usually "believe that the environment is responsive to their own relatively permanent characteristics and that rewards are contingent on personal actions […]" (Wang & Lv, 2017). Additionally, they tend to see themselves as responsible for the outcomes of their actions (Suárez-Álvarez, Pedrosa, García-Cueto, & Muñiz, 2016). In turn, people with an external locus of control tend to see external rewards and their environment as uncontrollable. These people tend to give credit to external factors such as coincidence or luck if their actions turn out to be successful or unsuccessful (Rotter, 1966; Weiner, 1979). Taking this further, it could be that the type of locus of control, thus the view one has on the events or environment, influences or directs the reader's attention to particular aspects of stories. In other words, it could be that people with an external locus of control, or an equal tendency focus on and recall different aspects of a story, for instance, the number of sharp ends or blunt ends, than people with an internal locus of control.

An important distinction should be made here, namely between attributional explanations which are mostly post hoc, while locus of control is more about the prediction of the ability one has to control the future (Galvin, Randel, Collins & Johnson, 2018; Ng, Sorensen, & Eby, 2006). More specifically, attribution theory focuses on the causal inferences people make (Heider, 1958; Kelley, 1973; Weiner, 1986). Thus, attributions and locus of control can be aligned or misaligned. For instance, a person may think that the illness she or he experiences is due to factors beyond her or his own control (external attribution) but believes that they can exert some control to promote recovery (internal locus of control; see White, Lehman, Hemphill, Mandel, & Lehman, 2006). Based on these findings and the scapegoat theory, it is hypothesized that people with an external locus of control or an equal tendency have a different blaming tendency as they attribute the cause to a different scapegoat than people with an internal locus of control.

Current study

The main purpose of the current study is to investigate possible causes of the sharp end effect in the recall of disaster reports. The study intends to replicate the work of Moning (2014) as the main framework, but at the same time also adds certain changes and extensions to it. Additionally, it will be investigated whether or not there is a connection between the recall and blaming tendency of sharp ends and blunt ends. With the extensions of the current study, it will be explored whether people tend to recall sharp ends more frequently because they search for someone, thus a person, to blame rather than something or an organization to blame. To answer the research question of "What causes the sharp end effect in the recall of disaster reports?", the following hypotheses will be tested.

Recall

The current study will explore how people recall which percentages of sharp ends and blunt ends with different types of conditions. Based on the socially regulated blame perspective of Monroe and Malle (2019) and the preliminary findings of Moning (2014), it is predicted that the addition of blunt end blaming will affect information processing and result in a different recall of texts. If blunt end blaming is added to the texts, it is expected that the reader's attention will be shifted towards blunt ends and result in a poorer recall of sharp ends due to systematically attending and processing blame-relevant information. The addition of blunt end blaming is also expected to result in an increased blunt end recall in comparison to the absence of blunt end blaming due to the same argumentation. Based on the research of Lagnado and Channon (2008), it is predicted that the sharp end removal will reverse people's quick evaluations of situations and thus influence both processing and recall of information. Through the sharp end removal, it is expected that people will pay more attention to the mitigating circumstances, the blunt ends, which will result in an increased recall of blunt ends than for texts with sharp ends present.

Most studies, including the research of Moning (2014), just measure recall at one point in time. There is no literature available on the recall of sharp ends and blunt ends over weeks with the current manipulations of blunt end blaming and number of sharp ends. Therefore, no directed hypotheses for the effects over weeks can be posited. Going further, as disasters usually always involve sharp ends and blunt ends, the sharp end removal will likely result in a different recall order than for disasters where sharp ends are mentioned. Also, it is predicted that the addition of blunt end blaming will result in a different recall order than the absence of blunt end blaming. As there

is no literature available on the differential recall order of sharp ends and blunt ends, we cannot posit a directed hypothesis for the effect on recall order. The following set of hypotheses was posed to investigate the recall of sharp ends and blunt ends:

1. The recall of sharp ends will be higher for participants who read texts without blunt end blaming at the end than for participants who read texts with blunt end blaming at the end
2. The sharp end recall will differ over time between participants who read texts with blunt end blaming at the end and participants who read texts without blunt end blaming at the end
3. The recall order of sharp ends will differ between participants who read texts with blunt end blaming at the end and participants who read texts without blunt end blaming at the end
4. The recall of blunt ends will be higher for participants who read texts without sharp ends than for participants who read texts with sharp ends
5. The recall of blunt ends will be higher for participants who read texts with blunt end blaming at the end than for participants who read texts without blunt end blaming at the end
6. The blunt end recall will differ over time between participants who read texts with sharp ends and participants who read texts without sharp ends
7. The blunt end recall will differ over time between participants who read texts with blunt end blaming at the end and participants who read texts without blunt end blaming at the end
8. The recall order of blunt ends will differ between participants who read texts with sharp ends and participants who read texts without sharp ends
9. The recall order of blunt ends will differ between participants who read texts with blunt end blaming at the end and participants who read texts without blunt end blaming at the end

Blaming tendency

Based on the assumptions of the scapegoat theory (Rothschild et al., 2012; Glick, 2005) and the socially regulated blame perspective (Malle, 2021; Monroe & Malle, 2019; Voiklis & Malle, 2018), it is predicted that the addition of blunt end blaming and removal of sharp ends will influence reader's blaming tendencies towards sharp ends and blunt ends. The addition of blunt end blaming will likely increase the blame towards blunt ends, as the readers are offered a warrant and viable scapegoat in comparison to texts without blunt end blaming. Due to the same argumentation, the addition of blunt end blaming will likely decrease the blame towards sharp ends in comparison to texts without blunt end blaming. The sharp end removal will likely result in an

increased blunt end blame as the blunt end is the only available viable scapegoat mentioned in the disaster. In turn, the sharp end removal will likely also result in a decreased sharp end blame due to the same argumentation. The following set of hypotheses was posed to investigate the blaming tendency towards sharp ends and blunt ends:

10. The assigned blame towards sharp end factors will be higher for participants who read texts with sharp ends than for participants who read texts without sharp ends
11. The assigned blame towards sharp end factors will be higher for participants who read texts without blunt end blaming at the end than for participants who read texts with blunt end blaming at the end
12. The assigned blame towards blunt end factors will be higher for participants who read texts without sharp ends than for participants who read texts with sharp ends
13. The assigned blame towards blunt end factors will be higher for participants who read texts with blunt end blaming at the end than for participants who read texts without blunt end blaming at the end

Locus of control

Lastly, it will be explored whether a person's locus of control directs one's attention more to blunt end or sharp end factors and thus result in an increased or decreased recall (Rotter, 1966). It will also be examined whether a person's locus of control influences the blaming tendency, as they could differ in whether they perceive the sharp end or blunt end factors as viable scapegoats (Glick, 2005; White, Lehman, Hemphill, Mandel, & Lehman, 2006). No directed hypotheses will be posited regarding locus of control, given the absence of relevant literature. The following set of hypotheses was posed to investigate the blaming tendency towards sharp ends and blunt ends:

14. There will be a difference in sharp end recall based on the participant's locus of control
15. There will be a difference in the assigned blame towards sharp end factors based on the participant's locus of control
16. There will be a difference in blunt end recall based on the participant's locus of control
17. There will be a difference in the assigned blame towards blunt end factors based on the participant's locus of control

Method

Participants

Ninety-six students currently or previously enrolled at universities participated in the experiment. For the experiment, a sufficient understanding of English and the ability to answer questions written in English was required, as participants had to read, recall and answer questions about disaster stories written in English. This was ensured by only including participants who completed their A-level with English courses taken until the final A-level year. In other words, participants' English level had to be between B2 and C1, which universities with English study programs usually require for enrolment. If participants were not enrolled in an English study program, they were judged on a question about how they perceive their English reading and understanding skills (see Appendix A). Participants that had foreknowledge about the disasters were excluded from the study. Three participants turned out to be not suitable for the experiment, as they had in-depth knowledge about at least one of the disasters. Another five participants were excluded from the results as well as they dropped out after the first or second session of the experiment. Furthermore, three participants were excluded because they indicated on a question that was asked at the very end of the experiment that they searched for information on the Internet about the disasters during the experiment (see Appendix A). Lastly, two participants were left out due to extremely low recall scores compared to the rest of the sample and were identified as outliers, leaving 83 valid cases for the current study.

Description of the sample

Regarding gender, 27 (32.5%) were male, 55 (66.3%) were female and one participant identified as another gender (1.2%). The age ranged between 21 and 35 years, with a mean age of 24.22 years (SD = 2.38). Furthermore, 27 (32.5%) participants had a Dutch nationality, 40 (48.2%) had German nationality and 16 (19.3%) had another nationality. In total, 72 (86.7%) participants indicated that they are or were enrolled in a study program taught in English at a university or university of applied sciences, 8 (9.6%) were temporarily enrolled and 3 (3.6%) were not enrolled. Participants that were not or only temporarily enrolled rated their ability to read English texts or stories as sufficient (rating at least 4 out of 7, see Appendix A). No differences were found in terms of content and length of the written texts in comparison to participants enrolled in a study program taught in English. Therefore, these participants were included in the study. Participants were recruited through convenience sampling. Before the experiment, the participants needed to give

their informed consent for participation (see Appendix B), in accordance with ethical guidelines and procedures of the University of Twente. The study was approved by the BMS Ethical Committee of the University of Twente.

Materials

As participants had to read and recall stories about different disasters, several research articles were searched and retrieved from the databases of www.google.com and www.google-scholar.com. The requirements for the search were that both scientific and non-scientific publications were available for the disaster and the disaster needed to consist of at least two blunt end and two sharp end factors. Three accidents were chosen, namely the train disaster of Eschede (1998) in Germany, the Kiss Nightclub Disaster (2013) in Brazil, and the WHO concert disaster (1979) in the USA. Both scientific and non-scientific publications can be found in Appendix C. Participants received three different shortened disaster reports that were based on the original disasters of Eschede, Kiss Nightclub, and WHO concert with a length of a maximum of 350 words (see Appendix D). The original texts were partly changed for the purpose of the study. For instance, fictional causes were added to the stories, to arrive at an equal number of four sharp ends and four blunt ends. Each disaster consisted of four different versions, differing in whether blunt end blaming was present or absent and in the number of sharp end causes mentioned either four or none (see Appendix D). The number of words or sentences missing when no blunt end blaming or sharp ends were mentioned in the text was filled up with additional neutral, contextual information that was neither related to blunt- nor sharp ends. The different versions of each disaster were controlled for readability and the level of abstractness and concreteness (see Appendix D). For readability, ensuring that they have the same length of sentences and number of words, the text was run through an algorithm (see http://www.readabilityofwikipedia.com). To compare readability across the different versions of the disasters, the Flesch-scores were calculated to indicate how difficult it is for a reader to understand the selected English passages. The Flesch-scores of all articles were between 57 and 73, indicating that the different disaster stories had a good and similar reading level (see Appendix D). For determining and controlling the level of abstractness and concreteness, the number of concrete and abstract words was counted with help of a validated list of concrete and abstract words (Brysbaert, Warriner & Kuperman, 2014), and the percentages for each disaster story calculated (see Appendix D). The deviations in terms of level of abstractness and concreteness across the different disaster versions were kept at a maximum of 5%.

The Internal-External Locus of Control Scale of Rotter (1966) was used to determine the participant's locus of control at the end of the experiment. According to Wang and Lv (2017), the scale is most widely used and has food psychometric properties, with good average reliability of 0.70 (Ng et al., 2006). Furthermore, the scale correlates well with other methods to assess the locus of control (Wang & Lv, 2017). It consists of 29 forced-choice items, including six filler times to make the purpose of the test more ambiguous (see Appendix E).

Coding schemes

The coding scheme of Moning (2014) was used as an example and then adjusted to the criteria of the current study. For each condition, a slightly different coding scheme was developed as the manipulations resulted in a slightly different categorization of information and text order (see Appendix F). For the Condition 'Blunt end blaming present/Sharp ends present', four categories were created, namely contextual information, sharp end factors, blunt end factors, and charges towards the blunt end mentioned. For the Condition 'Blunt end blaming absent/Sharp ends present', three categories were created, namely contextual information, sharp end factors, and blunt end factors mentioned. For the Condition 'Blunt end blaming present/Sharp ends absent', three categories were created, namely contextual information, blunt end factors, and charges towards the blunt end mentioned. For the Condition 'Blunt end blaming absent/Sharp ends absent', two categories were created, namely contextual information and blunt end factors mentioned.

Four different second-raters were assigned to different conditions, where each filled in the coding schemes of eight participants. Cohen's κ was run to determine if there was agreement on whether the coding schemes for the different conditions would be filled in similarly. According to the guidelines of Landis and Koch (1977), there was almost perfect agreement in terms of Condition 'Blunt end blaming present/Sharp ends present' coding schemes, $\kappa = .868$ ($p < .001$), substantial agreement in terms of Condition 'Blunt end blaming absent/Sharp ends present' coding schemes $\kappa = .708$ ($p < .001$), Condition 'Blunt end blaming present/Sharp ends absent' coding schemes $\kappa = .787$ ($p < .001$) and Condition 'Blunt end blaming absent/Sharp ends absent' coding schemes $\kappa = .797$ ($p < .001$).

Design

A between-subjects design with three measurement points in time was chosen since the recall and assigned blame scores of participants in the four conditions were compared with each

other. The four conditions resulted from a two-by-two fully factorial design, which can be found in Table 1. The independent variables were the two manipulations namely Sharp ends (present/absent) and Blunt end blaming (present/absent). Note that we chose for the selective removal of sharp ends rather than blunt ends, as we already had preliminary evidence for the existence of a sharp end effect (Moning, 2014), and would obtain more conclusive evidence if we were able to eliminate the sharp end effect. We manipulated the inclusion of blunt end blaming rather than sharp end blaming for the same reasons as mentioned above with the manipulation of sharp ends in the text.

The recall and recall order were measured with a free recall task over three points in time. In the study of Moning (2014), a free recall task was used by asking participants to write down as many aspects as they can recall from reading about the disaster. Similar studies about recall by Nevid, Pyun and Cheney (2016) and Rohrer and Pashler (2010) also made use of a free recall task. To test the effects of retention intervals of disaster stories, the recall was measured with three data points to see whether the sharp end effect stays the same over the weeks. Sharp end and blunt end causes were determined based on the categorization of different bachelor students (Moning, 2014; Wurster, 2013; Geurts, 2013). The dependent variables of Sharp end recall and Blunt end recall were averaged percentages, calculated by dividing the number of recalled sharp and blunt end elements by the number of sharp and blunt ends that could have been recalled. The dependent variables of Sharp end recall order and Blunt end recall order were the averaged delta differences in the number of sentences between the original order of sharp ends and blunt ends in the text and the order of participants' written texts. Lastly, the dependent variables of Assigned blunt end blame and Assigned sharp end blame were calculated by averaging the assigned blame by participants on several questions with a scale from 1, being not responsible at all, to 5, being extremely responsible, of each blunt end and sharp end factor. The to-be-rated sharp end and blunt end factors were all presented simultaneously per disaster in the responsibility questions. Additionally, a "Not applicable" option was added to the right side of the scale as an implicit memory test for participants who read texts without sharp ends (see Appendix G). The first session required on average 43 minutes (SD = 9.62), the second session around 18 minutes (SD = 7.3), and the last session around 42 minutes (SD = 50.92).

Table 1

Experimental conditions

		Sharp ends	
		present	absent
Blunt end blaming	present	Blunt end blaming present/Sharp ends present	Blunt end blaming present/Sharp ends absent
	absent	Blunt end blaming absent/Sharp ends present	Blunt end blaming absent/Sharp ends absent

Note. Blunt end blaming involved the absence or presence of one or two sentences of charges, named towards the blunt end at the end, and blaming words used to describe the actions of the blunt ends in a negative way. Sharp ends involved the absence or presence of four sharp end factors.

Procedure

The experiment was held online via one-on-one Google Meets conversations where participants were asked to share their microphone, video, and screen during the whole session. The structure of the experiment was based on the study of Moning (2014) and implemented with slight additions. A pilot study was conducted before the actual experiment with four participants, one in each condition, to test for understandability and time limitations.

The questions and materials that participants read and filled in were created with Qualtrics. Participants first filled in an informed consent and provided their email address, which would be later removed from the dataset. Randomization of the story order as well as of the assigned conditions was created in Qualtrics to avoid any confounding effects. The email address was used to reinvite the participants for the follow-up sessions and take previous data such as condition or order into account for the next session. Next, participants answered two questions per disaster story regarding possible foreknowledge of the disasters in written form (see Appendix A) to avoid any confounding effect due to knowledge.

Participants were not informed about the purpose of the total duration of the experiment to avoid any confounding memory effects as some would then prepare for the upcoming sessions. After randomizing the order of the stories, participants were asked to read the first story twice for which they had a maximum of five minutes, see Table 2. The reading time of five minutes per story

was based on the median of the four participants of the pilot study. A visible timer on Qualtrics was set, so that the program would automatically jump to the calculation task after five minutes or participants could advance earlier themselves if they were done before five minutes. During the calculation task, participants had to solve several subtraction calculation tasks for two minutes where they were asked to think aloud the whole time. The calculation time was based on the pilot study, where one minute was indicated as too short and three minutes as too long, therefore resulting in two minutes. With the calculation task, it was intended to distract the participants for some time to find out what participants recall without relying on their working memory. Afterward, participants were asked to write down everything that they remembered of the first disaster they read. Next, the same steps were repeated twice with two other disasters. Participants were asked at the end of the first session whether they could come back after one week to fill in a part that had not been developed yet.

After one week, the second session of the experiment took place and participants had to write down one more time sequentially what they remembered of the stories they read one week ago without reading them again. The same procedure was repeated after another two weeks during the third session. Next, participants rated each sharp end and blunt end factor in terms of contributing to the accidents. Afterward, participants filled in the 29 statements of the Internal-External Locus of Control Scale (Rotter, 1966). Finally, participants filled in demographical and background questions, see Appendix G. They also filled in questions where they should indicate whether their answers to the foreknowledge question were still valid and whether they acquired any additional information about the disasters while the experiment was going on. At the end of the last session, participants were debriefed about what the experiment was about.

Table 2

Experimental structure per week

Week	First disaster	→	Second disaster	→	Third disaster
Week 0	1. Reading text 2. Calculation task 3. Recalling text		1. Reading text 2. Calculation task 3. Recalling text		1. Reading text 2. Calculation task 3. Recalling text
Week 1	1. Recalling text		1. Recalling text		1. Recalling text
Week 3	1. Recalling text		1. Recalling text		1. Recalling text 2. Responsibility questions 3. Locus of control questions 4. Demographic questions

Data Analysis

The data were analyzed with IBM SPSS Statistics 26 and a significance level of 0.05 chosen. For the hypotheses regarding sharp end recall and sharp end recall order, a two-way repeated-measures MANOVA was conducted. To investigate blunt end recall and blunt end recall order, a three-way repeated-measures MANOVA was conducted. For the hypotheses regarding blaming tendencies towards sharp- and blunt end factors, a two-way MANOVA was conducted. Finally, for the hypotheses regarding the locus of control, a one-way MANOVA was conducted.

First, the overall recall of the different disaster stories was investigated and compared with each other. Then, normality checks were conducted, and the data prepared. Descriptive statistics for the independent variables (Blunt end blaming, Sharp ends) and dependent variables (Blunt end recall, Blunt end recall order, Assigned blunt end blame, Sharp end recall, Sharp end recall order, Assigned sharp end blame) were calculated. Finally, several statistical analyses for testing the different hypotheses were conducted comparing the effect of sharp end presence or absence and blunt end blaming presence or absence.

Results

Normality checks and data preparation

First, the different dependent variables, namely the number and order of recalled elements as well as assigned blame to sharp end and blunt end factors, were inspected to see whether they deviate from a normal distribution. This was done with help of QQ and stem and leaf plots, which revealed that the data approached a normal distribution with minor skewness. Identified outliers were evaluated on two criteria, namely whether they deviated more than four standard deviations from the mean and whether their absence or presence would induce a large change in the results. For most outliers that deviated more than four standard deviation, the presence or absence did not induce a large or significant change. However, one participant who read texts with blunt end blaming at the end and without sharp ends was removed due to extremely low values that were listed as outliers in several dependent variables.

Recall of the different disaster stories

The averaged recall scores of all possible elements across the three disasters were very similar, with participants recalling on average 52.7% (*SD* = 15.91) of the ICE Disaster elements, 54.8% (*SD* = 12.78) of the Kiss Nightclub Disaster elements, and 51.1% (*SD* = 14.58) of the 'The Who' Concert Disaster elements. Based on these results, no distinctions were made between the disasters in the following parts as they were treated as replications of each other.

Hypotheses recall (1-9)

Sharp end recall

Regarding sharp end recall, a significant main effect of time was found [$F(1.55, 63.50) = 32.10$, $p = .000$], with a large effect size (*partial* $\eta^2 = .44$), with the recall dropping from immediate recall ($M = .78$, $SD = .15$) to one week delayed recall ($M = .65$, $SD = .18$) and stabilizing with three weeks delayed recall ($M = .63$, $SD = .20$).

The first hypothesis was that the recall of sharp ends will be higher for participants who read texts without blunt end blaming at the end than for participants who read texts with blunt end blaming at the end. With the factorial ANOVA test of between-subjects effects, a statistically significant difference of sharp end recall in terms of blunt end blaming was found [$F(1, 41) = 4.66$, $p = .037$] with a medium to large effect size (*partial* $\eta^2 = .10$). In other words, the recall of sharp ends was significantly higher for participants who read texts without blunt end blaming at the end

(*M* = .74, *SD* = .15) than for participants who read texts with blunt end blaming at the end (*M* = .63, *SD* = .16). Therefore, the first hypothesis is accepted.

Sharp end recall over the weeks

With the second hypothesis, it was explored whether sharp end recall changes over time with blunt end blaming presence or absence. According to the repeated measures ANOVA with a Greenhouse-Geisser correction, no statistically significant interaction effect was found, see Table 3. Thus, the effect of blunt end blaming presence or absence on sharp end recall stays the same over the three weeks. Therefore, the second hypothesis is rejected.

Table 3

Means and standard deviations of sharp end recall per manipulation from the factorial repeated measures ANOVA of between-subject effects

		Sharp end recall								
		Immediate		One week delayed		Three weeks delayed				
		M	*SD*	*M*	*SD*	*M*	*SD*	*F*	*p*	*Partial* η^2
Blunt end blaming	Present	.73	.14	.60	.18	.58	.20	0.04	.933	.00
	Absent	.82	.13	.70	.16	.69	.20			

Sharp end order recall

On average, the disaster stories had a total length of 28 sentences. For the sharp end and blunt end order recall, the values could range between 0-27 sentences, with a large positive value indicating that the causes were recalled much later in the participant's text than the original order and vice versa. The third hypothesis was that the recall order of sharp ends will differ between participants who read texts with blunt end blaming at the end and participants who read texts without blunt end blaming at the end. With the factorial ANOVA test of between-subject effect, no statistically significant difference of sharp end recall order in terms of blunt end blaming was found [$F(1, 41) = 0.56$, $p = .461$] with a small effect size (*partial* $\eta^2 = .01$). In other words, the

order of recalled blunt ends was not affected by whether there was blunt end blaming towards the blunt end factors present (M = -0.24, SD = 0.89) or absent (M = -0.03, SD = 0.96) in the original disaster stories. Therefore, the third hypothesis is rejected.

Blunt end recall

Regarding blunt end recall, a significant main effect of time was found [$F(1.69, 133.79) = 103.26$, $p = .000$], with a large effect size (*partial* $\eta^2 = .57$), with the recall dropping from immediate recall (M = .53, SD = .18) to one week delayed recall (M = .38, SD = .18) and stabilizing with three weeks delayed recall (M = .35, SD =.18).

The fourth hypothesis was that participants who read texts without sharp ends will recall more blunt ends than participants who read texts with sharp ends. With the factorial ANOVA test of between-subject effects, no statistically significant difference of blunt end recall in terms of number of sharp ends was found [$F(1,79) = 2.77$, p=.100] with a small to medium effect size (*partial* $\eta^2 = .03$). In other words, the recall of blunt ends was not affected by whether sharp end factors were present (M = .39, SD = .18) or absent (M = .45, SD = .14) in the original disaster stories that participants read in the first session, see Table 4. Therefore, the fourth hypothesis is rejected.

The fifth hypothesis was that the recall of blunt ends will be higher for participants who read texts with blunt end blaming at the end than for participants who read texts without blunt end blaming at the end. With the factorial ANOVA test of between-subjects effects, a statistically significant difference of blunt end recall in terms of blunt end blaming was found [$F(1, 79) = 3.96$, p=.050] with a small to medium effect size (*partial* $\eta^2 = .05$). In other words, the recall of blunt ends was affected by whether there was blunt end blaming mentioned or not in the original disaster stories. Contrary to our hypothesis, it was found that participants who read texts without blunt end blaming at the end recalled significantly more blunt ends on average (M = .46, SD = .16) than participants who read texts with blunt end blaming at the end (M = .38, SD = .16), see Table 4. Therefore, the fifth hypothesis is rejected.

Table 4

Means and standard deviations of blunt end recall in percentages per condition

		Blunt end recall	
		M	*SD*
Sharp ends	Present	.39	.18
	Absent	.45	.14
Blunt end blaming	Present	.38	.16
	Absent	.46	.16

Blunt end recall over the weeks

With the sixth hypothesis, it was explored whether blunt end recall changes over time with sharp end presence or absence. With the seventh hypothesis, it was explored whether blunt end recall changes over time with blunt end blaming presence or absence. According to the repeated measures ANOVA's with a Greenhouse-Geisser correction, no statistically significant interaction effect was found, see Table 5. Thus, the effect of number of sharp ends, as well as blunt end blaming presence or absence on blunt end recall, stays the same over the three weeks. Therefore, both hypotheses six and seven are rejected.

Table 5

Means and standard deviations of blunt end recall per manipulation from the factorial repeated measures ANOVA of between-subject effects

		Blunt end recall (over time)								
		Immediate		One week delayed		Three weeks delayed				
		M	*SD*	*M*	*SD*	*M*	*SD*	*F*	*p*	*Partial* η^2
Sharp ends	Present	.50	.20	.35	.42	.33	.19	0.10	.873	.00
	Absent	.56	.16	.19	.15	.38	.16			
Blunt end blaming	Present	.49	.18	.35	.18	.31	.17	0.53	.592	.01
	Absent	.56	.18	.41	.17	.40	.17			

Blunt end order recall

The eighth hypothesis was that the recall order of blunt ends will differ between participants who read texts with sharp ends and participants who read texts without sharp ends. The ninth hypothesis was that the recall order of blunt ends will differ between participants who read texts with blunt end blaming at the end and participants who read texts without blunt end blaming at the end. As can be seen in Table 6, neither sharp ends nor blunt end blaming had a significant effect on the blunt end recall order. Therefore, both hypotheses eight and nine are rejected.

Table 6

Means and standard deviations of blunt end recall order per manipulation from the factorial ANOVA of between-subject effects

		Blunt end recall order				
		M	*SD*	*F*	*p*	*Partial* η^2
Sharp ends	Present	- 1.28	1.85	0.25	.246	.02
	Absent	- 0.76	2.02			
Blunt end blaming	Present	- 1.22	1.83	0.77	.384	.01
	Absent	- 0.85	2.05			

Note. The mean represents the averaged delta differences, thus how many sentences earlier (positive value) or later (negative value) the blunt ends were recalled compared to the original story order.

Hypotheses blaming tendency (10-13)

Assigned sharp end blame

The tenth hypothesis was that the assigned blame towards sharp end factors will be higher for participants who read texts with sharp ends than for participants who read texts without sharp ends. With the factorial ANOVA test of between-subject effect, a statistically significant difference of assigned sharp end blame in terms of number of sharp ends was found [$F(1, 79) = 15.75$, $p < .001$] with a large effect size (*partial* $\eta^2 = .17$). In other words, the assigned sharp end blame was significantly higher for participants who read texts with sharp ends ($M = 2.70$, $SD = 0.66$) than for

participants who read texts without sharp ends (M = 1.95 SD = 1.04), see Table 7. Therefore, the tenth hypothesis is accepted.

The eleventh hypothesis was that the assigned blame towards sharp end factors will be higher for participants who read texts without blunt end blaming at the end than for participants who read texts with blunt end blaming at the end. With the factorial ANOVA test of between-subject effect, a statistically significant difference of assigned sharp end blame in terms of blunt end blaming was found [$F(1, 79) = 4.025$, $p = .048$] with a small to medium effect size (*partial* $\eta^2 = .05$). In other words, the assigned sharp end blame was significantly higher for participants who read texts without blunt end blaming at the end (M = 2.52, SD = 0.96) than for participants who read texts with blunt end blaming (M = 2.15, SD = 0.88), see Table 7. Therefore, the eleventh hypothesis is accepted.

Table 7

Means and standard deviations of sharp end blame per condition

		Sharp end blame	
		M	*SD*
Sharp ends	Present	2.70	0.66
	Absent	1.95	1.04
Blunt end blaming	Present	2.15	0.88
	Absent	2.52	0.96

Note. The means can range from values 0-5. 0=not applicable, 1=not at all responsible, 2=slightly responsible, 3=moderately responsible, 4=very responsible, 5=extremely responsible.

Assigned blunt end blame

The twelfth hypothesis was that the assigned blame towards blunt end factors will be higher for participants who read texts without sharp ends than for participants who read texts with sharp ends. With the factorial ANOVA test of between-subject effect, a statistically significant difference of assigned blunt end blame in terms of number of sharp ends was found [$F(1, 79) = 4.83$, $p = .031$] with a small to medium effect size (*partial* $\eta^2 = .06$). In other words, the assigned blunt end blame was higher for participants who read texts without sharp ends (M = 4.01 SD = 0.61) than for

participants who read texts with sharp ends (M = 3.72, SD = 0.58), see Table 8. Therefore, the twelfth hypothesis is accepted.

The thirteenth hypothesis was that the assigned blame towards blunt end factors will be higher for participants who read texts with blunt end blaming at the end than for participants who read texts without blunt end blaming at the end. With the factorial ANOVA test of between-subject effect, no statistically significant difference of assigned blunt end blame in terms of blunt end blaming was found [$F(1, 79) = 0.66$, $p = .418$] with a small effect size (*partial* $\eta^2 = .00$). In other words, the assigned blunt end blame was not affected by whether there was blunt end blaming in the original disaster mentioned (M = 3.91, SD = 0.57) or not (M = 3.81, SD = 0.65), as can be seen in Table 8. Therefore, the thirteenth hypothesis is rejected.

Table 8

Means and standard deviations of sharp end blame per condition

		Blunt end blame	
		M	*SD*
Sharp ends	Present	3.72	0.58
	Absent	4.01	0.61
Blunt end blaming	Present	3.91	0.57
	Absent	3.81	0.65

Note. The means can range from values 0-5. 0=not applicable, 1=not at all responsible, 2=slightly responsible, 3=moderately responsible, 4=very responsible, 5=extremely responsible.

Hypotheses locus of control (14-17)

Locus of control

For the hypotheses regarding the locus of control, only the conditions with sharp ends present were included as these had both blunt end and sharp end factors included in their disasters (N = 43). The locus of control scores ranged between 2 and 21, with a mean of 11 (SD = 4.11). Cut off points for three groups (internal, external, both) were created with SPSS, namely scores from 2-9, 10-13, and 14-21. According to Rotter (1966), low scores indicate an internal locus of control and high scores an external locus of control. Therefore, the category 2-9 was classified as an

internal locus of control (*N* = 16), 14-21 as an external locus of control (*N* = 11) and 10-13 as both (*N* = 16) as it centered around the mean and indicated no clear preference. A one-way MANOVA was conducted to test for significant differences of locus of control on recall and assigned blame of sharp and blunt ends.

The fourteenth hypothesis was that there will be a difference in sharp end recall based on participant's locus of control. The fifteenth hypothesis was that there will be a difference in assigned blame towards sharp end factors based on participant's locus of control. As can be seen in Table 9 and Table 10, the locus of control did not have any statistically significant effects on either the recall or the assigned blame of sharp end factors. Therefore, both hypotheses fourteen and fifteen are rejected.

Table 9

Means and standard deviations of sharp end recall per locus of control from the factorial ANOVA of between-subject effects

	Sharp end recall				
	M	*SD*	*F*	*p*	*Partial* η^2
Both	.71	.16	0.46	.634	.02
External	.65	.16			
Internal	.69	.17			

Table 10

Means and standard deviations of sharp end blame per locus of control from the factorial ANOVA of between-subject effects

	Sharp end blame				
	M	*SD*	*F*	*p*	*Partial* η^2
Both	2.59	0.52	0.36	.698	.02
External	2.71	0.79			
Internal	2.90	0.72			

The sixteenth hypothesis was that there will be a difference in blunt end recall based on the participant's locus of control. The seventeenth hypothesis was that there will be a difference in the assigned blame towards blunt end factors based on the participant's locus of control. As can be seen in Table 11 and Table 12, locus of control did not have any statistically significant effects on either the recall or the assigned blame of blunt end factors. Therefore, both hypotheses sixteen and seventeen are rejected.

Table 11

Means and standard deviations of blunt end recall per locus of control from the factorial ANOVA of between-subject effects

	Blunt end recall				
	M	*SD*	*F*	*p*	*Partial* η^2
Both	.41	.24	0.70	.505	.03
External	.34	.14			
Internal	.42	.14			

Table 12

Means and standard deviations of blunt end blame per locus of control from the factorial ANOVA of between-subject effects

	Blunt end blame				
	M	*SD*	*F*	*p*	*Partial* η^2
Both	3.71	0.63	0.21	.815	.01
External	3.82	0.39			
Internal	3.67	0.67			

Post hoc test

As the research question centers around the sharp end effect and blunt end blaming, two paired sample t-tests were conducted to investigate whether the sharp end effect was still present with the manipulation of blunt end blaming. A positive correlation between sharp end and blunt end recall (r = .67, p = .001) and sharp end and blunt end blame (r = .38, p = .012) was found for

participants who read texts without blunt end blaming at the end. Furthermore, participants who read texts without blunt end blaming at the end recalled significantly more sharp ends (M = .74) than blunt ends (M = .46, t_{21} = 10.38, p < .001), see Figure 2. However, participants who read texts without blunt end blaming assigned on average significantly more blame to blunt ends (M = 3.91) than sharp ends (M = 2.52, t_{42} = -9.07, p < .001), see Figure 3. For participants who read texts with blunt end blaming at the end, a positive correlation between sharp end and blunt end blame was found (r = .34, p = .032). Additionally, participants who read texts with blunt end blaming at the end also recalled significantly more sharp ends (M = .63) than blunt ends (M = .38, t_{20} = 5.82, p < .001), see Figure 2. Participants who read texts with blunt end blaming also assigned on average significantly more blame to blunt ends (M = 3.81) than sharp ends (M = 2.15, t_{42} = -12.80, p < .001), see Figure 3. Thus, the sharp end effect was still present in terms of recall, regardless of blunt end blaming presence or absence and was only slightly lower with blunt end blaming present. Additionally, a blunt end effect in terms of blaming was found regardless of blunt end blaming presence or absence and was higher with blunt end blaming present.

Figure 2

Comparison of sharp end recall and blunt end recall per blunt end blaming condition

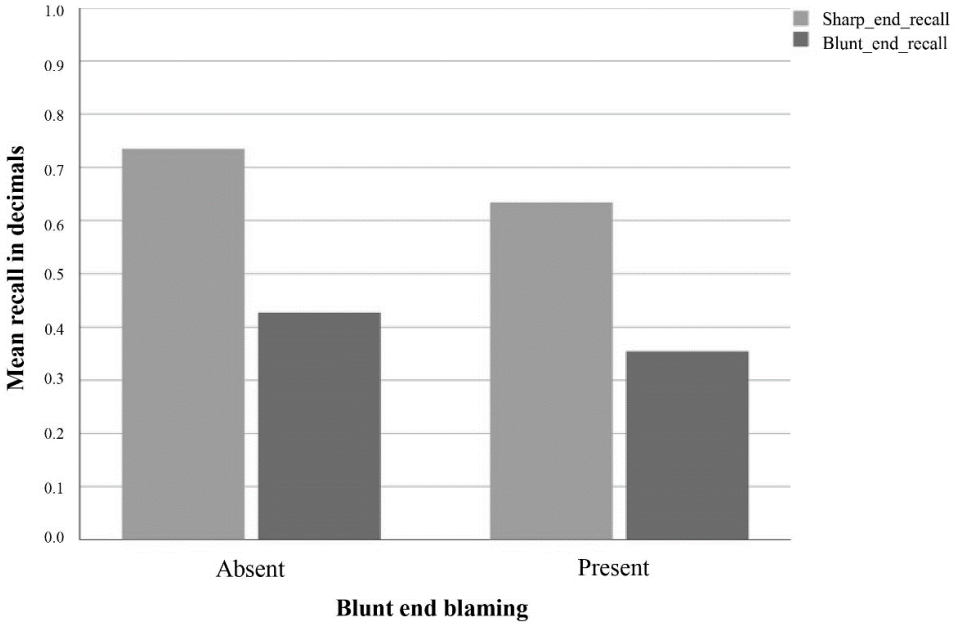
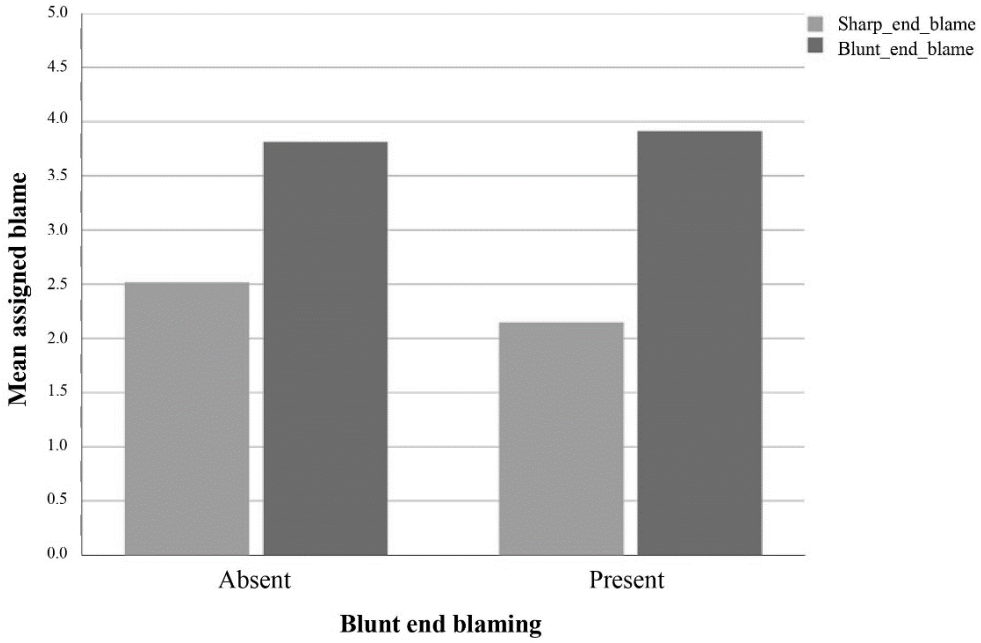


Figure 3

Comparison of blaming towards sharp end and blunt end per blunt end blaming condition



Discussion

The purpose of this study was to investigate possible explanations for the sharp end effect, more specifically, that more sharp end factors will be recalled than blunt end factors, based upon preliminary findings by Moning (2014). Additionally, it was also tested whether the sharp end effect follows a similar pattern in the assignment of blame to sharp end and blunt end factors. The four conditions of the experiment were created based on two manipulations, namely sharp end presence or absence and blunt end blaming presence or absence. Contrary to the initial assumptions of the researcher, it was found that recall and blaming tendency follow different patterns and may therefore be considered as separate processes. It was shown that participants recalled more sharp end factors, but assigned more blame to blunt end factors on average.

Starting with the recall of the disaster stories, sharp ends were recalled more by participants than blunt ends which replicates the sharp end effect of Moning (2014). In the study of Moning (2014), the number of sharp ends and blunt ends varied across the different stories and a consistent sharp end effect was shown regardless of the number of sharp ends and blunt ends. In the current

study, it was shown that the sharp end effect was still present when the number of sharp ends and blunt ends in the stories were balanced and regardless of whether blunt end blaming was mentioned or not. The results may be explained with the help of the reductive tendency of Feltovich et al. (2004), namely that people oversimplify the complexity of disasters by focusing on the factors that are easier to understand, in this case, the sharp end factors. It could be the case that sharp ends are recalled better simply due to their characteristics, namely being temporally and spatially close to the disaster itself. In contrast, blunt end factors are usually more abstract and further away (see Hollnagel, 2002), both spatially and temporally from the disaster, resulting in a reduction in causes due to oversimplification. Support for this was found in the current experiment as the removal of sharp ends did not result in a significant increase in the recall of blunt ends. The sharp end factors in all three disasters were both temporally close to and influenced the outcome of the disaster.

Against the initial expectations of the researcher, adding blunt end blaming to the end of stories had a negative effect on both sharp end and blunt end recall instead of a positive one. This effect may be explained by a memory phenomenon, namely that the addition of blunt end blaming at the end of a story resulted in a recency effect. In fact, research on long-term memory has shown that people usually remember information near the end of texts better than the information that they read earlier (Copeland, Radvansky & Goodwin, 2009). As both sharp end and blunt ends were mentioned in the intermediate parts of the stories, it could be that the judgmental sentence at the end caught the reader's attention and thus resulted in forgetting more information about the intermediate part.

Concerning the recall order, the results show that sharp ends and blunt ends were recalled in a similar order to the original order regardless of the two manipulations. These results could mean that the differences were so small because the story structure of the disaster matched the expectations of participants about the flow of disasters, even when sharp ends were completely removed from the stories. Thus, people likely remember sharp ends and blunt ends in the order in which they read them rather than completely reconstructing the stories over the weeks. The research of Mandler and Johnson (1977), Moning (2014) and Thorndyke (1977) have shown that the presence of story grammar increases the recall of the texts' elements. One additional, unexplored effect could be that the presence of story grammar does not only have a positive effect on recall but also on the recall order of texts since texts that include story grammar conform to an ideal structure. Thus, one explanation for these results could be that the story grammar, which was

created by authors from scientific and non-scientific publications, conformed closely with the ideal structure of a disaster report. In turn, this would also explain why there was no interaction effect of the number of sharp ends or blunt end blaming on the sharp end and blunt end recall order over the weeks.

The blaming tendency towards sharp end and blunt end factors can be explained by that people only assign blame to factors that they read. This is supported by the research of Anderson, Krull, & Weiner (1996) and Zaller (1992), namely that participants likely assigned more blame to sharp ends when they were present as it seems more plausible to them than if they were absent in the original text. However, when looking at the results, it is interesting to note that participants still assigned at least some blame to sharp end factors even when they were not mentioned in the disasters. On the one hand, research by Glick (2005) supports the finding that adding blunt end blaming towards the blunt end to the text resulted in a decreased blaming of sharp end factors. This likely happened because sharp end factors are then seen as nonviable scapegoats compared to blunt end factors. On the other hand, the addition of blunt end blaming did not result in increased blaming of blunt end factors, thus the research by Glick (2005) also contradicts the current results. Against the initial assumptions of the researcher, the addition of blunt end blaming at the end of the story did not result in participants perceiving the blunt end factors as more viable scapegoats than when blunt end blaming was not added.

The results regarding the locus of control contradict the initial assumptions that locus of control will have an impact on the recall and blaming of sharp ends and blunt ends. Even though the locus of control was different across the participants, it was not associated in any way with different levels of recall or blame assignment.

Interestingly, against initial assumptions, a strong blunt end effect in terms of blaming tendency was shown regardless of both the number of sharp ends and blunt end blaming. With the sharp end effect in terms of recall and the blunt end effect in terms of blaming tendency, evidence for a cross-over effect was found. More specifically, the recall was only influenced by the presence of blunt end blaming at the end and the blaming tendency was only influenced by the presence of sharp ends in the story. Taking a step further, these unexpected findings may be in line with dual-process theory (Kahneman, 2003), which proposes that thoughts arise through two different types of processes. One process is rather implicit and automatic, also called system 1, while the other process is more explicit and controlled, also called system 2. The processes of recall and blaming

tendency were shown to be separate processes, each influenced by different factors. More specifically, we speculate that recall may be considered as a more effortful and attention-demanding process, thus system 2, as participants had to read and internalize information from disaster stories. In turn, the blaming tendency may be considered a rather associative and relatively automatic process, thus system 1, as blaming was shown to be a habit and also difficult to control or modify as it is an inherent desire of humans. On the one hand, these results contradict the initial assumption of the socially regulated blaming perspective that recall and blaming tendency underlie connected processes. On the other hand, the results provide support for the motivated blame model since participants gave blunt end factors always the blame, regardless of blunt end blaming, but recalled sharp end factors better than blunt end factors.

Limitations

One limitation of the current study is that since all factors were presented to the participants at once per responsibility question, there could be a possible confounding effect that participants weighed the factors against each other. Thus, they may have changed their first impression when being presented with all factors at once. No clear conclusions can be drawn about whether the reported blunt end effect in terms of blaming happened due to an initial blaming tendency of people or simply due to the setup of the questions. However, due to the large number of factors in the current experiment, presenting the factors one by one would have likely resulted in boredom and less attention being paid to the answers given to the last factors in the sequence.

Another possible limitation is that the disaster stories indirectly pointed to the blunt end which would explain why a blunt end effect in terms of blaming occurs. The blame towards blunt ends was in all conditions higher than the blame towards sharp ends regardless of the manipulations, which appeared unexpectedly. One possible reason for this could be the characteristics of the sample, as they were young adults with a high education level. Students learn in their study programs to think critically and see the wider picture of a situation, therefore, it could be that the blunt end blaming effect is due to the critical thinking skills students are practiced in.

Additionally, most of the blunt ends were quite concretely formulated and therefore may be said to have included factors at the meso-level but not the macro-level, which does not completely capture the prototypicality of blunt ends. Usually, many blunt ends are more abstract such as legislation or managerial factors, which was not the case in this study. However, the

concreteness of blunt ends did not seem to have played a larger role in the current experiment as sharp ends were also concretely formulated and did not receive as much blame as blunt ends.

Another possible limitation is that the concept of locus of control was in hindsight not fully applicable to the current study, as it circles around whether the person assigns the control of events to oneself or external factors (Rotter, 1966). In the current study, participants read about disasters that they did not experience themselves. Therefore, it cannot be concluded with certainty that locus of control has no effect at all on the recall or blaming tendency of sharp ends and blunt ends. As there is no literature available on the connection between locus of control and recall, these exploratory results provided some first insights on a possible connection.

Lastly, it still remains unclear why the sharp end effect occurs as it has been replicated in the current study even with several manipulations and measurements. In the current study, the disaster stories were kept as close to the original articles as possible. Therefore, the different disasters were not constructed in the same way, which can be seen as a possible limitation as well. It seems to be the case that the sharp end effect occurs only in terms of recall processes. As the current study did not control for the structure of the disasters and did not find conclusive results about the causes of the sharp end effect, no firm conclusions can be drawn. However, as no effect of story grammar on the sharp end and blunt end recall was found before (see Moning, 2014), the uncontrolled story structure could not have played a major role in the sharp end effect.

Future research

To investigate whether the blunt end effect in terms of blaming would still occur, the responsibility questions should be split and presented to participants one after the other. Through that, participants would only remember the factor that they just read, but they would not know what the upcoming factor or question will be. With this setting, it can be investigated whether the blunt end effect is still present and if so, it would provide support for a blunt end blaming tendency. Additionally, as judgments of cause and blame are distinct concepts (Lagnado & Channon, 2008), a question about the judgment of cause could be added to make a more in-depth distinction between who participants see as blameworthy and who they consider having caused the disaster. The methodology created in the current study, namely balancing the different disaster stories across variables such sharp ends and blunt ends or other formal arrangements such as readability can be used by other researchers for future investigations on disaster recall.

Furthermore, the disasters themselves should be formulated more ambiguously by formulating blunt ends more abstractly to make them more prototypical. The spatial and temporal closeness of sharp ends will be difficult to manipulate in themselves. However, it could be investigated whether the recall of sharp ends and blunt ends changes when disasters are written in chronological order. To gain more insight into the memory phenomenon of the sharp end effect, it would also be interesting for future research to investigate how and whether recall for contextual elements changes.

Furthermore, the characteristics of the sample should be extended, including a wider age and education level span. If the current results can be replicated with samples differing in age and educational level, it would provide the support that the sharp end effect in terms of recall and the blunt end effect in terms of blaming is a more or less universal phenomenon in humans.

Also, several ambiguities should be removed in a future experiment. For instance, one should add to the responsibility questions that participants should assign responsibility to the factors that they recognize of the text. In turn, this would avoid that participants feel the need to answer even if recognizing that factor was not mentioned in the disaster. It would also confirm once more, if all participants answer honestly, what sharp end and blunt end factors the participants remember. Also, the description of the foreknowledge questions could be changed by writing them more reassuringly. For instance, it could be added that it is not a problem if the participant does not know the answers to these questions as these are merely about foreknowledge and are distinctive from and are not counted within the actual experiment.

Another possibility to prepare participants for the duration of the study would be to make use of some kind of deception. This would ensure that participants are informed of the length of the study but mislead them in terms of content so that they cannot prepare for the free recall questions or tasks after the first session.

If testing implicit memory, the ‘not applicable’ button or any option that participants could click, should be made visually distinctive or may be placed on the very left side of the answer options. Another possibility would be that if it is not possible with a vertical line, to maybe make that option in a different color so that participants do not choose the option by accident.

In the current research, it has been shown that blunt end blaming decreases assigned blame towards sharp end factors. For future research it would be interesting to see whether this effect can be reversed, thus if adding sharp end blaming would decrease assigned blame towards blunt end

factors. If charges towards blunt ends or sharp ends are named, these should be mentioned in the intermediate part of the disaster to avoid the recency effect that was found in the current study.

Furthermore, the reading behavior of participants could be investigated in the future, thus what and how participants read the disaster stories. On the one hand, this could be accomplished, for instance, by a think-aloud method where participants have to read one sentence at a time, summarize the content in their own words after each sentence, and state who they find blameworthy. In turn, this would give more insight into how the participants understand the text and how their blaming tendency develops throughout the text. On the other hand, advanced technologies such as eye-tracking could be used to investigate participants' gazes of the disaster stories and which part of the text they paid most attention to. This would give more insight into the rather unconscious reading processes of the reader and which parts caught their attention.

Practical Implications

To avoid a recency effect and loss of memory, articles or disasters written by newspapers should avoid putting strong statements at the ending of a text even though it may be common to name the charges at the very end. Regarding the content of disaster stories, newspapers should try to reduce the number of sharp end factors as much as possible to minimize sharp end blaming. It is very unlikely that readers can comprehend disaster stories when no sharp end factors are mentioned at all, however, they should be kept at a minimum and as abstract as possible. Another possibility to reduce sharp end blaming is to integrate blunt end blaming into the disaster stories as much as is applicable in the respective case.

If the blunt end effect in terms of blaming can be repeatedly found, this would change the perspective on who people are blaming for a disaster. It would change the whole notion of a blame culture that gives the blame to a concrete person to a blame culture that actually blames the more indirect, managerial factors or influences.

Since it has been shown that media makes usage of framing and visual images (Druckman, 2001; Haider-Markel & Joslyn, 2001; Iyengar, 1991; Scheufele, 1999), they should try to highlight the importance of blunt end factors in a disaster to provide a full picture but also to motivate readers to think more critically about the event. This could be done by writing news titles or headers in a way that points towards the blunt end factors and less to the sharp end factors. Another possibility would be to show the complexity, causes of and influences on the disaster in a graphic since it will

more likely catch a reader's attention and provide a complete picture. One example of such visualization can be found in Appendix H.

Conclusion

In conclusion, the sharp end effect that was found in Moning (2014) and the current study cannot be explained by the presence or absence of blunt end blaming nor sharp ends. Besides, no evidence was found that the locus of control of a person influences the recall of or blaming tendency towards sharp end and blunt end factors. Thus, the research question of what causes the sharp end effect cannot be clearly answered on the basis of the current findings. In the current study, it was shown that blunt end blaming had overall an unexpected negative effect on sharp end as well as blunt end recall. In contrast, a strong blunt end effect in terms of blaming tendency was found, where the blaming towards sharp ends could be reduced by blunt end blaming and sharp end absence.

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Appendices

Appendix A: Questions for inclusion and/or exclusion of participants

In the following, a few general questions about your knowledge of the different disasters/accidents will be asked. If you do not know the answer to the questions, please indicate so. If you have a vague idea about the disaster/accident, please write it down as well.

ICE Disaster nearby Hanover

What happened during the ICE Disaster nearby Hanover?

_____

Do you have any additional information about the ICE Disaster nearby Hanover?

_____

Kiss Nightclub Disaster

What happened during the Kiss Nightclub Disaster?

_____

Do you have any additional information about the Kiss Nightclub Disaster?

_____

The 'The Who' Concert Disaster

What happened during the ‘The Who’ Concert Disaster?

_____

Do you have any additional information about the 'The Who' Concert?

_____

How do you rate your ability to read short English texts or stories?

Very bad o o o o o o o Very good

Were/are you part of a study program that was/is taught in English at a university or university of applied sciences?

- o Yes
- o Yes, but only temporary
- o No

Please answer the following questions honestly. It is not a problem if the questions apply to you, as they only serve for the further analysis to deliver truthful results.

Now that you have read all three disasters, did you recognize one (or several) of them?

- o Yes, namely _____
- o No

Did you acquire any additional information about any of the disasters while the experiment was ongoing (e.g. conversation, internet search, books, notes, etc.)?

- o Yes, namely _____
- o No

Appendix B: Informed consent

Welcome!

Thank you already in advance for participating in the experiment today. The experiment should take around 45 minutes in total to complete. In the experiment, you will read three short stories sequentially about different accidents or disasters, solve verbally several calculation tasks after each story and then write down everything you remembered of the story. If you do have any questions before, during, or after the experiment, feel free to ask them, the researcher will be present during the whole experiment.

There are no right or wrong answers to any of the tasks or questions. Please be assured that your responses will be kept completely confidential. If your research results are to be used in scientific publications or made public in any other manner, then they will be made completely anonymous. Your personal data will not be disclosed to third parties without your express permission. Your participation in this research is voluntary. You have the right to withdraw this consent at any time during the experiment and without the need to give any reason. If you request further information about the research, now or in the future, you may contact Lea Berkemeier, l.berkemeier@student.utwente.nl.

If you have any complaints about this research, please direct them to the secretary of the Ethics Committee of the Faculty of Behavioural, Management and Social Sciences at the University of Twente, Drs. L. Kamphuis-Blikman P.O. Box 217, 7500 AE Enschede (NL), telephone: +31 (0)53 489 3399; email: l.j.m.blikman@utwente.nl).

By clicking the button below, you acknowledge that your participation in the study is voluntary, that you are at least 18 years old, and that you are aware that you may choose to terminate your participation in the study at any time and for any reason.

- I consent, begin the experiment
- I do not consent, I do not wish to participate

Appendix C: Sources for the different disaster stories

ICE Disaster nearby Hanover

1. https://ec.europa.eu/echo/files/civil_protection/civil/act_prog_rep/crisis_communication_en.pdf
2. https://www.dw.com/en/eschede-germanys-worst-train-disaster-remembered-20-years-on/a-44056391
3. https://en.wikipedia.org/wiki/Eschede_derailment
4. https://nsc.nasa.gov/docs/default-source/system-failure-case-studies/sfcs-2007-05-01-eschedetraindisaster.pdf?sfvrsn=4240ecf8_2
5. https://www.sciencedirect.com/science/article/pii/S1350630704000214?casa_token=ydEmMP3hxSkAAAAA:SxXkUbe55igeQPD2qHg3IFRX-Gkk3y3kijjJNm4XRgjAjmVaL4Llq1d33MWtxbb9YFai_YLas7o
6. https://journals.lww.com/jorthotrauma/fulltext/2000/05000/facts_about_the_disaster_at_eschede.11.aspx?casa_token=CtO2YpghNTQAAAAA:2LztqO1I1xKkaepNo0ECTY1LHKG-wTR2ejG31GmQITTlzyv18Z9do6_zN6c62kkiFGOlQq1T9o8qSQahqDiwXxa7yqJJQw
7. http://jpsra.am.gdynia.pl/upload/SSARS2015PDF/Vol3/JPSRA2015-3-vanKleef.pdf
8. https://link.springer.com/chapter/10.1007/978-3-319-94476-0_18
9. https://sma.nasa.gov/docs/default-source/safety-messages/safetymessage-2007-05-01-eschedetraindisaster-vits.pdf?sfvrsn=aea91ef8_6
10. https://en.wikipedia.org/wiki/Eschede_derailment

Kiss Nightclub Disaster

1. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3741004/
2. https://pubmed.ncbi.nlm.nih.gov/25544145/
3. https://www.sciencedirect.com/science/article/pii/S0305417916302881
4. https://collective-dynamics.eu/index.php/cod/article/viewFile/A12/16
5. https://lib.ugent.be/fulltxt/RUG01/002/494/950/RUG01-002494950_2018_0001_AC.pdf
6. https://en.wikipedia.org/wiki/Kiss_nightclub_fire
7. https://www.bbc.com/news/world-latin-america-23764662
8. https://agenciabrasil.ebc.com.br/en/geral/noticia/2016-01/safter-three-years-kiss-nightclub-fire-has-no-convict-nor-family-compensation

9. https://edition.cnn.com/2013/01/28/world/americas/brazil-nightclub-fire/index.html
10. https://placeandsee.com/wiki/kiss-nightclub-fire

‘The Who’ Concert Disaster

1. https://en.wikipedia.org/wiki/The_Who_concert_disaster
2. https://www.rollingstone.com/feature/rock-roll-tragedy-why-11-died-at-the-whos-cincinnati-concert-93437/
3. https://www.cheatsheet.com/entertainment/the-who-concert-disaster-what-happened-at-the-bands-tragic-1979-cincinnati-show.html/
4. https://www.wcpo.com/news/the-who-the-night-that-changed-rock/the-who-concert-40-years-later-survivors-and-victims-families-relive-tragic-night-in-cincinnati
5. https://eu.usatoday.com/story/entertainment/music/2019/12/03/the-who-concert-stampede-11-dead-cincinnati-40-years-ago/2594737001/
6. https://link.springer.com/chapter/10.1007/978-3-642-04504-2_28
7. https://www.researchgate.net/profile/Kamalakar_Karlapalem/publication/273067751_Crowd_Congestion_and_Stampede_Management_through_Multi_Robotic_Agents/links/553a61300cf245bdd7642354.pdf
8. https://arxiv.org/pdf/2101.02250.pdf
9. https://curve.carleton.ca/system/files/etd/89e798fc-16e5-47a1-b5f6-323cfc50460a/etd_pdf/a5f516d49f1ddc91e467af8520c098c1/henein-crowdsaremadeofpeoplehumanfactorsinmicroscopic.pdf
10. https://link.springer.com/chapter/10.1007/978-3-030-50371-0_38

Appendix D: Disaster stories

For determining the concreteness and abstractness levels of each disaster story, each word has been categorized with help of a validated word list (Brysbaert, Warriner & Kuperman, 2014). Brysbaert, Warriner and Kuperman (2014) created three categories, namely abstract words (scores between 1.0-2.9), slightly more abstract words (scores between 3.0-3.9) and concrete words (scores between 4.0-5.0). To put all words into different categories, an additional category has been created for words that were not mentioned in the validated list, such as date, year, names or cities. After each word of a text has been categorized, the relative percentages per category were calculated by dividing the number of words of the category by the total number of words from the disaster.

Sharp ends

Blunt ends

Contextual information

Blunt end blaming

ICE Disaster nearby Hanover [1]

Version: 4 Blunt Ends, 4 Sharp Ends; Blunt End Blaming [302 words]

In 1998, hundreds of people had been traveling onboard the ICE of Deutsche Bahn*. Shortly after the stop in Hanover, the tire of a wheel broke at a high speed and punctured the floor. The train conductor noticed some vibrations but did not consider them severe. Two passengers from the first wagon noticed that a piece of the cracked wheel came up through the floor. One of the two passengers was completely in shock while the other one went to report the damage to the train crew. According to the Deutsche Bahn policies, an emergency stop was only allowed after visual inspection by the train manager. Precious time elapsed by insisting on investigating the damage before stopping the train. In the meantime, the broken wheel rim slammed against the guard rail of the next switch point. The switch point was close to an overpass bridge, pulling it away from the railway track. Shortly after, the back part of the train was being slammed against the road bridge. The bridge collapsed, burying parts of the train underneath it. Over one hundred people died or were injured, some critically. The failure was traced back to the poor design and

insufficient testing of Deutsche Bahn because the wheel design decisions were only based on analysis and theory. Additionally, Deutsche Bahn did not replace the wheels on time, even though they knew they were being worn below the recommended standard in diameter. Furthermore, the flawed and ineffective emergency operation procedures of Deutsche Bahn contributed to the disaster as well. Lastly, the inconsiderate placement of the switch, an inherent hazard for high-speed trains, at the overpass bridge, contributed to the severity of the disaster. Several Deutsche Bahn officials were charged with manslaughter. The train manager was cleared of all charges. He only complied with the company's policies.

*Deutsche Bahn is a German railway company

Flesch reading ease score: 63

Concrete words: 16.6%

Slightly more abstract words: 20.5%

Abstract words: 57.9%

Not in list: 5.0%

Kiss Nightclub Disaster [2]

Version: 4 Blunt Ends, 4 Sharp Ends; Blunt End Blaming [326 words]

In 2013, a major fire occurred at the Kiss nightclub in the city of Santa Maria, Southern Brazil. Against the club's capacity, it was packed with at least one thousand people. The security guards let all people in who already paid for their ticket ahead. The fire started during the night. A band performing at the club let off fireworks meant for outdoor use. They did not buy the more expensive indoor fireworks. It resulted in the cheap material of the club's ceiling getting ignited. Due to a malfunctioning fire extinguisher, the blaze spread throughout the packed club at lightning speed. Thick, toxic smoke got emitted. Those inside panicked as they tried to get out, but the security guards did not let them out. The security guards could not directly evaluate the situation's severity inside. According to the club's regulation, they only let people out who paid for their drinks. The toxic smoke made the barkeeper and audience lose their sense of direction. The barkeeper started

pointing people towards the emergency exit. However, the people apparently confused the bathroom doors with the exit door. The club had poor, inflammable insulating foam material in the ceiling and faulty fire safety equipment. It had neither an alarm nor a sprinkler system. Furthermore, the poorly designed club had only one emergency exit. Moreover, metal barriers used to keep people in line on their way inside were inconsiderately placed. They ended up blocking people from getting out. Once the security guards realized how serious the fire was, they tried to help people escape. Additionally, firefighters had to open a hole in the outer wall to allow more people to escape. Hundreds of youngsters were killed or hospitalized for smoke inhalation and burns. Dozens of them were in critical condition. The two nightclub owners were charged with manslaughter. However, the security guards were cleared of all charges due to the complexity of the situation. They only complied with the club's regulations.

Flesch reading ease score: 57

Concrete words: 23.6%

Slightly more abstract words: 17.5%

Abstract words: 57.1%

Not in list: 1.8%

<u>The Who Concert Disaster [3]</u>

Version: 4 Blunt Ends, 4 Sharp Ends; Blunt End Blaming [343 words]

In 1979, the band 'The Who' performed at the Riverfront Coliseum as part of their world tour. It was a sold-out show, with the majority of the tickets sold as unassigned or general-assignment seating. The event managers inconsiderately chose for this type of seating as they never experienced problems with it at previous concerts. According to news reports at the time, the doors were expected to open at 7 p.m. Thousands of people outside grew restless when they heard members of 'The Who' performing their soundcheck. Inside the coliseum, the security staff and ticket takers were short-staffed. This was due to the ill-conceived change of shifts by the event managers. They decided to only open a pair of doors at the far right of the main entrance to handle the crowd. However, through the soundcheck and the closed doors, the large crowd of

fans started to turn into a panicked stampede. No well-thought-out management plans of the large crowd were created ahead. At first, the police officers on the outside did not spot any immediate problems in the crowd. Therefore, they decided to not intervene. The police mistakenly did not have any legal authority to order the doors to get open, because the coliseum was privately owned at that time. People at the back of the crowd started pushing forward, trapping the people in front and pushing them to the ground. After some time has passed, the police started to work their way into the crowd. They found several dead concertgoers on the ground, which have not been able to breathe. With only a small part of the crowd getting inside, the band started playing their concert. Their band manager hid from them what happened on the outside until after the show. Some people died since they were not able to breathe and a lot of people were injured during the stampede. Furthermore, first-come, first-served ticket sales have been banned. Both event managers were charged with manslaughter. The involved police officers were cleared of all charges due to the complexity of the situation.

Flesch reading ease score: 69

Concrete words: 15.7%

Slightly more abstract words: 17.5%

Abstract words: 62.4%

Not in list: 4.4%

Sharp ends

Blunt ends

Contextual information

ICE Disaster nearby Hanover [1]

Version: 4 Blunt Ends, 4 Sharp Ends; No Blunt End Blaming [297 words]

In 1998, hundreds of people had been traveling onboard the ICE of Deutsche Bahn*. Shortly after the stop in Hanover, the tire of a wheel broke at a high speed and punctured the floor. The train conductor noticed some vibrations but did not consider them severe. Two passengers from

the first wagon noticed that a piece of the cracked wheel came up through the floor. One of the two passengers was completely in shock while the other one went to report the damage to the train crew. According to the Deutsche Bahn policies, an emergency stop was only allowed after visual inspection by the train manager. Precious time elapsed by insisting on investigating the damage before stopping the train. In the meantime, the broken wheel rim slammed against the guard rail of the next switch point. The switch point was close to an overpass bridge, pulling it away from the railway track. Shortly after, the back part of the train was being slammed against the road bridge. The bridge collapsed, burying parts of the train underneath it. Of the train's twelve wagons, most were either derailed, torn in half next to the bridge, or were crushed into the bridge by the back engine. Over one hundred people died or were injured, some critically. The failure was traced back to the design and testing of Deutsche Bahn because the wheel design decisions were only based on analysis and theory. Additionally, Deutsche Bahn did not replace the wheels on time, even though they were being worn below the recommended standard in diameter. Furthermore, the emergency operation procedures of Deutsche Bahn contributed to the disaster as well. Lastly, the placement of the switch, an inherent hazard for high-speed trains, at the overpass bridge, contributed to the severity of the disaster.

*Deutsche Bahn is a German railway company

Flesch reading ease score: 66

Concrete words: 18.5%

Slightly more abstract words: 21.2%

Abstract words: 55.9%

Not in list: 4.4%

<u>Kiss Nightclub Disaster [2]</u>

Version: 4 Blunt Ends, 4 Sharp Ends; No Blunt End Blaming [321 words]

In 2013, a major fire occurred at the Kiss nightclub in the city of Santa Maria, Southern Brazil. Against the club’s capacity, it was packed with at least one thousand people. The security guards

let all people in who already paid for their ticket ahead. The fire started during the night. A band performing at the club let off fireworks meant for outdoor use. They did not buy the more expensive indoor fireworks. It resulted in the club's ceiling getting ignited. Due to a malfunctioning fire extinguisher, the blaze spread throughout the packed club at lightning speed. Thick, toxic smoke got emitted. Those inside panicked as they tried to get out, but the security guards did not let them out. The security guards could not directly evaluate the situation's severity inside. According to the club's regulation, they only let people out who paid for their drinks. The toxic smoke made the barkeeper and audience lose their sense of direction. The barkeeper started pointing people towards the emergency exit. However, the people apparently confused the bathroom doors with the exit door. The club had inflammable insulating foam material in the ceiling and faulty fire safety equipment. It had neither an alarm nor a sprinkler system and had only one emergency exit. Moreover, metal barriers used to keep people in line on their way inside ended up blocking people from getting out. Once the security guards realized how serious the fire was, they tried to help people escape. Additionally, firefighters had to open a hole in the outer wall to allow more people to escape. Many people were injured by the crush at the front door. Hundreds of youngsters were killed or hospitalized for smoke inhalation and burns. Dozens of them were in critical condition. Most of the victims were college students, who died of smoke inhalation rather than burns. The fire has the second-highest death toll for an entertainment event in Brazil.

Flesch reading ease score: 60

Concrete words: 24.9%

Slightly more abstract words: 19.3%

Abstract words: 53.9%

Not in list: 1.9%

<u>The Who Concert Disaster [3]</u>

Version: 4 Blunt Ends, 4 Sharp Ends; No Blunt End Blaming [345 words]

In 1979, the band 'The Who' performed at the Riverfront Coliseum as part of their world tour. After one of their band members died of a drug overdose one year earlier, the band embarked on

a U.S. tour that included seven performances. The Riverfront Coliseum show was quickly sold-out, with the majority of tickets sold as unassigned or general-assignment seating. The event managers chose for this type of seating as they never experienced problems with it at previous concerts. According to news reports at the time, the doors were expected to open at 7 p.m. Thousands of people were standing outside, focused at each of the doors. They started to grow restless when they heard members of 'The Who' performing their soundcheck. Inside the coliseum, the security staff and ticket takers were short-staffed. This was due to the change of shifts created by the event managers. They decided to only open a pair of doors at the far right of the main entrance to handle the crowd. However, through the soundcheck and the closed doors, the large crowd of fans started to turn into a panicked stampede. No management plans of the large crowd were created ahead. At first, the police officers on the outside did not spot any immediate problems in the crowd. Therefore, they decided to not intervene. The police did not have any legal authority to order the doors to get open, because the Coliseum was privately owned at that time. People at the back of the crowd started pushing forward, trapping the people in front and pushing them to the ground. After some time has passed, the police started to work their way into the crowd. They found several concertgoers on the ground, which have not been able to breathe. With only a small part of the crowd getting inside, the band started playing their concert. Their band manager hid from them what happened on the outside until after the show. Some people died since they were not able to breathe and a lot of people were injured during the stampede.

Flesch reading ease score: 71

Concrete words: 16.5%

Slightly more abstract words: 19.4%

Abstract words: 60.3%

Not in list: 3.8%

Blunt ends

Contextual information

Blunt end blaming

ICE Disaster nearby Hanover [1]

Version: 4 Blunt Ends; Blunt End Blaming [302 words]

In 1998, hundreds of people had been traveling onboard the ICE of Deutsche Bahn*. Shortly after the stop in Hanover, the tire of a wheel broke at a high speed. In the first wagon, a piece of the cracked wheel started to come up through the floor. No emergency stop got immediately initiated. According to the Deutsche Bahn policies, an emergency stop was only allowed after visual inspection. In the meantime, the broken wheel rim slammed against the guard rail of the next switch point. The switch point was close to an overpass bridge, pulling it away from the railway track. Shortly after, the back part of the train was being slammed against the road bridge. The bridge collapsed, burying parts of the train underneath it. Of the train's twelve wagons, most were either derailed, torn in half next to the bridge, or were crushed into the bridge by the back engine. Many of the wagons collided into the collapsed bridge like an accordion. It resulted in enormous material damage. Over one hundred people died or were injured, some critically. The failure was traced back to the poor design and insufficient testing of Deutsche Bahn because the wheel design decisions were only based on analysis and theory. Additionally, Deutsche Bahn did not replace the wheels on time, even though they knew they were being worn below the recommended standard in diameter. Furthermore, the flawed and ineffective emergency operation procedures of Deutsche Bahn contributed to the disaster as well. Lastly, the inconsiderate placement of the switch, an inherent hazard for high-speed trains, at the overpass bridge, contributed to the severity of the disaster. Until today, it remains the worst rail disaster in the history of Germany. It is also considered the worst high-speed-rail disaster worldwide. Several Deutsche Bahn officials were charged with manslaughter.

*Deutsche Bahn is a German railway company

Flesch reading ease score: 61

Concrete words: 16.5%

Slightly more abstract words: 19.9%

Abstract words: 58.3%

Not in list: 5.3%

Kiss Nightclub Disaster [2]

Version: 4 Blunt Ends; Blunt End Blaming [324 words]

In 2013, a major fire occurred at the Kiss nightclub in the city of Santa Maria, Southern Brazil. The party was organized by students from six universities. Against the club's capacity, it was packed with at least one thousand people who paid for their ticket ahead. The fire started during the night at a show where outdoor pyrotechnics were used and resulted in the cheap material of the club's ceiling getting ignited. Due to a malfunctioning fire extinguisher, the blaze spread throughout the packed club at lightning speed. Thick, toxic smoke got emitted and since the fire started near the air conditioning system, the dispersion of the toxic smoke got accelerated. Those inside panicked as they tried to get out, but the toxic smoke made them lose their sense of direction. They started to confuse the bathroom doors with the exit door. Many people died as they either tried to hide in bathrooms or, in panic mistook them for exits. The club had poor, inflammable insulating foam material in the ceiling and faulty fire safety equipment. It had neither an alarm nor a sprinkler system. Furthermore, the poorly designed club had only one emergency exit. Moreover, metal barriers used to keep people in line on their way inside were inconsiderately placed. They ended up blocking people from getting out. Since there was only one exit, a hole in the outer wall had to be made to allow more people to escape. Many people were injured by the crush at the front door. Hundreds of youngsters were killed or hospitalized for smoke inhalation and burns. Dozens of them were in critical condition. One major problem after the tragedy was the lack of a specific antidote for the toxic smoke. Most of the victims were college students, who died of smoke inhalation rather than burns. The fire has the second-highest death toll for an entertainment event in Brazil. The two nightclub owners were charged with manslaughter.

Flesch reading ease score: 63

Concrete words: 19.7%

Slightly more abstract words: 21.9%

Abstract words: 56.2%

Not in list: 2.2%

The Who Concert Disaster [3]

Version: 4 Blunt Ends; Blunt End Blaming [340 words]

In 1979, the band 'The Who' performed at the Riverfront Coliseum as part of their world tour. At that point, 'The Who' were known as one of the most popular rock bands in the world. After one of their band members died of a drug overdose one year earlier, the band embarked on a U.S. tour that included seven performances. The Riverfront Coliseum show was quickly sold-out, with the majority of the tickets sold as unassigned or general-assignment seating. The event managers inconsiderately chose for this type of seating as they never experienced problems with it at previous concerts. Many of the ticket holders rushed to secure first-come, first-served spots at the edge of the stage, despite the near-freezing temperatures. According to news reports at the time, the doors were expected to open at 7 p.m. Thousands of people were standing outside, focused at each of the doors. They started to grow restless when they heard a soundcheck. Due to an ill-conceived change of shifts for the staff, there were not enough staff members to get all doors opened and occupied. Therefore, only a pair of doors at the far right of the main entrance was opened to handle the crowd. However, the large crowd of fans started to turn into a panicked stampede. No well-thought-out management plans of the large crowd were created ahead. Mistakenly, there was no legal authority assigned to the police to get the doors opened, because the Coliseum was privately owned at that time. People at the back of the crowd started pushing forward, trapping the people in front and pushing them to the ground. Several people tried to assist the fallen. With only a small part of the crowd getting inside, the concert continued to take place. Some people died since they were not able to breathe and a lot of people were injured during the stampede. From there on, unassigned seating and first-come, first-served ticket sales have been banned, with minor exceptions, for the next years. Both event managers were charged with manslaughter.

Flesch reading ease score: 71

Concrete words: 15.9%

Slightly more abstract words: 17.6%

Abstract words: 61.2%

Not in list: 5.3%

Blunt ends

Contextual information

ICE Disaster nearby Hanover [1]

Version: 4 Blunt Ends; No Blunt End Blaming [297 words]

In 1998, hundreds of people had been traveling onboard the ICE of Deutsche Bahn*. Shortly after the stop in Hanover, the tire of a wheel broke at a high speed. In the first wagon, a piece of the cracked wheel started to come up through the floor. No emergency stop got immediately initiated. According to the Deutsche Bahn policies, an emergency stop was only allowed after visual inspection. In the meantime, the broken wheel rim slammed against the guard rail of the next switch point. The switch point was close to an overpass bridge, pulling it away from the railway track. Shortly after, the back part of the train was being slammed against the road bridge. The bridge collapsed, burying parts of the train underneath it. Additionally, several cars on the bridge were crashed during the collapse. Of the train's twelve wagons, most were either derailed, torn in half next to the bridge, or were crushed into the bridge by the back engine. Many of the wagons collided into the collapsed bridge like an accordion. It resulted in enormous material damage. Over one hundred people died or were injured, some critically. The failure was traced back to the design and testing of Deutsche Bahn because the wheel design decisions were only based on analysis and theory. Additionally, Deutsche Bahn did not replace the wheels on time, even though they were being worn below the recommended standard in diameter. Furthermore, the emergency operation procedures of Deutsche Bahn contributed to the disaster as well. Lastly, the placement of the switch, an inherent hazard for high-speed trains, at the overpass bridge, contributed to the severity of the disaster. Until today, it remains the worst rail disaster in the history of Germany. It is also considered the worst high-speed-rail disaster worldwide.

*Deutsche Bahn is a German railway company

Flesch reading ease score: 62

Concrete words: 17.5%

Slightly more abstract words: 20.9%

Abstract words: 56.9%

Not in list: 4.7 %

Kiss Nightclub Disaster [2]

4. **Version: 4 Blunt Ends; No Blunt End Blaming [323 words]**

In 2013, a major fire occurred at the Kiss nightclub in the city of Santa Maria, Southern Brazil. The party was organized by students from six universities. Against the club's capacity, it was packed with at least one thousand people who paid for their ticket ahead. The fire started during the night at a show where outdoor pyrotechnics were used and resulted in the club's ceiling getting ignited. Due to a malfunctioning fire extinguisher, the blaze spread throughout the packed club at lightning speed. Thick, toxic smoke got emitted and since the fire started near the air conditioning system, the dispersion of the toxic smoke got accelerated. Those inside panicked as they tried to get out, but the toxic smoke made them lose their sense of direction. They started to confuse the bathroom doors with the exit door. Many people died as they either tried to hide in bathrooms or, in panic mistook them for exits. Almost two hundred bodies were removed from the bathrooms later on. The club had inflammable insulating foam material in the ceiling and faulty fire safety equipment. It had neither an alarm nor a sprinkler system and had only one emergency exit. Moreover, metal barriers used to keep people in line on their way inside ended up blocking people from getting out. Since there was only one exit, a hole in the outer wall had to be made to allow more people to escape. Many people were injured by the crush at the front door. They began to fall on top of each other. Hundreds of youngsters were killed or hospitalized for smoke inhalation and burns. Dozens of them were in critical condition. One major problem after the tragedy was the lack of a specific antidote for the toxic smoke. Most of the victims were college students, who died of smoke inhalation rather than burns. The fire has the second-highest death toll for an entertainment event in Brazil.

Flesch reading ease score: 64

Concrete words: 20.1%

Slightly more abstract words: 23.2%

Abstract words: 54.5%

Not in list: 2.2%

The Who Concert Disaster [3]

Version: 4 Blunt Ends; No Blunt End Blaming [349 words]

In 1979, the band 'The Who' performed at the Riverfront Coliseum as part of their world tour. At that point, 'The Who' were known as one of the most popular rock bands in the world. After one of their band members died of a drug overdose one year earlier, the band embarked on a U.S. tour that included seven performances. The Riverfront Coliseum show was quickly sold-out, with the majority of the tickets sold as unassigned or general-assignment seating. The event managers chose for this type of seating as they never experienced problems with it at previous concerts. Many of the ticket holders rushed to secure first-come, first-served spots at the edge of the stage, despite the near-freezing temperatures. According to news reports at the time, the doors were expected to open at 7 p.m. Thousands of people were standing outside, focused at each of the doors. They started to grow restless when they heard a soundcheck. Due to the change of shifts for the staff, there were not enough staff members to get all doors opened and occupied. Therefore, only a pair of doors at the far right of the main entrance was opened to handle the crowd. However, the large crowd of fans started to turn into a panicked stampede. No management plans of the large crowd were created ahead. The police did not have any legal authority to order the doors opened, because the Coliseum was privately owned at that time. People at the back of the crowd started pushing forward, trapping the people in front and pushing them to the ground. Several people tried to assist the fallen and protect them from further assault. Additional ranks of crowd members fell on top of them or were forced over them. With only a small part of the crowd getting inside, the concert continued to take place. Some people died since they were not able to breathe and a lot of people were injured during the stampede. From there on, unassigned seating and first-come, first-served ticket sales have been banned, with minor exceptions, for the next years.

Flesch reading ease score: 73

Concrete words: 15.8%

Slightly more abstract words: 20.0%

Abstract words: 59.6%

Not in list: 4.6%

Appendix E: Locus of control questionnaire by Rotter (1966)

You will now receive 29 questions with two answer options. For each question please select the statement that you agree with the most. If you should not agree with either statement, please select the statement that you disagree the least with.

1.

    a. Children get into trouble because their parents punish them too much.

    b. The trouble with most children nowadays is that their parents are too easy with them.

2. .

    a. Many of the unhappy things in people's lives are partly due to bad luck.

    b. People's misfortunes result from the mistakes they make.

3. .

    a. One of the major reasons why we have wars is because people don't take enough interest in politics.

    b. There will always be wars, no matter how hard people try to prevent them.

4. .

    a. In the long run people get the respect they deserve in this world.

    b. Unfortunately, an individual's worth often passes unrecognized no matter how hard he/she tries.

5. .

    a. The idea that teachers are unfair to students is nonsense.

    b. Most students don't realize the extent to which their grades are influenced by accidental happenings.

6. .

a. Without the right breaks one cannot be an effective leader.

b. Capable people who fail to become leaders have not taken advantage of their opportunities.

7. .

a. No matter how hard you try some people just don't like you.

b. People who can't get others to like them don't understand how to get along with others.

8. .

a. Heredity plays the major role in determining one's personality.

b. It is one's experiences in life which determine what they're like.

9. .

a. I have often found that what is going to happen will happen.

b. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.

10. .

a. In the case of the well prepared student there is rarely if ever such a thing as an unfair test.

b. Many times exam questions tend to be so unrelated to course work that studying is really useless.

11. .

a. Becoming a success is a matter of hard work, luck has little or nothing to do with it.

b. Getting a good job depends mainly on being in the right place at the right time.

12. .

a. The average citizen can have an influence in government decisions

b. This world is run by the few people in power, and there is not much the little guy can do about it.

13. .

a. When I make plans, I am almost certain that I can make them work.

b. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.

14. .

a. There are certain people who are just no good.

b. There is some good in everybody.

15. .

a. In my case getting what I want has little or nothing to do with luck.

b. Many times we might just as well decide what to do by flipping a coin.

16. .

a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.

b. Getting people to do the right things depends upon ability, luck has little or nothing to do with it.

17. .

a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control.

b. By taking an active part in political and social affairs the people can control world events.

18. .

a. Most people don't realize the extent to which their lives are controlled by accidental happenings.

b. There really is no such thing as 'luck'.

19. .

a. One should always be willing to admit mistakes.

b. It is usually best to cover up one's mistakes.

20. .

a. It is hard to know whether or not a person really likes you.

b. How many friends you have depends upon how nice a person you are.

21. .

a. In the long run the bad things that happen to us are balanced by the good ones.

b. Most misfortunes are the results of lack of ability, ignorance, laziness, or all three.

22.

a. With enough effort we can wipe out political corruption.

b. It is difficult for people to have much control over the things politicians do in office.

23. .

a. Sometimes I can't understand how teachers arrive at the grades they give.

b. There is a direct connection between how hard I study and the grades I get.

24. .

a. A good leader expects people to decide for themselves what they should do.

b. A good leader makes it clear to everybody what their jobs are.

25. .

a. Many times I feel that I have little influence over the things that happen to me.

b. It is impossible for me to believe that chance or luck plays an important role in my life.

26. .

a. People are lonely because they don't try to be friendly.

b. There's not much use in trying too hard to please people, if they like you, they like you.

27.

a. There is too much emphasis on athletics in high school.

b. Team sports are an excellent way to build character.

28. .

a. What happens to me is my own doing.

b. Sometimes I feel that I don't have enough control over the direction my life is taking.

29. .

a. Most of the time I can't understand why politicians behave the way they do.

b. In the long run the people are responsible for bad government on a national as well as on a local level.

Appendix F: Coding schemes for recall and recall order

Participant ID: […] ; Condition: Sharp Ends Present, Blunt End Blaming

ICE Disaster

Coding scheme content

		Week 1	**Week 2**	**Week 3**
Code		**Yes (1) No (0)**	**Yes (1) No (0)**	**Yes (1) No (0)**
	Contextual information (14)			
1.	1a) People had been traveling onboard of ICE of Deutsche Bahn			
2.	1b) The tire of a wheel broke at a high speed			
3.	1c) The tire of a wheel punctured the floor			
4.	1d) Two passengers from first wagon noticing piece of wheel that came up through floor			
5.	1e) According to Deutsche Bahn policies, an emergency stop was only allowed after visual inspection by the train manager			
6.	1f) Precious time elapsed			
7.	1g) The broken wheel rim slammed against the guard rail of the next switch point			
8.	1h) The switch point was close to an overpass bridge			
9.	1i) The train got pulled away from the railway track			
10.	1j) The back part of the train was being slammed against the road bridge			
11.	1k) The bridge collapsed			
12.	1l) Parts of the train got buried underneath it			
13.	1m) People died or were injured, some critically			
14.	1n) The switch being an inherent hazard for high-speed trains at the overpass bridge			
	Sharp end causes (4)			

1.	2a) Is 'the train conductor noticing some vibrations but not considering them severe' mentioned?			
2.	2b) Is 'the passenger in shock' mentioned?			
3.	2c) Is 'the passenger reporting the damage' mentioned?			
4.	2d) Is 'the train manager not immediately stopping the train (due to policies)' mentioned?			
	1. Blunt end causes (4)			
1.	3a) Is it mentioned 'that the failure was traced back to design (decisions) and testing of Deutsche Bahn as it was based only on analysis and theory'?			
2.	3b) Is 'the missing wheel replacement on time by Deutsche Bahn mentioned even though it was worn below the diameter standard'?			
3.	3c) Is 'the contribution of the emergency operation procedures of Deutsche Bahn to the disaster' mentioned?			
4.	3d) Is 'the contribution of the placement of the switch' mentioned?			
	2. Charges (2)			
1.	4a) Is it mentioned that Deutsche Bahn officials were charged with manslaughter?			
2.	4b) Is it mentioned that the train manager was cleared of all charges due to compliance?			
Total score (24) ***___ out of 24***				

	Week 1	**Week 2**	**Week 3**
Code	**Yes (1) No (0)**	**Yes (1) No (0)**	**Yes (1) No (0)**
Blunt end blaming (5)			

Blaming words				
1.	a) Is it mentioned that the wheel design was 'poor'?			
2.	b) Is it mentioned that the wheel testing was 'insufficient'?			
3.	c) Is it mentioned that Deutsche Bahn 'knew' that the wheels were worn down?			
4.	d) Is it mentioned that the emergency operation procedures were 'flawed and ineffective'?			
5.	e) Is it mentioned that the placement of the switch was 'inconsiderate'?			
Total score (5) **___ out of 5**				

Coding scheme order

Sentence order (original)	*Sentence order (participant)*		
	Week 1	Week 2	Week 3
1. People had been traveling onboard the ICE of Deutsche Bahn*.			
2. The tire of a wheel broke at a high speed.			
3. It punctured the floor.			
4. The train conductor noticed some vibrations but did not consider them severe.			
5. Two passengers from the first wagon noticed that a piece of the cracked wheel came up through the floor.			
6. One of the two passengers was completely in shock.			
7. The other passenger went to report the damage to the train crew.			

8. According to the Deutsche Bahn policies, an emergency stop was only allowed after visual inspection by the train manager.			
9. Precious time elapsed.			
10. The train manager insisting on investigating the damage before stopping the train.			
11. The broken wheel rim slammed against the guard rail of the next switch point.			
12. The switch point was close to an overpass bridge.			
13. The train was getting pulled away from the railway track.			
14. The back part of the train was being slammed against the road bridge.			
15. The bridge collapsed.			
16. Parts of the train got buried underneath it.			
17. People died or were injured, some critically.			
18. The failure was traced back to the (poor) design and (insufficient) testing of Deutsche Bahn because the wheel design decisions were only based on analysis and theory.			
19. Deutsche Bahn did not replace the wheels on time, even though (they knew) they were being worn below the recommended standard in diameter.			
20. The (flawed and ineffective) emergency operation procedures of Deutsche Bahn contributed to the disaster as well.			
21. The (inconsiderate) placement of the switch contributed to the severity of the disaster.			
22. It was an inherent hazard for high-speed trains at the overpass bridge.			

23. Several Deutsche Bahn officials were charged with manslaughter.			
24. The train manager was cleared of all charges due to compliance with the company's policies.			

Kiss Nightclub Disaster

Coding scheme content

		Week 1	**Week 2**	**Week 3**
Code		**Yes (1) No (0)**	**Yes (1) No (0)**	**Yes (1) No (0)**
	1. Contextual information (19)			
1.	1a) A major fire occurred at the Kiss nightclub			
2.	1b) Against the club's capacity, it was packed with many people			
3.	1c) The fire started during the night			
4.	1d) The band did not buy the more expensive indoor fireworks			
5.	1e) It resulted in the material of the club's ceiling getting ignited			
	1f) A malfunctioning fire extinguisher*			
6.	1g) The blaze spread throughout the packed club at lightning speed			
7.	1h) Thick, toxic smoke got emitted			
8.	1i) Those inside panicked as they tried to get out			
9.	1j) The security guards could not directly evaluate the situation's severity inside			
10.	1k) According to the club's regulation, the security guards only let people out who paid for their drinks			

11.	1l) The toxic smoke making the barkeeper and audience lose their sense of direction			
12.	1m) People confusing the bathroom doors with the exit door			
13.	1n) The club not having an alarm system			
14.	1o) The club not having a sprinkler system			
15.	1p) Metal barriers used to keep people in line on their way inside			
16.	1q) Once security guards realized how serious the fire was, they tried to help people escape			
17.	1r) Firefighters had to open a hole in outer wall to allow more people to escape			
18.	1s) Many youngsters were killed or hospitalized for smoke inhalation and burns			
19.	1t) Dozens of youngsters were in critical condition			
	2. Sharp end causes (4)			
1.	2a) Are 'the security guards letting all people in that paid ahead for their ticket' mentioned?			
2.	2b) Is it mentioned that 'A band performing at the club let off firework meant for outdoor use'?			
3.	2c) Are 'the security guards not letting people out of the club (according to club's regulation)' mentioned?			
4.	2d) Is 'the barkeeper starting to point people towards the emergency exit, resulting in confusion' mentioned?			
	3. Blunt end causes (4)			
1.	3a) Is 'the club's inflammable insulating foam material' mentioned?			
2.	3b) Is the 'faulty fire safety equipment' mentioned (including no alarm nor sprinkler system)?			

3.	3c) Is it mentioned that 'the club only had one emergency exit'?			
4.	3d) Is it mentioned that the metal barriers ended up blocking people from getting out?			
	4. Charges (2)			
1.	4.2a) Is it mentioned that the two nightclub owners were charged with manslaughter?			
2.	4.2b) Is it mentioned that the security guards were cleared of all charges due to the complexity of the situation and their compliance with the club's regulation?			
***Total score* (29)** **__ out of 29**				

* Ambiguous statement: could be either sharp/blunt end or context, therefore left out for coding

		Week 1	**Week 2**	**Week 3**
Code		**Yes (1)** **No (0)**	**Yes (1)** **No (0)**	**Yes (1)** **No (0)**
Blunt end blaming (4)				
Blaming words				
1.	a) Is it mentioned that the club's ceiling was of 'cheap' material?			
2.	b) Is it mentioned that the inflammable insulating foam material in the ceiling was 'poor'?			
3.	c) Is it mentioned that the club was 'poorly designed'?			
4.	d) Is it mentioned that the metal barriers were 'inconsiderately placed'?			
Total score (4) **___ out of 4**				

Coding scheme order

Sentence order (original)	*Sentence order (participant)*		
	Week 1	Week 2	Week 3
1. A major fire occurred at the Kiss nightclub.			
2. Against the club's capacity, it was packed with many people.			
3. The security guards let all people in who already paid for their ticket ahead.			
4. The fire started during the night.			
5. A band performing at the club let off fireworks meant for outdoor use.			
6. They did not buy the more expensive indoor fireworks.			
7. It resulted in the (cheap) material of the club's ceiling getting ignited.			
8. A malfunctioning fire extinguisher.			
9. The blaze spread throughout the packed club at lightning speed.			
10. Thick, toxic smoke got emitted.			
11. Those inside panicked as they tried to get out.			

12. The security guards did not let them out.			
13. The security guards could not directly evaluate the situation's severity inside.			
14. According to the club's regulation, they only let people out who paid for their drinks.			
15. The toxic smoke made the barkeeper and audience lose their sense of direction.			
16. The barkeeper started pointing people towards the emergency exit.			
17. The people apparently confused the bathroom doors with the exit door.			
18. The club had (poor), inflammable insulating foam material in the ceiling.			
19. It also had a faulty fire safety equipment.			
20. It had no alarm system.			
21. It had no sprinkler system.			
22. The (poorly designed) club had only one emergency exit.			
23. Metal barriers used to keep people in line on their way			

inside were (inconsiderately) placed.			
24. They ended up blocking people from getting out.			
25. Once the security guards realized how serious the fire was, they tried to help people escape.			
26. Firefighters had to open a hole in the outer wall to allow more people to escape.			
27. Many youngsters were killed or hospitalized for smoke inhalation and burns.			
28. Dozens of them were in critical condition.			
29. The two nightclub owners were charged with manslaughter.			
30. The security guards were cleared of all charges due to the complexity of the situation as they only complied with the club's regulations.			

'The Who' Concert Disaster

Coding scheme content

		Week 1	Week 2	Week 3
Code		**Yes (1) No (0)**	**Yes (1) No (0)**	**Yes (1) No (0)**
1. Contextual information (20)				
1.	1a) The band 'The Who' performed at the Riverfront Coliseum as part of their world tour			
2.	1b) It was a sold-out show			
3.	1c) The majority of the tickets sold as unassigned or general-assignment seating			
4.	1d) According to news reports at the time, the doors were expected to open at 7 p.m.			
5.	1e) People outside grew restless			
6.	1f) Inside the coliseum, the security staff and ticket takers were short-staffed			
7.	1g) The large crowd of fans started to turn into a panicked stampede			
8.	1i) The police officers on the outside did not spot any immediate problems in the crowd			
9.	1j) The coliseum was privately owned at that time			
10.	1k) People at the back of the crowd started pushing forward			
11.	1l) Trapping the people in front			
12.	1m) Pushing them to the ground			
13.	1n) After some time has passed, the police started to work their way into the crowd			
14.	1o) They found several dead concertgoers on the ground			
15.	1p) They have not been able to breathe			
16.	1q) With only a small part of the crowd getting inside			

17.	1r) The band started playing their concert			
18.	1s) Some people died since they were not able to breathe			
19.	1t) A lot of people were injured during the stampede			
20.	1u) First-come, first-served ticket sales have been banned			
	2. Sharp end causes (4)			
1.	2a) Are 'the security staff and ticket takers deciding to only open a pair of doors at the far right of the main entrance to handle the crowd' mentioned?			
2.	2b) Is it mentioned that 'members of 'The Who' performed a soundcheck when the doors should get opened'?			
3.	2c) Is it mentioned that 'the police officers decided not to immediately intervene'?			
4.	2d) Is 'the band manager hiding information from the band about what happened outside until after the show' mentioned?			
	3. Blunt end causes (4)			
1.	3a) Is 'the event managers decision for unassigned seating as they never experienced problems with it at previous concerts' mentioned?			
2.	3b) Is the 'the change of shifts created by the event managers' mentioned?			
3.	3c) Is it mentioned that 'no management plans of the large crowd were created ahead'?			
4.	3d) Is 'the police not having any legal authority to order the doors to get opened' mentioned?			
	4. Charges (2)			
1.	4a) Is it mentioned that the event managers were charged with manslaughter?			

2.	4b) Is it mentioned that the involved police officers were cleared of all charges due to the complexity of the situation?			
***Total score* (30)** **___ out of 30**				

		Week 1	**Week 2**	**Week 3**
Code		**Yes (1)** **No (0)**	**Yes (1)** **No (0)**	**Yes (1)** **No (0)**
Blunt end blaming (4)				
Blaming words				
1.	4.1a) Is it mentioned the event managers chose 'inconsiderately' for the type of seating?			
2.	4.1b) Is it mentioned that the change of shifts by the event managers was 'ill-conceived'?			
3.	4.1c) Is it mentioned that the management plans were not 'well-thought-out'?			
4.	4.1d) Is it mentioned that the police had 'mistakenly' no legal authority?			
Total score (4) **___ out of 4**				

Coding scheme order

Sentence order (original)	*Sentence order (participant)*		
	Week 1	Week 2	Week 3
1. The band 'The Who' performed at the Riverfront Coliseum as part of their world tour.			
2. It was a sold-out show.			

3. The majority of the tickets sold as unassigned or general-assignment seating.			
4. The event managers (inconsiderately) chose for this type of seating as they never experienced problems with it at previous concerts.			
5. According to news reports at the time, the doors were expected to open at 7 p.m.			
6. People outside grew restless.			
7. Members of 'The Who' performing their soundcheck.			
8. Inside the coliseum, the security staff and ticket takers were short-staffed.			
9. This was due to the (ill-conceived) change of shifts by the event managers.			
10. They decided to only open a pair of doors at the far right of the main entrance to handle the crowd.			
11. The large crowd of fans started to turn into a panicked stampede.			
12. No (well-thought-out) management plans of the large crowd were created ahead.			
13. The police officers on the outside did not spot any immediate problems in the crowd.			
14. They decided to not intervene.			
15. The police (mistakenly) did not have any legal authority to order the doors to get open.			
16. The coliseum was privately owned at that time.			
17. People at the back of the crowd started pushing forward.			
18. Trapping the people in front.			
19. Pushing them to the ground.			

20. After some time has passed, the police started to work their way into the crowd.			
21. They found several dead concertgoers on the ground.			
22. They have not been able to breathe.			
23. With only a small part of the crowd getting inside.			
24. The band started playing their concert.			
25. Their band manager hid from them what happened on the outside until after the show.			
26. Some people died since they were not able to breathe.			
27. A lot of people were injured during the stampede.			
28. First-come, first-served ticket sales have been banned.			
29. Both event managers were charged with manslaughter.			
30. The involved police officers were cleared of all charges due to the complexity of the situation.			

Participant ID: […] ; Condition: Sharp Ends Present, No Blunt End Blaming

ICE Disaster

Coding scheme content

		Week 1	**Week 2**	**Week 3**
Code		**Yes (1) No (0)**	**Yes (1) No (0)**	**Yes (1) No (0)**
1. Contextual information (17)				
1.	1a) People had been traveling onboard of ICE of Deutsche Bahn			
2.	1b) The tire of a wheel broke at a high speed			

3.	1c) The tire of a wheel punctured the floor			
4.	1d) Two passengers from first wagon noticing piece of wheel that came up through floor			
5.	1e) According to Deutsche Bahn policies, an emergency stop was only allowed after visual inspection by the train manager			
6.	1f) Precious time elapsed			
7.	1g) The broken wheel rim slammed against the guard rail of the next switch point			
8.	1h) The switch point was close to an overpass bridge			
9.	1i) The train got pulled away from the railway track			
10.	1j) The back part of the train was being slammed against the road bridge			
11.	1k) The bridge collapsed			
12.	1l) Parts of the train got buried underneath it			
13.	1m) Most wagons were derailed			
14.	1n) Most wagons were torn in half			
15.	1o) Most wagons were crushed into the bridge by the back engine			
16.	1p) People died or were injured, some critically			
17.	1q) The switch being an inherent hazard for high-speed trains at the overpass bridge			
	2. Sharp end causes (4)			
1.	2a) Is ‘the train conductor noticing some vibrations but not considering them severe’ mentioned?			
2.	2b) Is ‘the passenger in shock’ mentioned?			
3.	2c) Is ‘the passenger reporting the damage’ mentioned?			
4.	2d) Is ‘the train manager not immediately stopping the train (due to policies)’ mentioned?			
	3. Blunt end causes (4)			

1.	3a) Is it mentioned 'that the failure was traced back to design (decisions) and testing of Deutsche Bahn as it was based only on analysis and theory'?			
2.	3b) Is 'the missing wheel replacement on time by Deutsche Bahn mentioned even though it was worn below the diameter standard'?			
3.	3c) Is 'the contribution of the emergency operation procedures of Deutsche Bahn to the disaster' mentioned?			
4.	3d) Is 'the contribution of the placement of the switch' mentioned?			
Total score (25) **__ out of 25**				

Non-blunt end blaming – Just additional notes, not count in			
Blaming words			
	Week 1	**Week 2**	**Week 3**
Code	**Yes (1)** **No (0)**	**Yes (1)** **No (0)**	**Yes (1)** **No (0)**
Have any blaming words been used that were not mentioned in the text?			

Coding scheme order

Sentence order (original)	*Sentence order (participant)*		
	Week 1	Week 2	Week 3

1. People had been traveling onboard the ICE of Deutsche Bahn*.			
2. The tire of a wheel broke at a high speed.			
3. It punctured the floor.			
4. The train conductor noticed some vibrations but did not consider them severe.			
5. Two passengers from the first wagon noticed that a piece of the cracked wheel came up through the floor.			
6. One of the two passengers was completely in shock.			
7. The other passenger went to report the damage to the train crew.			
8. According to the Deutsche Bahn policies, an emergency stop was only allowed after visual inspection by the train manager			
9. Precious time elapsed			
10. The train manager insisting on investigating the damage before stopping the train.			
11. The broken wheel rim slammed against the guard rail of the next switch point.			
12. The switch point was close to an overpass bridge			

13. The train was getting pulled away from the railway track			
14. The back part of the train was being slammed against the road bridge			
15. The bridge collapsed			
16. Parts of the train got buried underneath it			
17. Of the train's wagons, most were either derailed			
18. They were torn in half next to the bridge			
19. Or they were crushed into the bridge by the back engine			
20. People died or were injured, some critically			
21. The failure was traced back to the design and testing of Deutsche Bahn because the wheel design decisions were only based on analysis and theory			
22. Deutsche Bahn did not replace the wheels on time, even though they were being worn below the recommended standard in diameter.			
23. The emergency operation procedures of Deutsche Bahn contributed to the disaster as well.			

24. Lastly, the placement of the switch contributed to the severity of the disaster.			
25. It was an inherent hazard for high-speed trains at the overpass bridge.			

Kiss Nightclub Disaster

Coding scheme content

		Week 1	**Week 2**	**Week 3**
Code		**Yes (1) No (0)**	**Yes (1) No (0)**	**Yes (1) No (0)**
	1. Contextual information (22)			
1.	1a) A major fire occurred at the Kiss nightclub			
2.	1b) Against the club's capacity, it was packed with many people.			
3.	1c) The fire started during the night.			
4.	1d) They did not buy the more expensive indoor fireworks.			
5.	1e) It resulted in the club's ceiling getting ignited.			
	1f) A malfunctioning fire extinguisher.*			
6.	1g) The blaze spread throughout the packed club at lightning speed.			
7.	1h) Thick, toxic smoke got emitted.			
8.	1i) Those inside panicked as they tried to get out.			
9.	1j) The security guards could not directly evaluate the situation's severity inside.			

10.	1k) According to the club's regulation, they only let people out who paid for their drinks.			
11.	1l) The toxic smoke made the barkeeper and audience lose their sense of direction.			
12.	1m) The people apparently confused the bathroom doors with the exit door.			
13.	1n) The club not having an alarm system			
14.	1o) The club not having a sprinkler system			
15.	1p) Metal barriers used to keep people in line on their way inside			
16.	1q) Once the security guards realized how serious the fire was, they tried to help people escape.			
17.	1r) Firefighters had to open a hole in the outer wall to allow more people to escape.			
18.	1s) Many people were injured by the crush at the front door.			
19.	1t) Many youngsters were killed or hospitalized for smoke inhalation and burns.			
20.	1u) Dozens of them were in critical condition.			
21.	1v) Most of the victims were college students and died of smoke inhalation rather than burns.			
22.	1w) The fire has the second-highest death toll for an entertainment event in Brazil.			
	2. Sharp end causes (4)			
1.	2a) Are 'the security guards letting all people in that paid ahead for their ticket' mentioned?			
2.	2b) Is it mentioned that 'A band performing at the club let off firework meant for outdoor use'?			
3.	2c) Are 'the security guards not letting people out of the club (according to club's regulation)' mentioned?			

4.	2d) Is 'the barkeeper starting to point people towards the emergency exit, resulting in confusion' mentioned?			
	3. Blunt end causes (4)			
1.	3a) Is 'the club's inflammable insulating foam material' mentioned?			
2.	3b) Is the 'faulty fire safety equipment' mentioned (including no alarm nor sprinkler system)?			
3.	3c) Is it mentioned that 'the club only had one emergency exit'?			
4.	3d) Is it mentioned that the metal barriers ended up blocking people from getting out?			
Total score (30) **__ out of 30**				

* Ambiguous statement: could be either sharp/blunt end or context, therefore left out for coding

Non-blunt end blaming – Just additional notes, not count in			
Blaming words			
	Week 1	**Week 2**	**Week 3**
Code	**Yes (1)** **No (0)**	**Yes (1)** **No (0)**	**Yes (1)** **No (0)**
Have any blaming words been used that were not mentioned in the text?			

Coding scheme order

Sentence order (original)	*Sentence order (participant)*		
	Week 1	Week 2	Week 3

1. A major fire occurred at the Kiss nightclub, Southern Brazil.			
2. Against the club's capacity, it was packed with many people.			
3. The security guards let all people in who already paid for their ticket ahead.			
4. The fire started during the night.			
5. A band performing at the club let off fireworks meant for outdoor use.			
6. They did not buy the more expensive indoor fireworks.			
7. It resulted in the club's ceiling getting ignited.			
8. A malfunctioning fire extinguisher.			
9. The blaze spread throughout the packed club at lightning speed.			
10. Thick, toxic smoke got emitted.			
11. Those inside panicked as they tried to get out.			
12. The security guards did not let them out.			
13. The security guards could not directly evaluate the situation's severity inside.			
14. According to the club's regulation, they only let people out who paid for their drinks.			

15. The toxic smoke made the barkeeper and audience lose their sense of direction.			
16. The barkeeper started pointing people towards the emergency exit.			
17. The people apparently confused the bathroom doors with the exit door.			
18. The club had inflammable insulating foam material in the ceiling.			
19. It also had a faulty fire safety equipment.			
20. It had no alarm system.			
21. It had no sprinkler system.			
22. The club had only one emergency exit.			
23. Metal barriers used to keep people in line on their way inside.			
24. They ended up blocking people from getting out.			
25. Once the security guards realized how serious the fire was, they tried to help people escape.			
26. Firefighters had to open a hole in the outer wall to allow more people to escape.			
27. Many people were injured by the crush at the front door.			

28. Many youngsters were killed or hospitalized for smoke inhalation and burns.			
29. Dozens of them were in critical condition.			
30. Most of the victims were college students and died of smoke inhalation rather than burns.			
31. The fire has the second-highest death toll for an entertainment event in Brazil.			

'The Who' Concert Disaster

Coding scheme content

		Week 1	**Week 2**	**Week 3**
Code		**Yes (1) No (0)**	**Yes (1) No (0)**	**Yes (1) No (0)**
	1. Contextual information (22)			
1.	1a) The band 'The Who' performed at the Riverfront Coliseum as part of their world tour			
2.	1b) One of their band members died of a drug overdose one year earlier			
3.	1c) The band embarked on a U.S. tour that included seven performances			
4.	1d) The Riverfront Coliseum show was quickly sold-out			
5.	1e) The majority of the tickets sold as unassigned or general-assignment seating			
6.	1f) According to news reports at the time, the doors were expected to open at 7 p.m.			

7.	1g) People were standing outside, focused at each of the doors			
8.	1h) They started to grow restless			
9.	1i) Inside the coliseum, the security staff and ticket takers were short-staffed			
10.	1j) The large crowd of fans started to turn into a panicked stampede			
11.	1k) The police officers on the outside did not spot any immediate problems in the crowd			
12.	1l) The coliseum was privately owned at that time			
13.	1m) People at the back of the crowd started pushing forward			
14.	1n) Trapping the people in front			
15.	1o) Pushing them to the ground			
16.	1p) After some time has passed, the police started to work their way into the crowd			
17.	1q) They found several dead concertgoers on the ground			
18.	1r) They have not been able to breathe			
19.	1s) With only a small part of the crowd getting inside			
20.	1t) The band started playing their concert			
21.	1u) Some people died since they were not able to breathe.			
22.	1v) A lot of people were injured during the stampede			
	2. Sharp end causes (4)			
1.	2a) Are 'the security staff and ticket takers deciding to only open a pair of doors at the far right of the main entrance to handle the crowd' mentioned?			
2.	2b) Is it mentioned that 'members of 'The Who' performed a soundcheck when the doors should get opened'?			

3.	2c) Is it mentioned that 'the police officers decided not to immediately intervene'?			
4.	2d) Is 'the band manager hiding information from the band about what happened outside until after the show' mentioned?			
	3. Blunt end causes (4)			
1.	3a) Is 'the event managers decision for unassigned seating as they never experienced problems with it at previous concerts' mentioned?			
2.	3b) Is the 'the change of shifts created by the event managers' mentioned?			
3.	3c) Is it mentioned that 'no management plans of the large crowd were created ahead'?			
4.	3d) Is 'the police not having any legal authority to order the doors to get opened' mentioned?			
Total score (30) **__ out of 30**				

Non-blunt end blaming – Just additional notes, not count in			
Blaming words			
	Week 1	**Week 2**	**Week 3**
Code	**Yes (1)** **No (0)**	**Yes (1)** **No (0)**	**Yes (1)** **No (0)**
Have any blaming words been used that were not mentioned in the text?			

Coding scheme order

Sentence order (original)	*Sentence order (participant)*		
	Week 1	Week 2	Week 3
1. The band 'The Who' performed at the Riverfront Coliseum as part of their world tour.			
2. One of their band members died of a drug overdose one year earlier.			
3. The band embarked on a U.S. tour that included seven performances.			
4. The Riverfront Coliseum show was quickly sold-out.			
5. The majority of tickets sold as unassigned or general-assignment seating.			
6. The event managers chose for this type of seating as they never experienced problems with it at previous concerts.			
7. According to news reports at the time, the doors were expected to open at 7 p.m.			
8. People were standing outside, focused at each of the doors.			
9. They started to grow restless.			
10. Members of 'The Who' performing their soundcheck.			
11. Inside the coliseum, the security staff and ticket takers were short-staffed.			

12. This was due to the change of shifts created by the event managers.			
13. They decided to only open a pair of doors at the far right of the main entrance to handle the crowd.			
14. The large crowd of fans started to turn into a panicked stampede.			
15. No management plans of the large crowd were created ahead.			
16. The police officers on the outside did not spot any immediate problems in the crowd.			
17. They decided to not intervene.			
18. The police did not have any legal authority to order the doors to get open.			
19. The coliseum was privately owned at that time.			
20. People at the back of the crowd started pushing forward.			
21. Trapping the people in front.			
22. Pushing them to the ground.			
23. After some time has passed, the police started to work their way into the crowd.			
24. They found several concertgoers on the ground.			
25. They have not been able to breathe.			

26. With only a small part of the crowd getting inside.			
27. The band started playing their concert.			
28. Their band manager hid from them what happened on the outside until after the show.			
29. Some people died since they were not able to breathe.			
30. A lot of people were injured during the stampede.			

Participant ID: […] ; Condition: Sharp Ends Absent, Blunt End Blaming

ICE Disaster nearby Hanover

Coding scheme content

		Week 1	**Week 2**	**Week 3**
Code		**Yes (1) No (0)**	**Yes (1) No (0)**	**Yes (1) No (0)**
	1. Contextual information (19)			
1.	1a) People had been traveling onboard of ICE of Deutsche Bahn			
2.	1b) The tire of a wheel broke at a high speed			
3.	1c) In the first wagon, a piece of the cracked wheel started to come up through the floor			
	1d) No emergency stop got immediately initiated*			
4.	1e) According to Deutsche Bahn policies, an emergency stop was only allowed after visual inspection			

5.	1f) The broken wheel rim slammed against the guard rail of the next switch point			
6.	1g) The switch point was close to an overpass bridge			
7.	1h) The train got pulled away from the railway track			
8.	1i) The back part of the train was being slammed against the road bridge			
9.	1j) The bridge collapsed			
10.	1k) Parts of the train got buried underneath it			
11.	1l) Of the train's wagons, most were either derailed			
12.	1m) They were torn in half next to the bridge			
13.	1n) Or they were crushed into the bridge by the back engine			
14.	1o) Many of the wagons collided into the collapsed bridge like an accordion			
15.	1p) It resulted in enormous material damage			
16.	1q) People died or were injured, some critically			
17.	1r) The switch being an inherent hazard for high-speed trains at the overpass bridge			
18.	1s) The disaster remains the worst rail disaster in the history of Germany			
19	1t) The disaster is also considered the worst high-speed-rail disaster worldwide			
	2. Blunt end causes (4)			
1.	2a) Is it mentioned 'that the failure was traced back to design (decisions) and testing of Deutsche Bahn as it was based only on analysis and theory'?			
2.	2b) Is 'the missing wheel replacement on time by Deutsche Bahn mentioned even though it was worn below the diameter standard'?			

3.	2c) Is 'the contribution of the emergency operation procedures of Deutsche Bahn to the disaster' mentioned?			
4.	2d) Is 'the contribution of the placement of the switch' mentioned?			
3. *Charges (1)*				
1.	3a) Is it mentioned that Deutsche Bahn officials were charged with manslaughter?			
Total score (24) **___ out of 24**				

* Ambiguous statement: could be either sharp/blunt end or context, therefore left out for coding

		Week 1	**Week 2**	**Week 3**
Code		**Yes (1) No (0)**	**Yes (1) No (0)**	**Yes (1) No (0)**
Blunt end blaming (5)				
Blaming words				
1.	a) Is it mentioned that the wheel design was 'poor'?			
2.	b) Is it mentioned that the wheel testing was 'insufficient'?			
3.	c) Is it mentioned that Deutsche Bahn 'knew' that the wheels were worn down?			
4.	d) Is it mentioned that the emergency operation procedures were 'flawed and ineffective'?			
5.	e) Is it mentioned that the placement of the switch was 'inconsiderate'?			
Total score (5) **___ out of 5**				

Coding scheme order

Sentence order (original)	*Sentence order (participant)*		
	Week 1	Week 2	Week 3
1. People had been traveling onboard the ICE of Deutsche Bahn*.			
2. The tire of a wheel broke at a high speed.			
3. In the first wagon, a piece of the cracked wheel started to come up through the floor.			
4. No emergency stop got immediately initiated.			
5. According to the Deutsche Bahn policies, an emergency stop was only allowed after visual inspection.			
6. The broken wheel rim slammed against the guard rail of the next switch point.			
7. The switch point was close to an overpass bridge.			
8. The train was getting pulled away from the railway track.			

9. The back part of the train was being slammed against the road bridge.			
10. The bridge collapsed.			
11. Parts of the train got buried underneath it.			
12. Of the train's wagons, most were either derailed.			
13. They were torn in half next to the bridge.			
14. Or they were crushed into the bridge by the back engine.			
15. Many of the wagons collided into the collapsed bridge like an accordion.			
16. It resulted in enormous material damage.			
17. People died or were injured, some critically.			
18. The failure was traced back to the (poor) design and (insufficient) testing of Deutsche Bahn because the wheel design decisions were only based on analysis and theory.			
19. Deutsche Bahn did not replace the wheels on time, even though (they knew) they were being worn			

below the recommended standard in diameter.			
20. The (flawed and ineffective) emergency operation procedures of Deutsche Bahn contributed to the disaster as well.			
21. The (inconsiderate) placement of the switch contributed to the severity of the disaster.			
22. It was an inherent hazard for high-speed trains at the overpass bridge.			
23. Until today, it remains the worst rail disaster in the history of Germany.			
24. It is also considered the worst high-speed-rail disaster worldwide.			
25. Several Deutsche Bahn officials were charged with manslaughter.			

Kiss Nightclub Disaster

Coding scheme content

		Week 1	Week 2	Week 3
Code		**Yes (1) No (0)**	**Yes (1) No (0)**	**Yes (1) No (0)**
1. Contextual information (22)				
1.	1a) A major fire occurred at the Kiss nightclub, Southern Brazil			
2.	1b) The party was organized by students from universities.			
	1c) Against the club's capacity, it was packed with many people who paid for their ticket ahead*			
	1d) The fire started during the night at a show where outdoor pyrotechnics were used*			
3.	1e) It resulted in the material of the club's ceiling getting ignited			
	1f) A malfunctioning fire extinguisher*			
4.	1g) The blaze spread throughout the packed club at lightning speed			
5.	1h) Thick, toxic smoke got emitted			
6.	1i) The fire started near the air conditioning system			
7.	1j) The dispersion of the toxic smoke got accelerated			
8.	1k) Those inside panicked as they tried to get out			
9.	1l) The toxic smoke made them lose their sense of direction			
10.	1m) They started to confuse the bathroom doors with the exit door			
11.	1n) Many people died as they either tried to hide in bathrooms			
12.	1o) Or in panic mistook them for exits			

13.	1p) The club not having an alarm system			
14.	1q) The club not having a sprinkler system			
15.	1r) The metal barriers used to keep people in line on their way inside			
16.	1s) Since there was only one exit, a hole in the outer wall had to be made to allow more people to escape			
17.	1t) Many people were injured by the crush at the front door.			
18.	1u) Many youngsters were killed or hospitalized for smoke inhalation and burns			
19.	1v) Dozens of youngsters were in critical condition			
20.	1w) One major problem after the tragedy was the lack of a specific antidote for the toxic smoke.			
21.	1x) Most of the victims were college students and died of smoke inhalation rather than burns.			
22.	1y) The fire has the second-highest death toll for an entertainment event in Brazil.			
	2. Blunt end causes (4)			
1.	2a) Is 'the club's inflammable insulating foam material' mentioned?			
2.	2b) Is the 'faulty fire safety equipment' mentioned (including no alarm nor sprinkler system)?			
3.	2c) Is it mentioned that 'the club only had one emergency exit'?			
4.	2d) Is it mentioned that the metal barriers ended up blocking people from getting out?			
	3. Charges (1)			
1.	a) Is it mentioned that the two nightclub owners were charged with manslaughter?			
Total score (27)				

___ out of 27			

* Ambiguous statement: could be either sharp/blunt end or context, therefore left out for coding

		Week 1	**Week 2**	**Week 3**
Code		**Yes (1) No (0)**	**Yes (1) No (0)**	**Yes (1) No (0)**
Blunt end blaming (4)				
Blaming words				
1.	a) Is it mentioned that the club's ceiling was of 'cheap' material?			
2.	b) Is it mentioned that the inflammable insulating foam material in the ceiling was 'poor'?			
3.	c) Is it mentioned that the club was 'poorly designed'?			
4.	d) Is it mentioned that the metal barriers were 'inconsiderately placed'?			
Total score (4) **___ out of 4**				

Coding scheme order

Sentence order (original)	*Sentence order (participant)*		
	Week 1	Week 2	Week 3
1. A major fire occurred at the Kiss nightclub, Southern Brazil.			
2. The party was organized by students from six universities.			

3. Against the club's capacity, it was packed with many people who paid for their ticket ahead.			
4. The fire started during the night at a show where outdoor pyrotechnics were used.			
5. It resulted in the (cheap) material of the club's ceiling getting ignited.			
6. A malfunctioning fire extinguisher.			
7. The blaze spread throughout the packed club at lightning speed.			
8. Thick, toxic smoke got emitted.			
9. The fire started near the air conditioning system.			
10. The dispersion of the toxic smoke got accelerated.			
11. Those inside panicked as they tried to get out.			
12. The toxic smoke made them lose their sense of direction.			
13. They started to confuse the bathroom doors with the exit door.			
14. Many people died as they either tried to hide in bathrooms.			
15. Or in panic mistook them for exits.			
16. The club had (poor,) inflammable insulating foam material in the ceiling.			

17. It also had a faulty fire safety equipment.			
18. It had no alarm system.			
19. It had no sprinkler system.			
20. The (poorly designed) club had only one emergency exit.			
21. Metal barriers used to keep people in line on their way inside (were inconsiderately placed).			
22. They ended up blocking people from getting out.			
23. Since there was only one exit, a hole in the outer wall had to be made to allow more people to escape.			
24. Many people were injured by the crush at the front door.			
25. Hundreds of youngsters were killed or hospitalized for smoke inhalation and burns.			
26. Dozens of them were in critical condition.			
27. One major problem after the tragedy was the lack of a specific antidote for the toxic smoke.			
28. Most of the victims were college students and died of smoke inhalation rather than burns.			
29. The fire has the second-highest death toll for an entertainment event in Brazil.			

30. The two nightclub owners were charged with manslaughter.			

'The Who' Concert Disaster

Coding scheme content

		Week 1	**Week 2**	**Week 3**
Code		**Yes (1) No (0)**	**Yes (1) No (0)**	**Yes (1) No (0)**
1. Contextual information (22)				
1.	1a) The band 'The Who' performed at the Riverfront Coliseum as part of their world tour			
2.	1b) 'The Who' were known as one of the most popular rock bands in the world			
3.	1c) One of their band members died of a drug overdose one year earlier			
4.	1d) The band embarked on a U.S. tour that included seven performances			
5.	1e) The Riverfront Coliseum show was quickly sold-out			
6.	1f) The majority of the tickets sold as unassigned or general-assignment seating			
7.	1g) Many of the ticket holders rushed to secure first-come, first-served spots at the edge of the stage.			
8.	1h) Despite the near-freezing temperatures.			
9.	1i) According to news reports at the time, the doors were expected to open at 7 p.m.			
10.	1j) People were standing outside, focused at each of the doors.			

11.	1k) They started to grow restless.			
	1l) They heard a soundcheck*			
	1m) Only a pair of doors at the far right of the main entrance was opened to handle the crowd*			
12.	1n) The large crowd of fans started to turn into a panicked stampede			
13.	1o) The coliseum was privately owned at that time			
14.	1p) People at the back of the crowd started pushing forward			
15.	1q) Trapping the people in front			
16.	1r) Pushing them to the ground			
17.	1s) Several people tried to assist the fallen.			
18.	1t) With only a small part of the crowd getting inside			
19.	1u) The concert continued to take place			
20.	1v) Some people died since they were not able to breathe.			
21.	1w) A lot of people were injured during the stampede			
22.	1x) From there on, unassigned seating and first-come, first-served ticket sales have been banned, with minor exceptions, for the next years.			
	2. Blunt end causes (4)			
1.	2a) Is 'the event managers decision for unassigned seating as they never experienced problems with it at previous concerts' mentioned?			
2.	2b) Is the 'the change of shifts created by the event managers' mentioned?			
3.	2c) Is it mentioned that 'no management plans of the large crowd were created ahead'?			
4.	2d) Is 'the police not having any legal authority to order the doors to get opened' mentioned?			
	3. Charges (1)			

1.	3a) Is it mentioned that the event managers were charged with manslaughter?			
Total score (27) **___ out of 27**				

* Ambiguous statement: could be either sharp/blunt end or context, therefore left out for coding

		Week 1	**Week 2**	**Week 3**
Code		**Yes (1) No (0)**	**Yes (1) No (0)**	**Yes (1) No (0)**
Blunt end blaming (4)				
Blaming words				
1.	4.1a) Is it mentioned the event managers chose 'inconsiderately' for the type of seating?	**0**	**0**	**0**
2.	4.1b) Is it mentioned that the change of shifts by the event managers was 'ill-conceived'?	**0**	**0**	**0**
3.	4.1c) Is it mentioned that the management plans were not 'well-thought-out'?	**0**	**0**	**0**
4.	4.1d) Is it mentioned that the police had 'mistakenly' no legal authority?	**0**	**0**	**0**
Total score (4) **___ out of 4**				

Coding scheme order

Sentence order (original)	*Sentence order (participant)*		
	Week 1	Week 2	Week 3
1. The band 'The Who' performed at the Riverfront Coliseum as part of their world tour.			

2. 'The Who' were known as one of the most popular rock bands in the world.			
3. One of their band members died of a drug overdose one year earlier.			
4. The band embarked on a U.S. tour that included seven performances.			
5. The Riverfront Coliseum show was quickly sold-out.			
6. The majority of the tickets sold as unassigned or general-assignment seating.			
7. The event managers (inconsiderately) chose for this type of seating as they never experienced problems with it at previous concerts.			
8. Many of the ticket holders rushed to secure first-come, first-served spots at the edge of the stage.			
9. Despite the near-freezing temperatures.			
10. According to news reports at the time, the doors were expected to open at 7 p.m.			
11. People were standing outside, focused at each of the doors.			
12. They started to grow restless.			
13. They heard a soundcheck.			

14. Due to an (ill-conceived) change of shifts for the staff, there were not enough staff members to get all doors opened and occupied.			
15. Only a pair of doors at the far right of the main entrance was opened to handle the crowd.			
16. The large crowd of fans started to turn into a panicked stampede.			
17. No (well-thought-out) management plans of the large crowd were created ahead.			
18. (Mistakenly,) there was no legal authority assigned to the police to get the doors opened.			
19. The Coliseum was privately owned at that time.			
20. People at the back of the crowd started pushing forward.			
21. Trapping the people in front.			
22. Pushing them to the ground.			
23. Several people tried to assist the fallen.			
24. With only a small part of the crowd getting inside.			
25. The concert continued to take place.			
26. Some people died since they were not able to breathe.			
27. A lot of people were injured during the stampede.			

28. From there on, unassigned seating and first-come, first-served ticket sales have been banned, with minor exceptions, for the next years.			
29. Both event managers were charged with manslaughter.			

Participant ID: […] ; Condition: Sharp Ends Absent, Blunt End Blaming

ICE Disaster nearby Hanover

Coding scheme content

		Week 1	**Week 2**	**Week 3**
Code		**Yes (1) No (0)**	**Yes (1) No (0)**	**Yes (1) No (0)**
	1. Contextual information (20)			
1.	1a) People had been traveling onboard of ICE of Deutsche Bahn			
2.	1b) The tire of a wheel broke at a high speed			
3.	1c) In the first wagon, a piece of the cracked wheel started to come up through the floor			
	1d) No emergency stop got immediately initiated*			
4.	1e) According to Deutsche Bahn policies, an emergency stop was only allowed after visual inspection			
5.	1f) The broken wheel rim slammed against the guard rail of the next switch point			
6.	1g) The switch point was close to an overpass bridge			
7.	1h) The train was getting pulled away from the railway track			

8.	1i) The back part of the train was being slammed against the road bridge			
9.	1j) The bridge collapsed			
10.	1k) Parts of the train got buried underneath it			
11.	1l) Several cars on the bridge were crashed during the collapse			
12.	1m) Of the train's wagons, most were either derailed			
13.	1n) They were torn in half next to the bridge			
14.	1o) Or they were crushed into the bridge by the back engine			
15.	1p) Many of the wagons collided into the collapsed bridge like an accordion			
16.	1q) It resulted in enormous material damage			
17.	1r) People died or were injured, some critically			
18.	1s) The switch being an inherent hazard for high-speed trains at the overpass bridge			
19.	1t) The disaster remains the worst rail disaster in the history of Germany			
20.	1u) The disaster is also considered the worst high-speed-rail disaster worldwide			
	2. Blunt end causes (4)			
1.	2a) Is it mentioned 'that the failure was traced back to design (decisions) and testing of Deutsche Bahn as it was based only on analysis and theory'?			
2.	2b) Is 'the missing wheel replacement on time by Deutsche Bahn mentioned even though it was worn below the diameter standard'?			
3.	2c) Is 'the contribution of the emergency operation procedures of Deutsche Bahn to the disaster' mentioned?			

4.	2d) Is 'the contribution of the placement of the switch' mentioned?			
Total score (24) **__ out of 24**				

* Ambiguous statement: could be either sharp/blunt end or context, therefore left out for coding

Non-blunt end blaming – Just additional notes, not count in			
Blaming words			
	Week 1	**Week 2**	**Week 3**
Code	**Yes (1)** **No (0)**	**Yes (1)** **No (0)**	**Yes (1)** **No (0)**
Have any blaming words been used that were not mentioned in the text?			

Coding scheme order

Sentence order (original)	*Sentence order (participant)*		
	Week 1	Week 2	Week 3
1. People had been traveling onboard the ICE of Deutsche Bahn*.			
2. The tire of a wheel broke at a high speed.			
3. In the first wagon, a piece of the cracked wheel started to come up through the floor.			

4. No emergency stop got immediately initiated.			
5. According to the Deutsche Bahn policies, an emergency stop was only allowed after visual inspection.			
6. The broken wheel rim slammed against the guard rail of the next switch point.			
7. The switch point was close to an overpass bridge.			
8. The train was getting pulled away from the railway track.			
9. The back part of the train was being slammed against the road bridge.			
10. The bridge collapsed.			
11. Parts of the train got buried underneath it.			
12. Several cars on the bridge were crashed during the collapse.			
13. Of the train's wagons, most were either derailed.			
14. They were torn in half next to the bridge.			
15. Or they were crushed into the bridge by the back engine.			
16. Many of the wagons collided into the collapsed bridge like an accordion.			

17. It resulted in enormous material damage.			
18. People died or were injured, some critically.			
19. The failure was traced back to the design and testing of Deutsche Bahn because the wheel design decisions were only based on analysis and theory.			
20. Deutsche Bahn did not replace the wheels on time, even though they were being worn below the recommended standard in diameter.			
21. The emergency operation procedures of Deutsche Bahn contributed to the disaster as well.			
22. The placement of the switch contributed to the severity of the disaster.			
23. It was an inherent hazard for high-speed trains at the overpass bridge.			
24. Until today, it remains the worst rail disaster in the history of Germany.			
25. It is also considered the worst high-speed-rail disaster worldwide.			

Kiss Nightclub Disaster

Coding scheme content

		Week 1	Week 2	Week 3
Code		**Yes (1) No (0)**	**Yes (1) No (0)**	**Yes (1) No (0)**
	1. Contextual information (24)			
1.	1a) A major fire occurred at the Kiss nightclub			
2.	1b) The party was organized by students from universities.			
	1c) Against the club's capacity, it was packed with many people who paid for their ticket ahead*			
	1d) The fire started during the night at a show where outdoor pyrotechnics were used*			
3.	1e) It resulted in the material of the club's ceiling getting ignited			
	1f) A malfunctioning fire extinguisher.*			
4.	1g) The blaze spread throughout the packed club at lightning speed			
5.	1h) Thick, toxic smoke got emitted			
6.	1i) The fire started near the air conditioning system			
7.	1j) The dispersion of the toxic smoke got accelerated			
8.	1k) Those inside panicked as they tried to get out			
9.	1l) The toxic smoke made them lose their sense of direction			
10.	1m) They started to confuse the bathroom doors with the exit door			
11.	1n) Many people died as they either tried to hide in bathrooms			
12.	1o) Or in panic mistook them for exits			
13.	1p) Many bodies were removed from the bathrooms later on.			

14.	1q) The club not having an alarm system			
15.	1r) The club not having a sprinkler system			
16.	1s) The metal barriers used to keep people in line on their way inside			
17.	1t) A hole in the outer wall had to be made to allow more people to escape			
18.	1u) Many people were injured by the crush at the front door.			
19.	1v) They began to fall on top of each other.			
20.	1w) Many youngsters were killed or hospitalized for smoke inhalation and burns			
21.	1x) Dozens of youngsters were in critical condition			
22.	1y) One major problem after the tragedy was the lack of a specific antidote for the toxic smoke.			
23.	1z) Most of the victims were college students and died of smoke inhalation rather than burns.			
24.	1aa) The fire has the second-highest death toll for an entertainment event in Brazil.			
	2. Blunt end causes (4)			
1.	2a) Is 'the club's inflammable insulating foam material' mentioned?			
2.	2b) Is the 'faulty fire safety equipment' mentioned (including no alarm nor sprinkler system)?			
3.	2c) Is it mentioned that 'the club only had one emergency exit'?			
4.	2d) Is it mentioned that the metal barriers ended up blocking people from getting out?			
Total score (28) **___ out of 28**				

* Ambiguous statement: could be either sharp/blunt end or context, therefore left out for coding

Non-blunt end blaming – Just additional notes, not count in			
Blaming words			
	Week 1	**Week 2**	**Week 3**
Code	**Yes (1)** **No (0)**	**Yes (1)** **No (0)**	**Yes (1)** **No (0)**
Have any blaming words been used that were not mentioned in the text?			

Coding scheme order

Sentence order (original)	*Sentence order (participant)*		
	Week 1	Week 2	Week 3
1. A major fire occurred at the Kiss nightclub, Southern Brazil.			
2. The party was organized by students from universities.			
3. Against the club's capacity, it was packed with many people who paid for their ticket ahead.			
4. The fire started during the night at a show where outdoor pyrotechnics were used.			
5. It resulted in the club's ceiling getting ignited.			
6. A malfunctioning fire extinguisher.			

7. The blaze spread throughout the packed club at lightning speed.			
8. Thick, toxic smoke got emitted.			
9. The fire started near the air conditioning system.			
10. The dispersion of the toxic smoke got accelerated.			
11. Those inside panicked as they tried to get out.			
12. The toxic smoke made them lose their sense of direction.			
13. They started to confuse the bathroom doors with the exit door.			
14. Many people died as they either tried to hide in bathrooms.			
15. Or in panic mistook them for exits.			
16. Many bodies were removed from the bathrooms later on.			
17. The club had inflammable insulating foam material in the ceiling.			
18. It also had a faulty fire safety equipment.			
19. It had no alarm system.			
20. It had no sprinkler system.			
21. The club had only one emergency exit.			
22. Metal barriers used to keep people in line on their way inside.			

23. They ended up blocking people from getting out.			
24. A hole in the outer wall had to be made to allow more people to escape.			
25. Many people were injured by the crush at the front door.			
26. They began to fall on top of each other.			
27. Many youngsters were killed or hospitalized for smoke inhalation and burns.			
28. Dozens of them were in critical condition.			
29. One major problem after the tragedy was the lack of a specific antidote for the toxic smoke.			
30. Most of the victims were college students and they died of smoke inhalation rather than burns.			
31. The fire has the second-highest death toll for an entertainment event in Brazil.			

'The Who' Concert Disaster

Coding scheme content

		Week 1	Week 2	Week 3
Code		**Yes (1) No (0)**	**Yes (1) No (0)**	**Yes (1) No (0)**
	Contextual information (24)			
1.	1a) The band 'The Who' performed at the Riverfront Coliseum as part of their world tour			
2.	1b) 'The Who' were known as one of the most popular rock bands in the world.			
3.	1c) One of their band members died of a drug overdose one year earlier.			
4.	1d) The band embarked on a U.S. tour that included seven performances.			
5.	1e) The Riverfront Coliseum show was quickly sold-out			
6.	1f) The majority of the tickets sold as unassigned or general-assignment seating			
7.	1g) Many of the ticket holders rushed to secure first-come, first-served spots at the edge of the stage.			
8.	1h) Despite the near-freezing temperatures.			
9.	1i) According to news reports at the time, the doors were expected to open at 7 p.m.			
10.	1j) People were standing outside, focused at each of the doors.			
11.	1k) They started to grow restless.			
	1l) They heard a soundcheck*			
	1m) Only a pair of doors at the far right of the main entrance was opened to handle the crowd*			
12.	1n) The large crowd of fans started to turn into a panicked stampede			

13.	1o) The coliseum was privately owned at that time			
14.	1p) People at the back of the crowd started pushing forward			
15.	1q) Trapping the people in front			
16.	1r) Pushing them to the ground			
17.	1s) Several people tried to assist the fallen.			
18.	1t) They tried to protect them from further assault			
19.	1u) Additional ranks of crowd members fell on top of them or were forced over them			
20.	1v) With only a small part of the crowd getting inside			
21.	1w) The concert continued to take place			
22.	1x) Some people died since they were not able to breathe.			
23.	1y) A lot of people were injured during the stampede			
24.	1z) From there on, unassigned seating and first-come, first-served ticket sales have been banned, with minor exceptions, for the next years.			
2. Blunt end causes (4)				
1.	2a) Is 'the event managers decision for unassigned seating as they never experienced problems with it at previous concerts' mentioned?			
2.	2b) Is the 'the change of shifts created by the event managers' mentioned?			
3.	2c) Is it mentioned that 'no management plans of the large crowd were created ahead'?			
4.	2d) Is 'the police not having any legal authority to order the doors to get opened' mentioned?			
Total score (28) **___ out of 28**				

* Ambiguous statement: could be either sharp/blunt end or context, therefore left out for coding

Non-blunt end blaming – Just additional notes, not count in			
Blaming words			
	Week 1	**Week 2**	**Week 3**
Code	**Yes (1)** **No (0)**	**Yes (1)** **No (0)**	**Yes (1)** **No (0)**
Have any blaming words been used that were not mentioned in the text?			

Coding scheme order

Sentence order (original)	*Sentence order (participant)*		
	Week 1	Week 2	Week 3
1. The band 'The Who' performed at the Riverfront Coliseum as part of their world tour.			
2. 'The Who' were known as one of the most popular rock bands in the world.			
3. One of their band members died of a drug overdose one year earlier.			
4. The band embarked on a U.S. tour that included seven performances.			
5. The Riverfront Coliseum show was quickly sold-out.			

6. The majority of the tickets sold as unassigned or general-assignment seating.			
7. The event managers chose for this type of seating as they never experienced problems with it at previous concerts.			
8. Many of the ticket holders rushed to secure first-come, first-served spots at the edge of the stage.			
9. Despite the near-freezing temperatures.			
10. According to news reports at the time, the doors were expected to open at 7 p.m.			
11. People were standing outside, focused at each of the doors.			
12. They started to grow restless.			
13. They heard a soundcheck.			
14. Due to the change of shifts for the staff, there were not enough staff members to get all doors opened and occupied.			
15. Only a pair of doors at the far right of the main entrance was opened to handle the crowd.			
16. The large crowd of fans started to turn into a panicked stampede.			
17. No management plans of the large crowd were created ahead.			

18. The police did not have any legal authority to order the doors opened.			
19. The Coliseum was privately owned at that time.			
20. People at the back of the crowd started pushing forward.			
21. Trapping the people in front.			
22. Pushing them to the ground.			
23. Several people tried to assist the fallen.			
24. They tried to protect them from further assault.			
25. Additional ranks of crowd members fell on top of them or were forced over them.			
26. With only a small part of the crowd getting inside.			
27. The concert continued to take place.			
28. Some people died since they were not able to breathe.			
29. A lot of people were injured during the stampede.			
30. From there on, unassigned seating and first-come, first-served ticket sales have been banned, with minor exceptions, for the next years.			

Appendix G: Questions per session in Qualtrics

What is your (student) email address?

_____

First session

On the following page, you will be presented with the first story. Please read the story carefully twice. You will have 5 minutes in total to do so, but you can also advance to the next page yourself if you are earlier done. On the page itself, you will see a timer that indicates how much time is left. After the 5 minutes are over, the page will automatically switch to the next one.

Please click on the arrow below to continue.

In the following, you will have to complete a calculation task. You can see the starting number below this text. Please try to think aloud during this task by verbally repeating the first number, what you subtract from the number and what the result of each calculation is.

794

Start with 794 and count back by sevens, until the researcher says 'stop'. Please think aloud the whole time. You can start by reading out the example to the researcher.

Example: 794 - 7 = 787;

787 - 7 = ...

On the following page, you will be asked to write everything down that you remember of the ICE disaster nearby Hanover you just read.

Please click on the arrow below to continue.

Please write down everything that you remember of the ICE disaster nearby Hanover.

_____

Second session

Welcome back!

The second session of the experiment will be about what you remember of the three disasters that you read last week. Just as in the previous session, you will be asked to write down everything that you remember of each disaster.

On the following page, you will be asked to write everything down that you remember of the ICE Disaster nearby Hanover.

Please click on the arrow below to continue.

Please write down everything that you remember of the ICE disaster nearby Hanover.

_____

On the following page, you will be asked to write everything down that you remember of the Kiss Nightclub disaster.

Please click on the arrow below to continue.

Please write down everything that you remember of the Kiss Nightclub disaster.

_____

On the following page, you will be asked to write everything down that you remember of the 'The Who' Concert disaster.

Please click on the arrow below to continue.

Please write down everything that you remember of the 'The Who' Concert disaster.

Third session

Welcome back!

Today I would like to find out once again what you remember of the three texts that you read three weeks ago. Just as in the previous two sessions, you will be asked to write down everything that you remember of each disaster. Afterward, I would like you to fill out a few more questions regarding the different disasters, a short questionnaire and a few demographical questions.

On the following page, you will be asked to write everything down that you remember of the ICE Disaster nearby Hanover.

Please click on the arrow below to continue.

Please write down everything that you remember of the ICE disaster nearby Hanover.

On the following page, you will be asked to write everything down that you remember of the Kiss Nightclub disaster.

Please click on the arrow below to continue.

Please write down everything that you remember of the Kiss Nightclub disaster.

On the following page, you will be asked to write everything down that you remember of the 'The Who' Concert disaster.

Please click on the arrow below to continue.

Please write down everything that you remember of the 'The Who' Concert disaster.

_____

Responsibility questions Blunt end blaming Present

ICE Disaster nearby Hanover

Please indicate to what extent you feel that each of these factors were responsible for causing the ICE disaster nearby Hanover.

	Not at all responsible	Slightly responsible	Moderately responsible	Very responsible	Extremely responsible	× Not applicable
The train conductor not considering the vibrations as severe	○	○	○	○	○	○
The train manager insisting on investigating the damage before stopping the train	○	○	○	○	○	○
The passenger being in shock	○	○	○	○	○	○
The passenger reporting the damage	○	○	○	○	○	○
Poor design and insufficient testing of the wheels of Deutsche Bahn	○	○	○	○	○	○
Deutsche Bahn not replacing the worn-down wheels ahead, even though they knew about it	○	○	○	○	○	○
The flawed and ineffective emergency operation procedures of Deutsche Bahn	○	○	○	○	○	○
The inconsiderate placement of the switch at an overpass bridge	○	○	○	○	○	○

Kiss Nightclub Disaster

Please indicate to what extent you feel that each of these factors were responsible for causing the Kiss Nightclub disaster.

	Not at all responsible	Slightly responsible	Moderately responsible	Very responsible	Extremely responsible	× Not applicable
The security guards letting too many people into the club that paid for the ticket ahead	○	○	○	○	○	○
The band working with cheap outdoor fireworks	○	○	○	○	○	○
The malfunctioning fire extinguisher and faulty fire safety equipment (no alarm nor sprinkler system)	○	○	○	○	○	○
The security guards not letting people out because they could not evaluate the situation and acted according to the regulation	○	○	○	○	○	○
The barkeeper pointing people towards the exit but leading to confusion with the bathroom doors	○	○	○	○	○	○
The club's poor, inflammable insulating foam material	○	○	○	○	○	○
The poorly designed club having only one exit	○	○	○	○	○	○
The inconsiderately placed metal barriers for keeping people in line on their way in blocking them from getting out	○	○	○	○	○	○

'The Who' Concert Disaster

Please indicate to what extent you feel that each of these factors were responsible for causing the 'The Who' Concert disaster.

	Not at all responsible	Slightly responsible	Moderately responsible	Very responsible	Extremely responsible	× Not applicable
The event managers' inconsiderate decision of unassigned/general-assignment seating	○	○	○	○	○	○
The event managers' ill-conceived change of shifts leading to short-staffed security and ticket takers	○	○	○	○	○	○
The security staff and ticket takers deciding to only open a pair of doors to handle the crowd	○	○	○	○	○	○
The band performing sound checks when the doors should get opened	○	○	○	○	○	○
No well-thought-out management plans of the large crowd created ahead	○	○	○	○	○	○
The police officers not directly intervening	○	○	○	○	○	○
The mistakenly missing authority of police officers having the doors get opened	○	○	○	○	○	○
The band manager withholding information from the band about the incident until after the show	○	○	○	○	○	○

Responsibility questions Blunt end blaming Absent

ICE Disaster nearby Hanover

Please indicate to what extent you feel that each of these factors were responsible for causing the ICE disaster nearby Hanover.

	Not at all responsible	Slightly responsible	Moderately responsible	Very responsible	Extremely responsible	× Not applicable
The train conductor not considering the vibrations as severe	○	○	○	○	○	○
The train manager insisting on investigating the damage before stopping the train	○	○	○	○	○	○
The passenger being in shock	○	○	○	○	○	○
The passenger reporting the damage	○	○	○	○	○	○
The design and testing of the wheels of Deutsche Bahn	○	○	○	○	○	○
Deutsche Bahn not replacing the worn-down wheels ahead	○	○	○	○	○	○
The emergency operation procedures of Deutsche Bahn	○	○	○	○	○	○
The placement of the switch at an overpass bridge	○	○	○	○	○	○

Kiss Nightclub Disaster

Please indicate to what extent you feel that each of these factors were responsible for causing the Kiss Nightclub disaster.

	Not at all responsible	Slightly responsible	Moderately responsible	Very responsible	Extremely responsible	× Not applicable
The security guards letting too many people into the club that paid for the ticket ahead	○	○	○	○	○	○
The band working with cheap outdoor fireworks	○	○	○	○	○	○
The malfunctioning fire extinguisher and fire safety equipment (no alarm nor sprinkler system)	○	○	○	○	○	○
The security guards not letting people out because they could not evaluate the situation and acted according to the regulation	○	○	○	○	○	○
The barkeeper pointing people towards the exit but leading to confusion with the bathroom doors	○	○	○	○	○	○
The club's inflammable insulating foam material	○	○	○	○	○	○
The club having only one exit	○	○	○	○	○	○
The metal barriers for keeping people in line on their way in blocking them from getting out	○	○	○	○	○	○

‘The Who’ Concert Disaster

Please indicate to what extent you feel that each of these factors were responsible for causing the ‘The Who’ Concert disaster.

	Not at all responsible	Slightly responsible	Moderately responsible	Very responsible	Extremely responsible	× Not applicable
The event managers’ decision of unassigned/general-assignment seating	○	○	○	○	○	○
The event managers’ change of shifts leading to short-staffed security and ticket takers	○	○	○	○	○	○
The security staff and ticket takers deciding to only open a pair of doors to handle the crowd	○	○	○	○	○	○
The band performing sound checks when the doors should get opened	○	○	○	○	○	○
No management plans of the large crowd created ahead	○	○	○	○	○	○
The police officers not directly intervening	○	○	○	○	○	○
The missing authority of police officers having the doors get opened	○	○	○	○	○	○
The band manager withholding information from the band about the incident until after the show	○	○	○	○	○	○

Was there an event recently that made you feel being more or less in control of your life?

- Yes, something happened where I felt that I had control over
- Yes, something happened where I felt that I had no control over
- No

What is your gender?

- Male
- Female
- Other

What is your age?

_____

What is your nationality?

- Dutch
- German
- Other, namely _____

What is your current level of education?

- Bachelor
- Master
- PhD
- Other

What is your study program/working field?

_____

Well done, you finished the experiment! Thank you again for your participation.

Please click now on the arrow below to finish the last session of the experiment.

Appendix H: Example visualization of the Zeebrugge accident