



# Media's role after a nuclear accident

Differences in news coverage between Japan and Sweden after the Fukushima disaster 2011

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Medias roll efter en kärnkraftkatastrof

Skillnader i nyhetsrapportering mellan Japan och Sverige efter Fukushima-katastrofen 2011

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Datum: 2017-06

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## ABSTRACT

### Introduction

Through the ages, nuclear emergencies have scared us several times, and during these emergencies risks were often communicated through media. Sometimes, news would get distorted, amplified and cause confusion or other undesirable effects, which in turn might affect how people perceive the risks. The aim of this study was to analyze how media portrayed and communicated risks in Japan during the Fukushima nuclear power plant accident in 2011, compared to Sweden, a country out of reach of direct risks.

### Methods

Discourse analysis was considered the most suitable method for this study, since it can be used to reveal myths that are implicated in speech and other actions. A discourse analysis is not meant to clarify an objective reality, but how a reality is created. The analysis was conducted on articles published in newspapers in each country during the accident, 15 articles from The Japan Times (Japan) and 19 from Aftonbladet (Sweden).

### Results

The results showed that the communication of risks was more instructive in The Japan Times, even if some of the information was changing and could be considered confusing. When it comes to feelings, The Japan Times mostly stayed away from vivid and dramatic messages, while this was more common in Aftonbladet.

### Discussion and conclusions

In the discussion, it was found that the most prominent resemblance was lacking information as a result of potential lack of knowledge among journalists. The way the newspapers presented the risks differed, The Japan Times had a quite composed approach while Aftonbladet dramatized the event more extensively. Both newspapers used statements from officials and authorities, which might have contributed to framing. For further research on media's role during a nuclear disaster, it might be of interest to look at solutions for how experts and journalists can work closer together to communicate the risks accurately, as well as taking the political stance aspect into consideration.

**KEY WORDS:** risk communication; Fukushima news coverage; media; risk perception; nuclear accident

## SAMMANFATTNING

### Introduktion

Kärnkraftolyckor har skrämt oss ett flertal gånger genom tiderna, och under dessa olyckor kommuniceras ofta risker genom media. Nyheter blir emellanåt förvridna, förstörade och skapar förvirring eller andra oönskade effekter, vilket i sin tur kan påverka hur riskerna upplevs. Syftet med den här studien var att analysera hur media framställde och kommunicerade risker i Japan under kärnkraftolyckan i Fukushima 2011, jämfört med Sverige som är ett land tillräckligt långt bort för att påverkas av direkta risker.

### Metod

Eftersom diskursanalys kan användas för att visa myter som döljer sig i språk och andra handlingar, ansågs detta vara en passande metod för studien ifråga. En diskursanalys används inte för att klarlägga en objektiv verklighet, utan snarare hur en verklighet skapas. Analysen utfördes på artiklar publicerade i nyhetstidningar i Japan och Sverige under tiden för olyckan, 15 artiklar från The Japan Times och 19 från Aftonbladet.

### Resultat

Resultatet visade att kommunikationen av risker var mer instruerande i The Japan Times än i Aftonbladet, även om en del av informationen förändrades och kunde vara förvirrande. När det kommer till känslor höll sig The Japan Times mestadels undan från beskrivande och dramatiska meddelanden, medan detta ofta förekom i Aftonbladet.

### Diskussion och slutsatser

I diskussionen framkom att den främsta likheten bestod av bristande information, på grund av eventuell bristande kunskap hos journalister. Aftonbladet dramatiserade händelsen, medan The Japan Times höll tillbaka. Båda tidningarna använde uttalanden från tjänstemän och myndigheter, vilket kan ha lett till framing. Vidare forskning gällande medias roll vid kärnkraftolyckor skulle kunna inkludera lösningar på hur experter och journalister kan samarbeta för att kommunicera risker korrekt, samt studera vidare på vilken påverkan politisk ställning kan ha.

## ACKNOWLEDGEMENTS

On March 11 in 2011, I was on the sixth floor of an old building in Tokyo attending Japanese class, when everything started shaking furiously. I only experienced a fragment of all the horrific events that would follow, but it is something that has set a mark in me for life. This experience, in addition to having a strong bond to Japan, is partly what inspired this study.

I would like to thank Magnus Johansson for support and supervision, and for being very understanding and helpful about the time difference, since I spent the time writing this in Japan. Also a big thank you to my host parents in Japan for always providing me with a second home, my family in Sweden for endless support and my friends in different places around the world for being there and giving me advice.

Finally, I would like to send a thought to all the people who lost their lives, loved ones, homes, and are still suffering from the tsunami, earthquake and the Fukushima accident on March 11, 2011.

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2017.06.09.

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## 1. INTRODUCTION

Sometimes risks are so unlikely that their effects can overthrow the current perception of how reality is constructed; these risks are also referred to as black swans. The expression dates back to when Europeans first came to Australia with the belief that all swans are white, only to realize that this was not the case; black swans existed as well. This shows that humans are limited in their acquisition of knowledge through observation and experience (Sonnsjö & Mobjörk, 2013). For a long time humans have tried to understand ontology (what exists) and epistemology (how knowledge is acquired), leading to the problem of whether reality is shaped by knowledge or vice versa (Brown, 2015). Nuclear emergencies have scared us several times through the ages, with Three Mile Island, Chernobyl, and Fukushima being three events that have made a particular impact. During a nuclear emergency, the media becomes a communication source to the public regarding risks and updates of the situation. In our modern world, using media as a risk communication tool during an emergency is necessary in order to quickly reach out to the public. Even though there are considerable benefits in using the media this way, there is also a high risk of news being distorted or amplified, causing confusion and other undesirable effects (Renn, 1990; Friedman, 2011). According to Brown (2015), cable channels are characterized by the strive to create emotions among the viewers. Because of news anchors at these channels telling stories in a skilled, expressive manner, viewers have difficulty understanding, which in turn causes fear and anger.

The main purpose of informing the public about nuclear emergencies is to care for the life and health of the population and environment, rather than satisfy the needs from media (Prezelj et al, 2016). During the Chernobyl disaster in 1986, disagreements between science institutions were amplified by the media. The media also took part in the speculations about potential health effects, causing discomfort and skepticism among the public due to overreacting and overemphasizing inconsistency of official recommendations. However, in the case of Chernobyl, these phenomena were not invented by the media, but were a truthful representation of what was happening. What media did during this time was simply give a reflection of what the situation actually looked like in most countries. The media were blamed for causing confusion and making mediation of the health threat's actual severity more difficult. Despite the media's emphasis on the weaknesses within risk management and obvious contradictions in risk communication, making the feeling of confusion and frustration worse, they were only amplifying actual events. Hence, in this case, the lack of management response was in this case not because of biased media or insufficient confidence in management institutions, but due to the management institutions not performing in a satisfying manner (Renn, 1990).

Friedman (2011) compared the nuclear accidents at Fukushima, Chernobyl, and Three Mile Island, and concluded that because they all involved complex technical situations, it was difficult for engineers and government spokespersons to avoid using technical jargon in their explanations. Furthermore, as a result of reporters not having enough technical knowledge within the nuclear field, they had difficulty knowing what kind of questions they should ask. Reporting about nuclear accidents is a delicate matter, since people want to know about potential health hazards and radiation. In addition to the public fear of radiation, the need to use certain terminology in addition to public fear of radiation makes it inherently complex.

Both traditional and social media were criticized by scientists and others with technical knowledge for using scare tactics and making the public's fear of nuclear power worse (Friedman, 2011). When risks are being communicated to the public, the media should have the role of protecting the public interest, which can be achieved by providing high quality information (Lemyre, 2010).

Before the Fukushima accident, nuclear risk communication was neither participatory nor transparent, which shows the importance of improving the risk communication procedure. In Japan, the public did not trust the information they received because of a top-down approach to risk communication, as well as the close connection between the government and industry (Nihlén Fahlquist & Roeser, 2015). According to Hasegawa (2011), trust towards the official government and media reports regarding 'safety' has disappeared, especially for mothers in Fukushima, Miyagi, and other prefectures within the Tokyo metropolitan area.

### 1.1. Aim of the study

This study aims to analyze how risks were portrayed at the location of a nuclear accident, compared to a country out of reach of direct risks. The Fukushima nuclear accident in Japan will be used as case study and Sweden will be the country of comparison. Despite the fact that the Fukushima accident occurred far away from Sweden and there was no immediate danger to Sweden, it was still covered extensively in Swedish media. The media take on a major role in the construction of reality and how the public perceive risks. Since Sweden did not need information about the direct risks related to the accident, it is of interest to analyze whether the Swedish media used the accident to entertain the audience or actually report about the risks connected to the event.

To the Swedish audience, the event was primarily a news subject, but in Japan it was also about risk communication. Therefore, it is relevant to make a comparison between how the media in these respective countries portrayed the accident from a risk communication point of view, and from an emotional perspective (i.e. what kind of feelings the media aimed at arousing). Rather than finding an absolute answer, the purpose is to contribute to the discussion regarding how the media is using its position as both a channel for risk communication and as a business. After all, the media are highly dependent on their viewers and readers.

Therefore, the aim of this study is to examine if there are any differences to be found regarding how risks were communicated in Swedish media compared to Japanese media, during the aftermath of the Fukushima Daiichi nuclear accident in 2011. Furthermore, it will look at how media presented risks and whether there are any indications of the media trying to play on the audience's feelings to gain viewers and make more profits.

### 1.2. Research question

In what ways did the media presentation of risks differ between Sweden and Japan after the Fukushima disaster in 2011?

Are there any indications of the media using their position as a source for risk communication to gain viewers?

## 2. BACKGROUND

### 2.1. Risk communication

Risk in a theoretical sense is a social construction. The mention of risk insinuates the possibility of some danger related to the subject discussed, which means there is reason to avoid or at least be careful about it. This is also true within risk communication, since talking about risk insinuates that there is reason for the audience to believe they might have something to lose when it comes to the subject being discussed (Thompson, 2012). Risk communication usually refers to communicating hazards that might occur; crisis communication, however, refers to the communication during and after a hazard has occurred. This does not mean that crisis communication is completely separated from risk communication, since risk communication might also include messages regarding how to respond to a hazard (Sato, 2014). In this study, only the term risk communication will be used, considering the fact that crisis communication is somewhat incorporated in the term. Hence, both the meaning of crisis communication and risk communication will be considered covered by the term 'risk communication'.

William Leiss (1996) defines risk communication as:

"The flow of information and risk evaluations back and forth between academic experts, regulatory practitioners, interest groups, and the general public." (Leiss, 1996:86).

Social communication, practical management, and policy-making are three important pieces in the process of risk communication. Furthermore, for the purpose of influencing attitudes and behavior, as well as acting in a correct manner when there is an emergency or crisis, risk communication includes different activities to inform and educate the public regarding risk and risk management (Boholm, 2008). Spreading information about risks to the public is the purpose of risk communication (Roeser, 2012). Emotions can be used for manipulation (and marketing experts approve of this), but they are not a desirable tool for responsible risk communication. With risk communication comes the moral responsibility to perform it ethically in order to create trust between the public and the communicator (for example, a government, a strong agency, or a corporation). Ethical risk communication is also necessary for normative reasons, not only instrumental ones. The way the audience is affected is directly impacted by the way of presenting or framing risks in messages, and these messages might trigger different types of moral emotions (Nihlén Fahlquist & Roeser, 2015).

Common charges regarding the risk communication process include: (1) media bias or sensationalism; (2) advocates distorting or being selective with information; (3) hidden agendas or standpoints that are not rational; and (4) regulatory agencies failing to communicate important information to the people in a language they can understand (Leiss, 1996). A message is sent out to a transmitter or straight to the receiver, by an information source. This message consists of a cluster of signals that the transmitter or receiver must decode in order to understand it. Every time a transmitter decodes a message, the original one is being altered by intensification or attenuation. The message is being interpreted, assimilated, and evaluated by the receiver, but is also being structured by the transmitter. Thus, the transmitter is a new source of information, that might transcribe the original message into a new message. This means that signals going through a transmitter might be

amplified during both the reception and in the recoding (Kasperson et al, 1988). Because of different socially-influenced attenuations or amplifications of the risk signal, risk messages might get distorted. These means of socially-induced attenuations or amplifications can be caused, for example, by the media, industry, interest groups, academics, or stakeholders (Boholm, 2008).

According to Lemyre (2010), how well the public understand a situation depends on how they perceive events. If they understand the situation well, they are also more likely to act in a more resolute and adapted manner. In some cases, it might seem that the public is acting irrationally and out of panic—for example, when escaping from an actual physical threat. However, this is a normal kind of behavior because it is the rational way to react when facing such a threat. In most cases people want to act in a purposeful way, but it might turn out poorly if they are not fully informed of the situation.

## 2.2. Risk Perception

If there is no objective foundation upon which to base belief, we must simultaneously take responsibility and construct a foundation, in order to construct truths. Our ideas of what is rational and appropriate can be found in the truths that we construct. However, since no absolute principles can be applied across contexts, constructivist arguments lead to a radical relativism making it impossible to make a clear distinction between what is appropriate and what is not. The public must be ready to constructively take part in the scientific and technological controversies, since these are becoming increasingly important from both a national and international perspective (Waddell, 1990).

The way people perceive risk is highly dependent on where they live and what position they have in society. When people perceive a risk wrongly or in a misleading way, it is considered a major vulnerability factor. If not enough information is provided, people tend to perceive risks differently and make incorrect decisions (Neumann & Lavino, 2010). Risk perception is not merely determining the odds of a certain hazard and its effects; it is much more multi-dimensional, which can be seen in different definitions and complex aspects of risk perception; it is built on psychological and cognitive processes, but it also goes further than the intrapersonal domain to incorporate social and cultural contexts through shared values, customs, and languages. Thus, risk perception goes beyond individual cognition and is a social construction based on sociocultural values and practice (Sato, 2015).

Despite experiencing the same risk, people might perceive it differently. This in turn may lead to different reactions and varying degrees of concern regarding the risk. In addition, there is no guarantee that the public will have the same perception of a risk as what is considered the objective standard or how it is evaluated by experts. People's risk perception can be affected by several different factors: what information is distributed and the way the risk is processed mentally are two of these factors. Moreover, qualitative characteristics—such as voluntariness, fear, familiarity, controllability, and seriousness of the consequences—also play a big role in the perception of risks. Risks may be perceived as more dangerous when they give a sense of not being controllable, when they could potentially lead to a global catastrophe or cause negative impacts on future generations. These are risks that are not easily reduced and fall upon people involuntarily. Further factors include risks that cannot be

observed, risks that are new to the people being exposed, and how much knowledge there is regarding the risk (Neumann & Lavino, 2010).

### 2.3. Risk in media

When communicating risks related to nuclear emergencies to the public, it is important that the information is clear, consistent, and coordinated. In these situations, media constitute a part of the process and are among those who can understand the needs of emergency communication. One of the problems about media is that it is not about one-way communication and the fact that inconsistent and uncoordinated news will be published makes it a complex area, which will likely lead to coordinated messages becoming unclear (Prezelj et al, 2016). Lazic and Kaigo (2013) note that if the news we receive is a product negotiated between news producers and sources, it might be of interest to consider what responsibility the sources hold regarding reporting being misleading and inaccurate. As of now, this duty is mostly attributed to journalists.

When it comes to what is presented in news, it is not solely elites who are the main drivers; journalists also use their senses to figure out what they feel is important to mediate to the audiences. Information is often influenced by a circular process that includes journalists, public opinion, and elites (Park et al, 2016). Within social science, it is given that the making-process of social products will be reflected in the products themselves. In this sense the politics of fear is included in the process and is thus reflected in fear; the product. Because we do not have much knowledge regarding what stretches beyond what is mass mediated, mass media is highly significant in the process as well. The way risk communication messages are presented—their character, structure, and effectiveness—is largely dependent on the media (Altheide, 2010).

Individuals construct meaning and journalists (as well as other cultural entrepreneurs) create meaning in public discourse. These processes are integrated with each other in the sense that media discourse has a part in the individual construction of meaning, and public opinion has a part in how journalists and others construct meaning in public discourse. The media is not only using the audience for their own purposes—the audience is also using media discourse to construct meaning, no matter how dependent they are on it. Instead of only one public discourse, a set of discourses should be considered as interacting in a complex manner. When it comes to nuclear power, journals and various print media with a focus on those professionally involved in the issue are being used by the specialist's discourse (Gamson & Modigliani, 1989). If the media have access to high quality information, it is less likely that journalists will jump to conclusions, exaggerate the facts, or claim that government officials to be hiding things (Lemyre, 2010).

Because many risks are not experienced first-hand, individuals may learn about them from other people or through the media. Therefore, the flow of information turns into a key factor of amplification and plays an important part in public response. The volume, extent of conflict, how much dramatization is brought in and the symbolic connotations of the information are all factors that might influence the social amplification of risk (Kasperson et al, 1988). Public risk perception and risk behavior are affected by how psychological, social, and cultural processes are working in relation to risk events. The term 'social amplification of

risk' refers to the social structures and processes of risk experience, how individual and group perceptions are being affected, and what effects these responses have on community, society, and economy (Neumann & Lavino, 2010).

The way a risk is presented is very important when it comes to how it will be perceived and understood. If a risk is not presented in a very clear way it might cause distortions, misunderstanding, and biases. This concept is closely related to framing (Roeser, 2012). Framing theory is based on the fact that an issue can have different implications for several values or considerations, depending on the perspective from which it is viewed. People create a certain conceptualization or change their way of thinking regarding an issue, and it is this process that is called framing (Chong & Druckman, 2007). When specific issues are presented in mediated communication, it is common to bring framing research into the discussion. In addition to this, language and linguistic elements are also often used when presenting a particular issue (Benert & Beier, 2016).

Kasperson and colleagues (1988) state that dramatization is a great source of risk amplification. During the Three Mile Island accident, people living close to both the plant and other places were scared by reports saying an explosion could occur within the coming two days, which would cause a release of radioactive material. Furthermore, sensational headlines related to the Chernobyl accident led to the incident becoming more memorable and nuclear power to be perceived as potentially catastrophic.

#### 2.4. The Fukushima accident

The 2011 breakdown of the reactor at Fukushima Daiichi nuclear power plant in Japan is so far the second largest nuclear power plant failure since the disaster in Chernobyl, Ukraine in 1986 (Najih & Yanai, 2013). The Fukushima accident included both loss of cooling capabilities and explosions, and significant amounts of radioactive materials were released (Hasegawa, 2014). The entire situation was very complex, considering the fact that it involved earthquakes, tsunamis, and a nuclear accident. The disaster came to be one of the biggest industrial crises worldwide, and, mediated through the global news system, it became the Japanese equivalent of Chernobyl. The name 'Fukushima' is now instantly associated with nuclear disasters. Furthermore, the disaster caused other countries to worry about domestic nuclear risks, and focus soon changed to a nuclear angle instead of death tolls and human suffering (Lazic & Kaigo, 2013). Friedman (2011) stated that news in the aftermath of the Tohoku earthquake and tsunami ended up in the shadow of the coverage of the nuclear accident at Fukushima. Moreover, because of the large-scale coverage, the Fukushima nuclear accident has changed how the public receives information regarding significant nuclear plant accidents, as well as the effects and complications from such accidents.

The course of events was covered by media, which continuously showed clips of explosions and fires at the Fukushima nuclear power plant. The communication development gave the impression that the decision-makers in charge were not able to control the situation, and were aware of the problems, but were trying to hide them. At first, the problems were denied by the power plant's management and the public were assured that there was nothing to be worried about. However, the management later admitted to not having the situation under control and acknowledged that it kept getting worse. There strong deficiency in control, as well as

openness and honesty regarding the company's ability to communicate, also led to questions about whether the company was suitable to conduct nuclear power production at all (Mral & Vigsø, 2014).

Authorities in Japan did not ensure that Tokyo Electric Power Company (TEPCO) was prepared for a crisis and the ones responsible at all levels at both the authorities and TEPCO seemed to be disconcerted. The government was not informed about the problems, which in turn led to the government not being able to communicate information to the public, because they did not want to cause panic. During the process, there was no clear conception as to what was happening and no one was actually in control of the situation. Thus, the information delivered would be inaccurate, unreliable, and untimely (Mral & Vigsø, 2014).

## 2.5. Risk communication and media coverage in Japan

Mass media around the world served as the primary source of information to the general public during the accident (Prezelj et al, 2016). Problems with the sources affected the information provided by different levels of government and agencies within Japan in terms of accuracy, credibility, and understanding (Lazic & Kaigo, 2013). A case study by Najih and Yanai (2013) showed that the BBC frequently covered the responses of Japanese people to government policy and the work TEPCO was doing to find a solution to the crisis. Because the information provided by the government tended to contradict the reality the people were experiencing, there was a tendency to not believe such information. After the earthquake, the government stated that all nuclear power plants were stable, but it turned out the cooling system of the Fukushima nuclear power plant had failed. Furthermore, the government stated that there was no radiation leak, but there was a drastic increase of radiation in the area around the plant (Najih & Yanai, 2013).

When it comes to news media, they not only provide information, but they also take an active part in the construction process and mediation of natural and human-induced accidents. When newspapers quoted experts with contradicting opinions during the Fukushima accident, the information was framed as conflicting, which in turn might have made a difference in people's understanding and making sense of the news (Lazic & Kaigo, 2013). A study by Nogami and Yoshida (2014) showed that television and social networking sites had low credibility during the time of the Fukushima disaster and East Japan earthquake and tsunami. This implies that even during an emergency, people have enough sense to understand which source of information they should rely on, regardless of whether the information comes from public or private sources. Furthermore, Tateno and Yokoyama (2013) stated that due to attitudes regarding the release of information, the extent of public trust changed when it came to information providers, such as journalism, the government, and experts. Because of rumors and false information frightening the audience, it became more difficult to evaluate trustworthiness and scientific soundness of the information provided on the Internet.

The internet might seem convenient when communicating information regarding risks during an emergency, however, but the Fukushima accident shows the contrary. Because information did not reach the experts themselves, messages became confusing and contradictory (Nihlén Fahlquist & Roeser, 2015). In Japan communication chains are long and bureaucratized and information is centralized. In addition, the situation in the nuclear energy sector might have

caused information to be inconsistent and incomplete. The so-called 'nuclear village', which refers to the close connections between government regulators and nuclear facilities, kept past problems secret and this characterized the flow of information. Compared to Chernobyl, the news cycle today is more accelerated and news updates are more constant (Lazic & Kaigo, 2013). During previous nuclear events, a common mistake has been the media and public receiving inconsistent information from various official sources at different levels. This was also true for the Fukushima accident with Japanese official sources, such as TEPCO and the government, communicating information regarding the severity of the situation (Prezelj et al, 2016).

## 2.6. Risk communication and media coverage in Sweden

During the accident, the main voice in Sweden was Strålsäkerhetsmyndigheten (the Swedish Radiation Safety Authority), publishing 50 press releases between March 11 and March 30, 2011. The press releases mainly concerned updates regarding the situation in Japan, advice to Swedes living in both Sweden and Japan, and descriptions of Strålsäkerhetsmyndigheten's mission. In their updates, the authority only included validated information regarding, for example, radiation levels, the fire, and weather forecasts. They did not include any of their own speculations and all the assessments were heavily based on facts. Because of questions from journalists or the public, they also released very specific, direct, and short technical descriptions (Mral & Vigsø, 2014).

Strålsäkerhetsmyndigheten used the situation to improve their image as an engaged organization, all while addressing public fears and using scientific arguments to calm the people. They did this by emphasizing their scientific knowledge and their willingness to complete their mission of answering to both the country and the people (Mral & Vigsø, 2014).

In their study comparing media coverage in Sweden and Germany, Mral and Vigsø (2014) argue that the Fukushima accident caused great insecurity, information need, and fear regarding risks related to nuclear power. Such a situation requires the media to give the public the support they need to create a versatile picture of what is happening, but also to be concerned about what feelings they might stir up. German media were more prone to be consent to fear and create fear, while Swedish media made an effort to not cause feelings of fear. Another difference lies in the fact that scientists from Strålsäkerhetsmyndigheten would not get particularly disputed when they made appearances. Conversely, German journalists were more critical towards their experts and would question them on their statements (Mral & Vigsø, 2014).

In their conclusion, Mral and Vigsø (2014) state that, regarding some societal issues, the formation of opinion might develop from the majority opinion being on top of the debate and the minority not even getting a chance to express their opinion at all. The minority's opinion might not only appear factually wrong but also morally doubtful when the issue of split opinions concerns a moral question. One difference between Sweden and Germany is that in Germany it is considered morally questionable to advocate nuclear power, while in Sweden it has become almost odd to advocate against nuclear power. This phenomenon can affect journalists and how they decide who to interview and what approach they will take,

especially during an emergency characterized by insecurity. According to Mral and Vigsø (2014), this was more prominent in Sweden than in Germany. Most of the voices of critics were not heard and experts that were given space all expressed reassuring statements.

## 2.7. Risk communication and media coverage in other countries

Kepplinger and Lemke (2016) conducted a study in which media coverage of the Fukushima disaster in Germany, Switzerland, France and the United Kingdom were compared. According to this, German press concentrated strongly on the risks concerning nuclear energy in Germany and published more articles regarding nuclear energy than the French press. None of the four countries examined in this study reported much about the specific causes for the Fukushima disaster. This included external factors, the tsunami, as well as internal factors and the fact that measures taken to protect the reactor were inadequate. This means that in these countries, there was no real emphasis on the uniqueness of the situation in Fukushima. Kepplinger and Lemke (2016) came to the conclusion that by emphasizing events that supported their own position, as in what the Fukushima disaster meant for the national nuclear industry, mass media played a major part in the mediatized conflict regarding what the future of nuclear energy is going to look like. This was especially true for Germany, where that conflict existed before the catastrophe as well.

Park and colleagues (2016) compared post-Fukushima nuclear news in U.S. and German press. In *The New York Times*, the Fukushima disaster was depicted as an isolated incident caused by a natural disaster and failure in regulation by the Japanese government. On the other hand, German press presented concerns connected to nuclear energy that went further than risk and crisis. In modern states, it is common for the media to present subjective reporting to a certain point and, among the countries included in a study by Prezelj and colleagues (2016), the results showed that one-third of the information on the Fukushima accident was of this nature. It is natural for media to be subjective and show different points of view, since this will lead to more readers and bigger influence (Prezelj et al, 2016). According to Renn (1990), overreaction and apathy are probable responses to a nuclear crises, even if certain measures are implemented to prevent this.

A study by Tomkiv and colleagues (2016), analyzing news coverage from the Fukushima accident in European and Russian newspapers, found that among the articles, 19% had mistakes and misrepresentations regarding radiation risk information. Making references to norms that do not exist, or using inappropriate norms, was one of the most frequent misrepresentations. A lot of the articles also mentioned 'norm' or 'normal level'. However, they did not provide an explanation as to what a 'normal level' actually means. Moreover, they mention the complex problem concerning journalists making comparisons to previous nuclear accidents such as Three Mile Island and Chernobyl. They state that using Chernobyl as a benchmark for comparison without making the differences very clear is especially problematic and might be considered sensationalism. Because of the many mistakes made by journalists in the newspapers, it might be suggested that experts were not clear and did not provide enough context in their communications. In addition, journalists most probably did not have enough knowledge about radiation issues. This led to journalists not being able to give proper explanations or make sure their information was correct.

### 3. METHODS

#### 3.1. Method of choice

Through language, we create representations of reality that are not only reflections of an already existing reality, but also help create it. The physical world does also exist, but it receives meaning through discourse. In a discourse analysis, the point is to map out the processes within which we struggle about how to clarify the meaning of the signs, and where certain definitions are considered natural because they have been conventionalized. Discourse is a temporary fixation of definitions, a definition might be fixed temporarily but that does not necessarily mean it must stay that way forever. The analysis is not meant to clarify an objective reality, but rather to clarify how a reality is created and becomes an objective and obvious surrounding. Language structure, society, and identity are constantly changing and can never be fully established (Winther Jørgensen & Phillips, 2000).

Fundamentally, a discourse analysis is used to examine what social consequences might occur depending on how the surrounding reality is depicted. The benchmark consists of the fact that discourses constitute objects in a certain way by depicting the world in one way and not the other. They also create borders between true and false, and make some actions relevant and others unacceptable. Discourse analysis is meant to reveal myths that are implicated in speech and other actions regarding the society as an objective reality. Some myths will appear as objectively true and others as impossible, and this may be analyzed. Furthermore, it is possible to analyze how certain myths are being attributed by different actors trying to establish their own image of society (Winther Jørgensen & Phillips, 2000). This study aims at finding out how risks related to the Fukushima accident were depicted in Swedish and Japanese media; in other words, how the media contributed to the public's construction of those risks. Considering this, a discourse analysis was the most suitable method because it allows the researcher to look further than, for example, a content analysis.

#### 3.2. Presentation of method

During a discourse analysis, the researcher is at most times tied to some kind of discursive structuring and should strive to show the discourses 'the way they are'. However, it is impossible to actually leave the discourses and claim the pure truth, since the truth is always a discursive construction. How texts are produced and consumed is considered an important way of social practice that contributes to constituting the social world, including social identities and social relations (Winther Jørgensen & Phillips, 2000).

Using an order of discourse as frame makes it possible to circle out a group of discourses for analysis in the study. Furthermore, it is also possible to observe the distribution of discourses within the order of discourse because everyone does not have the same access to all discourses. News channels on TV often incorporate comments from people who are not journalists in their features, yet some will be seen as experts and others will be considered non-experts. 'Experts' might make statements with authority and claim that what they say is 'the truth', while comments from 'non-experts' will rather be seen as opinions and not as truths. By setting an order of discourse as frame for the study, it is possible to circle out a group of discourses for the analysis (Winther Jørgensen & Phillips, 2000). This was the first step of the analysis, and to identify relevant discourses for the analysis, all articles were read through thoroughly several times.

### 3.3. Presentation of material

Empirical content consisted of features published on the websites of the Swedish newspaper *Aftonbladet* and the Japanese newspaper *The Japan Times*. Both newspapers were selected primarily on the fact that they reach out to a large part of the population. Although it would have been preferable to use several media sources from each country, only one from each country was selected for this study due to time limitations. Moreover, it might be argued that selecting a newspaper in Japanese would have been more appropriate. However, *The Japan Times*' target group consist mainly of foreign residents living in Japan, which still makes it suitable for the purpose. Additionally, limitations for the study would not have allowed enough time to translate such a large amount of features from Japanese to English.

*Aftonbladet* is one of the oldest daily newspapers in Sweden and aims at reaching out to and entertaining a broad variety of readers, but also scrutinizing the society and its leaders (Aftonbladet, 2017). It has a social democratic political stance (Nationalencyklopedin, 2017), and the Social Democratic party in Sweden's view on nuclear power is that it should be phased out gradually while caring for energy needs and welfare. They do point out that Sweden is highly dependent on nuclear power and that it will be an important part of the country's power production a long time from now (Socialdemokraterna, 2017). In February 2011 *Aftonbladet* reached out to 2, 593 000 people every day (Aftonbladet, 2011), which is close to one-third of the Swedish population.

*The Japan Times* is the largest English newspaper in Japan: as of April 2014, its website had 8, 300 000 page views and 1, 400 000 unique visitors per month (The Japan Times, 2017a) and started out as an English-Japanese bilingual weekly newspaper (The Japan Times, 2017b). It is now Japan's only independent newspaper in English and describes its mission as 'report domestic and international news accurately, speedily, and amply to readers in Japan and overseas from an impartial standpoint[...]to build a well-informed public opinion for the sake of truth and justice, freedom and democracy, and international cooperation and world peace.' (The Japan Times, 2017c). *The Japan Times* does not seem to have a clear political stance, however, they are affected by press clubs. Press clubs consist of significant news organizations and make coverages of stories at government offices and industries. There has been criticism towards press clubs for not letting foreign and Japanese magazine reporters take part in certain activities. They are also criticized for wanting to keep control over what information is being released. *The Japan Times* is part of 34 press clubs (as of January 2007) (Takahara, 2007, January 30). Worth noting is that both TEPCO and Tokyo Metropolitan Government Office have their own press clubs (Freeman, 2000).

### 3.4. Selection

Searching for 'Fukushima' on the *Aftonbladet* website and limiting the results to March 2011 gave 113 results. A time limit between March 12 and March 18 was chosen to further limit the results, and out of these 42 articles featuring the Fukushima accident were chosen. *The Japan Times*' website did not offer a search function. Instead, the only possibility was to go through all features between the dates March 12 to 18 and single out articles featuring the Fukushima accident. This resulted in 25 articles. Out of the 42 articles on the *Aftonbladet* website, 19 were chosen for the analysis. From *The Japan Times*, 15 articles out of the 25

were chosen for the analysis. For the last selection, all articles were read thoroughly and the ones focusing on the nuclear power plant accident and its consequences were chosen for the final analysis. Articles only mentioning the accident briefly were not selected. Some of the articles in *Aftonbladet* included interviews and stories with Swedish citizens in Japan, and how they were affected by the accident. These were not included in the final selection since they did not particularly touch the subject of risk communication and the accident per se. For *The Japan Times*, some articles had a bigger focus on the earthquake and tsunami, and these as well were not selected for the analysis.

All articles selected from *The Japan Times* were news articles. 3 of the 15 articles did not have named authors but were compilations from Kyodo News, Associated Press (AP), and staff reports. 5 of the articles were written or co-written by Kanako Takahara, which means she took part in one-third of the material. 1 article (Gunnarsson, 2011.03.13) from *Aftonbladet* was a correspondence, the remaining 18 were all news articles. The largest amount of articles were written by Carina Bergfeldt (4) and Anna Alexandersson (3).

**Table 1. Article selection for analysis**

Date	The Japan Times	Aftonbladet
2011.03.12	1. Kyodo News 2. Takahara, K.	1. Källman, Jan 2. Bergfeldt et al.
2011.03.13	3. Johnston, E. 4. Kyodo & AP	3. Bergfeldt, C. & Sundell, C. 4. Gunnarsson, B. 5. Röstlund, L & Alexandersson, A.
2011.03.14	5. Hongo, J. & Nagata, K.	6. Källman, J. & Dawod, N. 7. Röstlund, L.
2011.03.15	6. Takahara, K. 7. Kyodo News & Staff Report	8. Dawod, N. 9. Bergfeldt, C. 10. Bergfeldt et al.
2011.03.16	8. Fukada, T. 9. Takahara, K. & Nagata, K. 10. Kamiya, S. & Otake, T.	11. Alexandersson, A. 12. Levin, D. 13. Alexandersson, A.
2011.03.17	11. Takahara, K. & Nagata, K. 12. Martin, A. 13. Fukada, T.	14. Stenquist et al. 15. Wallin, E. 16. Nordh, C. & Stenquist, V. 17. Tagesson, S.
2011.03.18	14. Ajima, S. 15. Takahara, K. & Martin, A.	18. Östman, K. 19. Thorsson et al.

Table 1 shows the distribution of the articles chosen for analysis. All articles were retrieved between 2017.04.12 and 2017.04.18.

### 3.5. Ethical considerations

Since the empirical material did not contain any sensitive information, and consisted of articles published in newspapers, there was no need for ethical considerations regarding individuals. However, it is relevant to consider how the study itself might affect victims from the disaster, even if it does not touch a sensitive subject per se it might still stir up feelings. Another aspect regarding ethical concerns, is how the articles were used. In this study, articles were interpreted through a discourse analysis, and during this interpretation there could be a slight risk of misrepresentations of what the journalists were aiming to

communicate. Furthermore, the articles were also validated to make sure they did not include any disturbing or in other ways inappropriate content. According to Strauss (2015) it is very important for analysts to remember that analytic strategies should be used with flexibility, understanding, and purpose. He furthermore stresses that it might be more beneficial to acknowledge potential biases and use experience in a conscious way to be more open minded about the data. All of this was taken into account when performing the analysis to make the results trustworthy.

### 3.6. Data analysis

To create a frame for the study, *construction of risk perception* was set as the order of discourse, and within this, *risk communication* and *feelings* were identified as discourses. Within these discourses, themes that contribute to the construction of risk perception were identified in the texts. After identifying the themes, the most prominent findings contributing to the construction of risk were sorted out to show the aspects most likely to affect people's risk perception. To find out what kind of reality the texts created in the context of communication and perception of risks, sentences that were particularly descriptive were singled out. The order of discourse was constantly present when these sentences were singled out to make sure they were representable for their purpose. After sorting the sentences, the two discourses were identified and they in turn are represented by the themes. It is within the themes that represent the discourses that the analysis of the detailed parts of the texts took place. The order of discourse, discourses, themes, and the final findings are all tied together and they are what create the reality that the analysis aimed to portray.

## 4. RESULTS

**Table 2. Analysis findings**

Order of discourse	Discourse	Theme	The Japan Times	Aftonbladet
		Experts	- Mostly domestic except for one international	- Mostly domestic - More variety than The Japan Times
	<b>Risk communication</b>	Evacuation	- Confusion - Changing information regarding radius of evacuation zone - Clear risk communication messages	- Confusion - Recommendations from several different countries - Dramatic
<b>Construction of risk perception</b>		Radiation exposure and precautionary actions	- Instructive - Non-frightening - Authorities and professors - Maintain control over own safety - Government trust necessary	- Less information than The Japan Times - Chose different citations
		Previous nuclear power plant accidents	- Separating Fukushima from Chernobyl - No implications of similarities to Chernobyl - INES scale (not a level 7)	- Stressing similarities - Compares Harrisburg and Chernobyl but lacking explanation - INES scale (should be level 7)
	<b>Feelings</b>	Safety	- Early reassuring statement - Experts and governmental spokespersons - Bad news followed by reassurances of safety - Sugarcoating risks - Unclear motives	- Strålsäkerhetsmyndigheten - Handle in non-frightening manner because of previous nuclear events - Trust Japanese authorities - Sweden is safe
		Fear	- Lack of explanations - Reader's own imagination - Words associated to scary events or causing fear - Readers questioning their own safety	- Lack of explanations - Vivid and dramatic messages - Descriptive words associated causing fear, contribute to creating scary images - Readers questioning who to trust
		Confusion	- Technical jargon (lack of explanations) - Contradicting and changing information - Puts the reader in a vulnerable position - Exaggerated or attenuated risk image among readers	- Technical jargon (lack of explanations) - Contradicting and changing information - Media in powerful position - Misleading information - Irresponsible reporting

Table 2 shows the chain of the analysis: starting with the order of discourse, discourses, themes, and finally the most prominent findings for each newspaper.

## 4.1. Risk communication

### 4.1.1. Experts

Both *The Japan Times* and *Aftonbladet* often referred to officials or experts in their articles. In *The Japan Times*, statements by Chief Cabinet Secretary Yukio Edano occurred in 8 out of the 15 articles, making him the most cited official. Prime Minister Naoto Kan was cited in 4 articles and TEPCO in 3. Most of the statements and expert information were provided by Japanese officials and experts, such as scientists and engineers. The only noted foreign sources were International Atomic Energy Agency (IAEA) and Gregory Jaczko, chairman of the U.S. Nuclear Regulatory Commission.

While *The Japan Times* mostly referred to sources from within Japan, *Aftonbladet* used sources from several different countries and instances. Statements by representatives from Strålsäkerhetsmyndigheten occurred in 15 of the 19 articles selected for analysis. Prime Minister Naoto Kan was cited in 6 articles and Chief Cabinet Secretary Yukio Edano was cited in 4. Altogether, 10 of the sources were Japanese, 20 were Swedish, and 13 sources were neither Japanese or Swedish. Information from news agencies was used by both *The Japan Times* and *Aftonbladet*, including Reuters, Associated Press (AP) and Agence France-Presse (AFP), as well as the Japanese news agency Kyodo and Swedish TT.

### 4.1.2. Evacuation

Messages regarding risks published in *The Japan Times* were, in most cases, presented in a matter-of-fact tone, often with additional remarks urging people to stay calm. One of the earliest messages, published on March 12, included the following:

”The evacuation advisory was issued for people living within a 3-km radius of the plant, while those living within a 10-km radius were requested to stay home, Chief Cabinet Secretary Yukio Edano said, adding the measure was precautionary.” (Kyodo News, 2011, March 12).

At this stage, Yukio Edano’s statement made it appear as if there was no immediate danger, and by adding that ‘the measure was precautionary’, it was obvious that he did not want to cause any unnecessary panic among the people. One day later, on March 13, Johnston (2011, March 13) wrote:

”As of Saturday, the government had ordered residents inside a 10-km radius to evacuate, but the lack of information was creating fear that this was insufficient.” (Johnston, 2011, March 13).

Because this message questioned the previous decision regarding evacuation radius, it might have caused confusion because the readers did not know if they could trust what they were being told. Using wordings such as ‘lack of information’ and ‘creating fear’ could have had effect on how the message was perceived by the public. Later on, the evacuation zone was expanded to 20 km. For both people living in the evacuated area and people in other places, receiving different information could be confusing. The evacuation zone kept growing, which could have led people to worry since they could not trust that they were far away enough from the plant to be safe. Furthermore, the fact that people were told to stay inside implied that it was dangerous to be outside. On the 17th of March, *The Japan Times* cited the government, saying that:

”Despite a series of events that further raised fear of radiation leakage, the government said it doesn’t intend to expand the evacuation zone.” (Takahara & Nagata, 2011, March 17).

By starting the sentence with ‘despite’, the authors indicated that the decision to not expand the evacuation zone might not have been correct. Saying that there was ‘fear of radiation leakage’ could also have had impact on how readers perceived the message. Referring to ‘a series of events’ is very vague and should probably have been explained further to make sure the readers understood what these events were and why there was a ‘raised fear of radiation leakage’.

The official evacuation zone was within a radius of 20 km. However, on March 18, *The Japan Times* wrote that the U.S. Embassy advised their citizens to evacuate if they were living within an 80 km radius of the power plant (Takahara & Martin, 2011, March 18). Other than this statement, there was no other mention of how other countries told their citizens to act. From one perspective, it makes sense to only publish Japanese risk communication messages, as it might have confused residents if they learned that other countries advised their citizens differently. But it could also have been valuable knowledge, and given citizens in affected areas the chance to question whether their wellbeing was actually being put first.

When it comes to evacuation, the messages in *Aftonbladet* were a little different from *The Japan Times*, which only makes sense since *Aftonbladet* is mostly read by people in Sweden. While *The Japan Times* did not include much information regarding directions from other countries, *Aftonbladet* published the following:

”France is advising its citizens to leave the Tokyo-area. The U.S. is warning about travels to Japan. The Swedish Ministry of Foreign Affairs’ dissuasion is valid since two hours — but it only concerns severely affected areas north of Tokyo.” (Röstlund & Alexandersson, 2011, March 13).

This kind of information could be very confusing to the reader, as all three countries provided different advice. For example, Swedish people living in Japan had to choose which information they ought to listen to, which could become a reason for stress and worry. A few days later, Dawod (2011, March 15) cited Naoto Kan saying that: ‘Radiation has spread from the reactors. Everyone must leave the evacuation area now.’ and Dawod continued saying that the Swedish Ministry of Foreign Affairs together with Strålsäkerhetsmyndigheten decided to dissuade from travels to Japan completely. The statement by Naoto Kan was dramatic, and the decision to dissuade from travels to Japan by Swedish authorities indicated that the situation was getting worse.

Swedish people living in Japan were advised by Helene Jönsson at Strålsäkerhetsmyndigheten to listen to Japanese authorities (Bergfeldt, 2011, March 15). Despite this advice, it might still have been difficult to do so because contradictory information showed up in other articles published by *Aftonbladet*.

#### 4.2.3. Radiation exposure and precautionary actions

When it comes to precautionary actions regarding radiation exposure, *The Japan Times* cited the Nuclear and Industrial Safety Agency:

"[...]evacuees can reduce the risk of radiation exposure by wearing long-sleeve shirts and masks, staying out of the rain[...]and taking iodine if necessary. Those staying near the site should shut all vents where they are sheltering, close the windows and keep food and water covered." (Hongo & Nagata, 2011, March 14).

This was repeated and partly elaborated later by Masaharu Hoshi, a professor at Hiroshima University's Research Institute for Radiation Biology and Medicine, who gave further directions on how to protect yourself from radioactive material (Kamiya & Otake, 2011, March 16). While this message was presented in a very clear and instructive manner, there is always a certain tension whenever radiation is mentioned, regardless of the context. However, *The Japan Times* does not use any words or phrases to further cause fear.

Further advice regarding precautionary actions included putting clothes and shoes in a plastic bag or wiping them with a wet cloth or tissue and avoiding getting rained on. People living in Tokyo were advised to shower when they came home. These risk communication messages were presented without any use of words that might frighten the reader. Saying that 'NIRS advises[...]' (Kamiya & Otake, 2011, March 16), gave the reader a reassurance that the information was coming from a safe source, given that they understood what NIRS is. In addition to this, Masaharu Hoshi, professor at Hiroshima University, was also repeatedly cited. Citing authorities and professors when communicating risks will make it more reassuring and contributes to the reader perceiving the situation as less scary, and thus, constructing a reality where he or she still will be able to maintain control of their own safety.

Several messages in an article by Fukada (2011, March 17) indicated that there was no immediate risk to Tokyo regarding radiation. One example from the article says that the government 'had no plans to prepare any radiological countermeasures', which could be interpreted as: if the government feels no need to prepare any countermeasures, there is no need for the public to worry too much about it either. In a top-down society, the public is somewhat bound to listen to higher authorities, and in this case the government is presented as being very firm in their statement. However, looking at it from a perspective where the public do not trust the government, these kind of messages could have the opposite effect. If there is no trust from the public towards the government, the public might perceive the government as negligent and not caring enough about the people's wellbeing. Thus, there are two possible outcomes: either the public will trust the government's judgement and stay calm or they will feel ignored and it will have the opposite effect.

In *Aftonbladet*, there was not much information regarding precautionary actions related to radiation exposure, which is only understandable since Sweden was on a safe distance from the reactor itself. There was, however, some mentioning of what Japanese authorities were advising citizens in affected areas to do. They cited *Sky News* saying that 'Authorities are urging people in the area to stay inside and not drink tap water. If you have to go outside, do not expose any skin[...]' (Bergfeldt et al, 2011, March 12), which goes in line with what was communicated by *The Japan Times*. *Aftonbladet* also cited Chief Cabinet Secretary Yukio Edano: 'There is no doubt that the levels now are high enough to affect human lives. Stay calm. Leave the nuclear power plants. The further away you are the smaller the risk of radiation[...]do not go outside. Close your windows. Do not use ventilation. Hang your laundry inside.' (Dawod, 2011, March 15). The beginning of the message sounds a little dramatic, but the rest of it presents very clear directions on how to act.

While *The Japan Times* mostly referred to experts and professors when communicating precautionary actions for radiation exposure, *Aftonbladet* referred to a news channel and the Chief Cabinet Secretary. One interesting point is what the two newspapers chose to cite, *Aftonbladet* seems to have chosen more dramatic citations, while *The Japan Times* was more instructive.

## 4.2. Feelings

### 4.2.1. Previous nuclear power plant accidents

Saying that experts 'were quick to stress there are no signs of a critical meltdown, let alone a catastrophe comparable to the 1986 Chernobyl disaster' (Hongo & Nagata, 2011, March 14) could be a way to, in an early state, make a clear distinction between the current situation and the Chernobyl disaster. Hongo and Nagata (2011, March 14) further wrote that 'other pundits dismissed the notion of comparing the Fukushima crisis to Chernobyl, noting that the two plants differ in basic construction[...]'. It was thereby further established that the two cases should not be compared, although these 'other pundits' were not clearly defined. All articles mentioning Chernobyl, did it only to emphasize that the two cases are different. Not one of *The Japan Times*' articles mentioned Chernobyl in a way that implied the two disasters are similar to each other.

On March 16, when the situation at Fukushima had gotten worse, *The Japan Times* still continued to stress that it would not end up like Chernobyl. Takahara and Nagata (2011, March 16) cited Kazuhiko Maekawa, professor emeritus at the University of Tokyo, saying that '[...]although a meltdown is possible[...]such a case would be different from the 1986 Chernobyl core meltdown in Ukraine that involved a large-scale nuclear explosion.' *The Japan Times* made it clear that this was definitely different from Chernobyl; even though there was the fear of a meltdown, it would not have been as bad as Chernobyl. This could have contributed to the reader's construction of that risk. If it would only have said 'a meltdown is possible', it would likely have been more probable to cause fear and possible amplification of that risk. However, the adding of 'such a case would be different from[...]Chernobyl' made the former sound not as frightening.

Overall, in the articles mentioning Chernobyl there was a strong emphasis on the fact that the two reactors were constructed differently and that what happened in Chernobyl could not happen in Fukushima. Not once were any similarities mentioned between the two scenarios, which means it was not being used to arouse any feelings among the readers.

The articles in *Aftonbladet* mentioned Chernobyl continuously and to a much larger extent than *The Japan Times*. One of the earliest articles cited nuclear scientist Paddy Regan saying that '[...]a new Chernobyl disaster is very unlikely[...]'. (Bergfeldt et al, 2011, March 12). However, on the same day, Källman (2011, March 12) cited a Swedish citizen living in Japan saying 'Just remember the accident in Chernobyl 1986 and how it affected Sweden even though it was 1 000 km away[...]'. Publishing such a statement from someone who was not well-informed regarding the risks connected to the situation at Fukushima, might be considered somewhat thoughtless. Even if the readers understood that these were the personal thoughts of someone who was not an expert, it might still have caused unnecessary fear and

worry because it woke the thought of a very serious nuclear power plant disaster. Further mention of the Chernobyl disaster included the following association between the situation at Fukushima, and Harrisburg, and Chernobyl:

”The images of the explosion in Fukushima 1 will become classical. Japan got its Harrisburg, its Chernobyl.” (Gunnarsson, 2011, March 13).

It did not, however, explain the similarities or differences, which could have caused the reader to create their own image of the disaster. Depending on how much previous knowledge the reader had about Harrisburg and Chernobyl, it could have led to a perception of the risks being much more severe than they actually were. *Aftonbladet* also cited Frigyes Reisch, ’[...]one of Sweden’s leading experts in nuclear safety’, saying that ’Fukushima is as serious as Chernobyl’ (Röstlund, 2011, March 14). Saying that Fukushima is as bad as Chernobyl was a somewhat bold statement to make when people were already worried about the situation and when there was still unclarity and insufficient information. Thinking about what position *Aftonbladet* had in the context of influence over the people, it could be considered rather ignorant to publish such a statement, especially from only one person. Frigyes Reisch was further cited by Östman (2011, March 18) saying:

”[...]the Chernobyl accident 1986 was classified 7 of 7. But if the cooling of Fukushima fails, radioactive waste might be a lot bigger[...]This is more than a seven.” (Östman, 2011, March 18).

Here, Frigyes Reisch was talking about the INES scale, and he said that the Fukushima accident was more than a seven. Adding to further confusion is the fact that he first said that *if* the cooling does not succeed, it could get worse than Chernobyl. Directly after he said that it already was more than a seven, which implies that it already was worse than Chernobyl. At one point he was actually cited saying ’This is worse than Chernobyl’ (Östman, 2011, March 18), and *Aftonbladet* chose to publish these statements. By doing so, it appears as if they did not particularly care about how this information would be received by the readers.

However, on March 16 the following was published:

”If the spill get as bad as in Chernobyl, will it affect Sweden?  
— Not at all. It will be so diluted that it does not have any practical consequences.” (Alexandersson, 2011b, March 16).

The above was a question asked to Per Bystedt at Strålsäkerhetsmyndigheten, and one of few statements not saying that the situation at Fukushima would turn out as bad as Chernobyl. Whether or not it was true could of course be discussed, but the point is that it might have been valuable to give the reader an opportunity to weigh competing information against each other. It is quite clear what was important to the reporter in this question: one, if it was comparable with Chernobyl; and two, whether it would affect Sweden or not. The answer, however, was very firm and clearly stated that there was no danger to Sweden, even if it became as bad as Chernobyl.

There was a very big difference in how frequently the two newspapers mentioned previous nuclear disasters and, foremost, *how* they mentioned them. *The Japan Times* repeatedly stressed that there was a big difference between what happened in Fukushima and Chernobyl,

whereas *Aftonbladet* rather continued making comparisons, trying to find similarities. Chernobyl was also used by both newspapers when mentioning the INES scale, but again, *The Japan Times* continued to stress that this disaster was not a level 7 and *Aftonbladet* on the other hand referred to experts saying that this should be a level 7.

#### 4.2.2. Don't worry, everything is fine

Hongo and Nagata (2011, March 14) cited Hiromi Ogawa, a former engineer at Toshiba Corp.: saying 'I think the worst scenario has been avoided'. This was a very bold statement to publish, since there was still confusion and lack of information regarding the situation. The fact that Ogawa said 'I think' gave some room for a changed scenario, but it was still slightly unclear why a statement like this would be published in such an early state. Hiromi Ogawa would probably be considered an expert, and therefore taken more seriously than a person who did not have the same knowledge.

In *The Japan Times*' articles, assurances from a variety of experts and governmental spokespersons occurred frequently. Several times they would present 'bad news' or some kind of risk, but then follow up with assurances that it was not dangerous.

"Pundits say that although exposure to radioactivity may sound serious, a radiation level of 1,015 microsieverts per hour — the highest level detected inside the power plant since the earthquake — isn't as grave as it sounds." (Hongo & Nagata, 2011, March 14).

The above statement could be interpreted as an attempt to attenuate the risks and dangers connected to radiation. 'Pundits say that *although*[...]' and '[...]isn't as grave as it sounds' imply that the authors (or someone else) did not want people to panic about the high radiation levels. Two days later, Fukada (2011, March 16) referred to the Tokyo Metropolitan Government saying that 'Radiation reached around 20 times normal levels in the capital[...]while offering the assurance this reading pose no immediate risk to human health and that the public should remain calm'. Whether the decision to 'sugarcoat' the risks in this manner was a decision made by *The Japan Times*, the authors, or some higher authority is not possible to tell. There is, of course, also a possibility that there were no such thoughts behind the text and it was merely an honest description of reality. Either way, it could have effect on how readers perceive the risks of radiation.

Martin (2011, March 17) referred to 'experts' in one article, not defining who these experts were. But if there was no mentioning of them, the information would likely lose some of its credibility. This text is somewhat complex, because it first expressed that there was 'an acute emergency' but directly after stated that 'the Fukushima No. 1 nuclear plant was designed to handle serious accidents'. Only mentioning the acute emergency and not pointing out the fact that the nuclear plant was designed to handle serious accidents would have given the reader a completely different picture of the situation. Therefore, the inclusion of that information could have contributed to readers constructing a less frightening image of the risks, and given them a feeling of safety.

In *Aftonbladet*, a majority of the sources mediating a feeling of safety came from Strålsäkerhetsmyndigheten. For example, Lars Gunsell at Strålsäkerhetsmyndigheten was cited saying that '[...]a meltdown would likely not cause any severe danger to the

surroundings.’ (Bergfeldt, 2011, March 12). He was further cited by Bergfeldt & Sundell (2011, March 13) regarding a meltdown; ‘The most important thing to remember is that they are taking great actions to prevent consequences on the surroundings from a meltdown[...]’. Looking at these two messages, a meltdown clearly seemed to be among the things that caused a lot of worry. Because of previous events, such as Chernobyl, the word ‘meltdown’ likely had an impact on people and thus the need to handle it in a non-frightening manner.

”Yes, there is a leak of radioactive material. No, it is not good at all. But it will not reach Sweden.” (Bergfeldt, 2011, March 15).

The above is a statement by Helene Jönsson at Strålsäkerhetsmyndigheten and it sent a very clear message: people in Sweden did not have to worry. Starting the first sentence with ‘yes’ and the second one with ‘no’ gives the impression of a firm statement and that there was no discussion whether this was true or not. The last sentence was also a clear statement that left no room for discussion: no radioactive material would reach Sweden.

Helene Jönsson was also cited saying ‘We need to trust the information we are handed. The information coming from Japanese authorities is true.’ and ‘[...]it will not come here. There is no need to worry.’ (Bergfeldt, 2011, March 15). These messages were all part of an interview and thus, published at the same time which enhances the impact. Saying that ‘we need to trust the information we are handed’ implied that there might have been opinions regarding whether the information coming from Japanese authorities could be trusted or not. Considering the circumstances with information coming from a variety of sources in different countries, this was a clear message saying that the information we should trust is the one coming from Japanese authorities. The bottom line of the interview with Helene Jönsson seems to have been that people in Sweden should not worry about radioactive material and that information coming from Japanese authorities should be trusted. Since Helene Jönsson was representing a Swedish authority, it is possible that what she said had a greater impact on Swedish people than information that came from other countries or individuals even if they had ‘expert knowledge’.

”We need to trust that they are doing what is best. In this acute state, we cannot criticize not getting the information we want from our desk- and analysis perspective.” (Alexandersson, 2011b, March 16).

Cited above is Per Bystedt at Strålsäkerhetsmyndigheten and what he said goes in line with what was said by Helene Jönsson. It is obvious that the Authority was striving to give a unified impression by giving the same statements. However, they were in a position where they had a lot of knowledge on the matter, which was not the case for a majority of the people reading the newspapers. The people were experiencing a scary situation, but they did not have the knowledge themselves to make any judgements regarding the severity of the risks. This puts an authority such as Strålsäkerhetsmyndigheten in a very powerful position because the people did not have much of a choice but to trust that what they were being told was true. In this case, *Aftonbladet* shared that power in the sense that they were distributing the information from the Authority and they had the ability to make choices regarding how this information was presented.

### 4.2.3. Fear

The sentence 'Four hurt; radiation spews amid frantic effort to prevent meltdown' (Kyodo News & AP, 2011, March 13) includes several words that could cause the reader to feel fear. It says that four people have been hurt and that 'radiation spews amid frantic effort to prevent meltdown'. Saying that 'radiation spews' could have given the reader the impression radiation was coming out uncontrolled and the mere use of the word 'meltdown' without further explanation could possibly cause worry and fear. In addition, this sentence also includes the word 'frantic' implying that because of the emergency, it was necessary to work very quickly to prevent a meltdown.

"Fears of the worst-case scenario — a total core meltdown — are increasing because the No. 2 reactor's self-cooling system failed and sea water was being pumped in from outside." (Takahara, 2011, March 15).

Talking about 'the worst-case scenario' could have both a calming and a worrying effect on the people's perception and construction of risk. If the worst-case scenario is not that scary, it could be calming. Although, in the above sentence *fears are increasing* insinuate that it was something that should be considered dangerous. Additionally, the worst-case scenario was 'a total core meltdown', but there was no definition of what consequences this meltdown would have had in regards of for example exposure to radiation. This left the reader to his or her own imagination, which could cause either fear or ease, depending on previous experiences, knowledge, and where they live.

In the sentence 'Edano's remark, though retracted later, raised further fears over whether the vessel can hold as workers pump in water in a frantic bid to cool the reactor' (Martin, 2011, March 17), 'further fears' and 'frantic bid' give the impression of a very serious situation. 'Further' implies that there already was fear and now it has gotten worse, and 'frantic' lets us know that there was not much time and the work had to be done soon to avoid greater risks. Another sentence by Martin (2011, March 17); 'Panic spread as reports on the crippled Fukushima nuclear plant indicated Wednesday high levels of radiation have leaked at the compound', includes the words 'panic' and 'high levels of radiation', which also tells about the seriousness of the situation. 'Panic' is a strong word since it implies that there was reason to enter such a state. When it comes to 'high levels of radiation', the mentioning of radiation and high levels during a nuclear emergency could be likely to cause people to feel scared, especially since the word 'panic' was used in the same sentence.

Messages contributing to fear were a lot more vivid and dramatic in *Aftonbladet* than in *The Japan Times*. One of the earliest articles (Källman, 2011, March 12) included words such as 'nightmare' and 'scared to death', which are very descriptive and directly give the reader an image of a scary and serious situation. When the reader is trying to picture what is happening, such words might contribute to creating an even worse picture than if they had not been included or if more gentle words had been used. Moreover, phrasing the distance between Fukushima and Tokyo as *only* 240 kilometers created an image of the distance being smaller than if the word 'only' had been left out. "Frigyes Reisch knows what he is talking about[...]the release of radiation most likely contains lethal doses. The fact that Japanese authorities classify the situation as a four on the seven-graded INES-scale, he dismisses as expurgating." (Röstlund, 2011, March 14).

Stating that Frigyes Reisch 'knows what he is talking about' insinuates that he was a person that could be trusted and that the reader should believe what he was saying. Giving the readers this kind of information could contribute to them creating an image of the risks as very severe and dangerous. There is, however, another side to it: it also gave the readers an opportunity to question the information they were given by authorities (Frigyes Reisch was a retired associate professor in nuclear power safety and not tied to any kind of institution). Yet, the way the above message is phrased could be considered unnecessarily frightening. Saying that the Japanese authorities were wrong and that they were censoring the situation might have caused readers to not trust any information and make up their own versions of what was happening. Too much information and theories from independent sources that do not have the same access to direct information could potentially lead to even greater confusion.

'The European Commissioner for Energy, Günther Oettinger was talking about an apocalypse yesterday.' (Tagesson, 2011, March 17). In a state of chaos, insecurity, and confusion, talking about an apocalypse seems a little too much. 'Apocalypse' is a very strong word and using it in this kind of setting will likely add to the readers perceiving the situation as a lot more scary than if the word had not been used. Especially coming from The European Commissioner for Energy, it could possibly have had an even stronger impact on people's perception of the risks.

"Despite the reassuring reports the fear of radiation grows in Tokyo. In the city Maebashi, 100 kilometers northeast of Tokyo, radiation was ten times higher than normal in the morning and meteorologists are warning about the wind blowing southwest. That could bring radiation from Fukushima 1 to the gigantic city." (Bergfeldt et al, 2011, March 15).

The use of the word 'despite' in the beginning of the sentence strongly implies that the reassuring reports should not be completely trusted. Another point here is that the city Maebashi is not particularly close to Tokyo, which makes one wonder why it is being used as an example in this context. Pointing out that radiation was ten times higher in Maebashi and saying that this could affect Tokyo does not make sense. Of course, if there would have been an explanation saying that because radiation levels were higher in Maebashi, which is located about 300 km away from Fukushima, there was a risk radiation levels could get higher in Tokyo as well. However, there was no such explanation, which means that it is questionable why the reporter chose to include that information. The lack of proper explanations might have caused readers to feel confused about what they should actually feel worried about, which in turn might have led to inaccurate perceptions of the risks.

#### 4.2.4. Confusion

'The nuclear power plant lost cooling ability[...]and radioactive cesium and iodine were detected nearby Sunday.' (Kyodo News & AP, 2011, March 13).

The above sentence does indeed describe what was happening, but to a person who does not know much about the subject it could come off as confusing. Merely saying that the power plant lost cooling ability and that radioactive cesium and iodine were detected nearby is likely to have caused confusion at least to the readers who were not familiar with the terminology. It

might cause the readers to feel worried because they do not understand what the facts actually mean, and what consequences it will have on them. Furthermore, several articles noted different levels of micro sievert and milli sievert at various locations, but they did not always explain what these levels actually meant. Talking about, for example, radiation levels without giving a proper explanation of what sort of consequences they will have to the reader puts the reader in a vulnerable position.

For example, Takahara and Martin (2011, March 18) wrote that 'if the storing pools, which are located outside the containment vessels, dry up, the spent nuclear fuel will melt down, releasing large amounts of radiation'. Without much knowledge about how a nuclear power plant works, this statement did not tell the reader anything except that there was a risk of a large amount of radiation being released.

Another potential source of confusion could be contradicting and changing information. Takahara and Martin (2011, March 18) wrote that the chief of the U.S. Nuclear Regulatory Commission, Gregory Jaczko, said that the pool at the No. 4 reactor was empty. Based on this, American citizens within an 80-km radius were asked to evacuate by the U.S. Embassy. Publishing both this information and information released by Japanese authorities, might have been very confusing to the readers since it did not say the same thing, and they might not know who to believe. They were, again, put in a vulnerable position where they had to choose what to believe in and how to interpret what they were reading. Based on the readers' background knowledge and experiences, this could result in the construction of either an exaggerated or attenuated risk image. Furthermore, U.S. citizens (and likely other countries) living in Japan was in an even more difficult position because they had to decide which authority they should listen to.

Similar to the previous example, contradictory information was published in *Aftonbladet* as well. Questioning statements and information is important, as is being critical and careful about what sources to believe. But with different information coming from various sources and countries, it will be difficult to decide which one to believe. This could also lead to distrust towards authorities; for example, if a person chooses to believe one specific source and it proves to be wrong, that trust will likely be gone. The role of media in all this was very complex because they had a powerful position in the sense that they were the ones who got to choose what to publish. But the question is whether reporters had enough knowledge to make decisions regarding what sources and information to include in their articles. If reporters do not have sufficient knowledge, they might publish information that is wrong, out of context or irrelevant, which is not good from a risk communication point of view because it could lead to confusion among the readers.

"Yesterday Frigyes Reisch told Aftonbladet that 'there is not much time' and that all meltdowns should be drowned within 24 hours." (Östman, 2011, March 18).

Like *The Japan Times*, *Aftonbladet* also published information about radiation levels without explaining what the actual consequences might be. For example, Dawod (2011, March 15) wrote that 'Radiation levels around the nuclear power plant went up a lot — to 8217 micro sievert per hour[...]that is eight times higher than the limit for a whole year'. The article does not contain any explanation about what type of consequences this might cause, exactly where

it was measured, or for how long. The main point is that radiation levels were getting higher. Again, without any previous knowledge, this statement is very difficult to interpret and make sense out of, which could likely cause confusion. Considering the fact that *Aftonbladet* was being viewed by a lot of people, it seems rather irresponsible to not make the effort to explain in a way that makes it possible for any person to understand. It might also have been beneficial to look at the reason why such information was included in the article and whether the reporter fully understood it or not. A common trait that might cause confusion among the readers is the lack of explanations, and the fact that some statements seem to be somewhat out of context or irrelevant.

## 5. DISCUSSION

### 5.1. Results discussion

Because of the unique combination of unlikely events—a nuclear power plant failure caused by an earthquake and a tsunami—the Fukushima accident might be considered a so called 'black swan'. Since humans are limited in their way of acquiring knowledge through observations and experience (Sonnsjö & Mobjörk, 2013), understanding and comprehending the risks connected to the accident became complicated. This was also demonstrated in both *The Japan Times* and *Aftonbladet*, for example, when reporters published information regarding risks, but did not give proper explanations about what the actual consequences might be.

As Friedman (2011) stated, reporters did not have enough technical knowledge when covering the nuclear accidents at Fukushima, Chernobyl, and Three Mile Island, which led to difficulties when reporting about the accidents. The same thing was noted by Tomkiv and colleagues (2016), who found that journalists in Europe and Russia covering the Fukushima accident probably did not have enough knowledge about radiation issues, which led to them being unable to explain or make sure the information they received was correct. This was also true for Japan and Sweden, albeit on slightly different points. Reporters repeatedly used technical terms that a lot of readers might not understand. For example, as the analysis showed, both *The Japan Times* and *Aftonbladet* published different levels of micro sievert and milli sievert without actually explaining what kind of risks might be connected to these levels. Doing so could be a result of journalists lacking knowledge themselves and therefore not knowing how to put the information they receive from experts into a context that is easy to comprehend for the readers. Perhaps if the journalists would have had more knowledge about nuclear science and radiation, they might have been able to better care for the readers' interests and present risks more clearly.

Neumann and Lavino (2010) noted that people tend to perceive risks differently and make incorrect decisions when there not enough information is provided. The fact that both *The Japan Times* and *Aftonbladet* published insufficient information implies that people might have created an image of radiation risks that did not match reality, at least when considering people who did not have any previous knowledge regarding these risks. When it comes to the question of whether the media was being irresponsible when communicating risks, the answer depends on how the situation is viewed. Not providing sufficient facts, using difficult technical terms, and not putting it into a more easily understood context could be considered irresponsible.

However, the media probably did not act to purposely cause confusion and distort people's risk perceptions, which is why it might be argued that they did not intentionally act irresponsibly. Reporters working at an everyday newspaper not having specific knowledge should probably not be considered as something odd, since their job is to cover a variety of subjects. Expecting them to be able to explain something they might not even fully understand themselves is simply not possible. However, being aware of their limitations and adjusting what they publish based on this could be one possible way to improve the quality of information regarding nuclear issues. The question is, who should be responsible for making sure that adequate and understandable information is being communicated through media

during a nuclear emergency? After all, the main purpose of a newspaper is to cover news and sell issues, the question is whether they can even be asked to take responsibility for how risks are communicated and perceived during an emergency.

While *Aftonbladet* included what other countries advised their citizens to do in terms of evacuation, *The Japan Times* only mentioned recommendations from the U.S. Embassy to American citizens. As Lazic and Kaigo (2013) noted, quoting experts with contradicting opinions might be seen as conflicting and affect how people understand and make sense of the news. For Swedish citizens (and probably other countries) living in Japan who followed both Swedish and Japanese media, it was probably difficult to decide which information they should trust. The publishing of evacuation recommendations by different countries might have contributed to people not knowing which one they should listen to, and thereby causing them to perceive the situation as more scary because they did not get consistent information. Of course, it could be considered the duty of a newspaper to publish different points of view and show how other countries are reacting, which is why it is of interest to actually look at the position of media when it comes to risk communication during an emergency. The main purpose of media might be to share news, but since it is also being used as a risk communication channel, maybe it should have more pressure put on it to consider what they publish during such a situation.

In *The Japan Times*, all mentions of Chernobyl clearly stated that the same thing would not happen in Fukushima. On the other hand, *Aftonbladet* not only mentioned Chernobyl more often, but also made associations saying that Fukushima was as bad as Chernobyl. Even if experts from Strålsäkerhetsmyndigheten were, at some points, given space where they expressed that what was happening in Fukushima was not the same as Chernobyl, articles saying the opposite also occurred frequently. In particular, the retired professor Frigyes Reisch was cited several times saying things such as 'this is worse than Chernobyl' (Östman, 2011, March 18). According to Kasperson and colleagues (1988), sensational headlines related to the Chernobyl accident led to the accident becoming more memorable and nuclear power to be perceived as potentially catastrophic. So, already during the Chernobyl accident the media contributed to making nuclear power perceived as something very dangerous and risky. Since it was only 25 years between the accident in Chernobyl and the accident in Fukushima, many people in Sweden probably still remembered the consequences from Chernobyl, and might have felt emotional because of that. This could be one of the reasons why Chernobyl was mentioned in different contexts in *The Japan Times* and *Aftonbladet*.

Dramatization is a great source of risk amplification (Kasperson et al, 1988) and using a scary event from the past could be considered dramatizing the current situation. Making a comparison to previous nuclear accidents might not be a bad thing per se; it could even be a good way to put the the severity of the ongoing emergency into context. Some of the problematic aspects lie in the fact that the Chernobyl accident might have been amplified by the media when it happened, which means that people might have had different perceptions of its severity. Even if the media made an accurate comparison, it might not be usable anyway because there is no uniform image of the Chernobyl accident. When it comes to how the Fukushima accident was compared to the Chernobyl accident, *The Japan Times* and

*Aftonbladet* used it differently. The question is whether *The Japan Times* used it to attenuate the risks related to the Fukushima accident or if *Aftonbladet* used it to amplify them.

Chong and Druckman (2007) describe framing theory as when people create a certain conceptualization or change their way of thinking about a certain issue. An issue may have different implications for several values or considerations, depending on what perspective is being used. For *The Japan Times*, many of the sources that provided reassuring statements were experts and governmental spokespersons. They would present risks, but then follow up saying those risks did not pose any danger to the people. By doing so, *The Japan Times* could be trying to steer not only people's risk perception, but also their opinions regarding nuclear power. The same goes for *Aftonbladet*, where a majority of the sources were different experts at Strålsäkerhetsmyndigheten. By looking at their statements, it becomes obvious that the Authority was reacting to what people were worried about the most. For example, there were assurances saying that even if there was a meltdown, the Authority was taking actions to handle it, and that there was no need to worry about radiation in Sweden. Furthermore, Strålsäkerhetsmyndigheten emphasized that the information coming from Japanese authorities should be trusted. According to Mral and Vigsø (2014), Strålsäkerhetsmyndigheten used the situation to improve their image as an engaged authority: they emphasized their scientific knowledge and their willingness to complete their mission of answering to both the country and the people. The results of this study shows the same, and because of the Authority being the most reoccurring source among the articles in *Aftonbladet*, it definitely had an impact on how the risks were presented. *Aftonbladet* may not have had the intention to frame anything, but it did not have much choice because Strålsäkerhetsmyndigheten was one of their primary sources.

Both *The Japan Times* and *Aftonbladet* extensively used statements from officials and authorities, which were likely to have had their own agenda, and they thereby might have contributed to framing. Their potential motive for this will not be further discussed in this study, but the mere fact that both newspapers probably were steered in certain directions means that this also likely had an impact on how the risks were perceived by the people. It might be interesting to question the position of media in all this and how it was being used by, for example, authorities that wanted to use the situation to push their own agendas. This does not automatically mean that newspapers were being irresponsible, as they probably did not have access to a vast amount of trustworthy sources. However, what they could do is be critical against their sources and question their trustworthiness. Neither *The Japan Times* or *Aftonbladet* openly did that, which means that they were in a way contributing to creating the risk image constructed by these sources.

As the analysis showed, messages contributing to fear were much more vivid and dramatic in *Aftonbladet* than in *The Japan Times*. This could be a sign that media in Japan were controlled by higher authorities and that the political situation was different. On the other hand, it could also be an indication that Swedish media treated the situation more like a news subject and focused on giving their readers a 'good' story, instead of only reporting news in a neutral manner. Park and colleagues (2016) noted that what is presented in the news is not only steered by elites, but is also influenced by journalists and what they determine is important to mediate. Journalists, public opinion, and elites are all a part of the circular

process that influences information. Because of this, it is difficult to confirm what parts of the news are what. We do not know what information the journalists in Japan and Sweden had access to to start with and what they chose to publish or leave out. This is where we return to the problem of journalists' lack of knowledge regarding nuclear science and radiation. They are the ones deciding what to publish—but how are they supposed to know what is relevant or not when they make their choices? Perhaps there is a need for better communication between elites, journalists, and the public in order to be able to provide relevant and easily comprehensible information regarding risks after a nuclear emergency.

Media bias or sensationalism, advocates distorting or being selective with information, and hidden agendas or standpoints that are not rational are among common charges towards the risk communication process (Leiss, 1996). All of these can be found in both Japan and Sweden. *Aftonbladet* can more readily be accused of media bias and sensationalism, where wordings such as 'nightmare', 'scared to death' and 'apocalypse' occurred in addition to repeatedly relating the Fukushima accident to Chernobyl. *The Japan Times* was not fully as dramatic as *Aftonbladet* and in comparison kept their articles more composed, even if some of them included wordings that could be considered unnecessarily powerful. Regarding being selective with information and hidden agendas, it was already established earlier that higher authorities probably had a large influence on what was being published. Lazic and Kaigo (2010) stated that communication chains in Japan are long and bureaucratized and information is centralized. In Sweden, Mral and Vigsø (2014) found that scientists from Strålsäkerhetsmyndigheten were not disputed when they made appearances. With regards to this, there is reason to believe that information might have been distorted on several different instances in both Sweden and Japan.

Risk communication through media can be complex and difficult to perform to everyone's satisfaction. As we have found out, there are several actors involved, all with their own agendas and missions, which make it a messy business. All of these actors are contributing factors to how the people will perceive risks and what the risks will look like within their constructed reality. According to Neumann and Lavino (2010), risks will be perceived as more dangerous when no one seems to be able to control them, they are brought on people involuntarily, and they are new to the people being exposed. These are three factors that were all true for the Fukushima accident, which means that people likely perceived the risks as more dangerous to start with. The media needs to be aware of this and must communicate to the people in a composed manner.

## 5.2. Methods discussion

For a qualitative study to be transparent, the methods being used must be described in a manner that others can understand and evaluate. In addition, all data should be available for reviewing. The main goal is to base conclusions on data that have been gathered and analyzed in an open and honest way. Validity stretches further than the study's observation and should therefore include all facts presented in the study. Consideration should be given to whether another similar study would reach the same conclusions (Yin, 2011). When it comes to discourse analysis, it is not entirely possible to aim for full reliability, validity, and transparency. According to Börjesson and Palmblad (2007), knowledge does not reflect one univocal reality because all knowledge is a social construction. Reality is constructed with the

use of language. Thus, discourse is constructive and, when language is being used, each and every person creates their own reality, which is why reliability and validity are concepts that are difficult to apply to discourse analysis.

One of the problems related to discourse analysis is that there is no clear distinction between the discourse analysis and the analysis of the social practice. There are no guidelines for the extent of the social analysis or what types of sociological or cultural theory can or should be used. It is also unclear in what way the discursive and non-discursive affect and change each other (Winther Jørgensen & Phillips, 2000). Referring to this, it is obvious that there are no clear guidelines in general regarding how to conduct a discourse analysis, and this is likely a point worthy of receiving critique. Of course, this fact might lead to issues concerning reliability and validity. However, it can also be a valuable asset for the study at hand. Since the existing guidelines may be interpreted differently, it also opens up for the possibility to reach new perspectives on various issues.

*The Japan Times* and *Aftonbladet* are two different types of newspapers, *The Japan Times* is mainly read by foreign residents in Japan and *Aftonbladet*'s audience to a large extent consist of Swedish people living in Sweden. This is something that might have had some influence on the news focus, which in turn potentially could have had effect on the results of this study. Furthermore, there is also a slight risk that the fact that *Aftonbladet* originally is a daily newspaper and *The Japan Times* is a weekly one (even if they both publish news daily on their respective websites today) might have had some impact on the results. A daily newspaper is supposed to get news out fast and *Aftonbladet* mentions 'entertaining' their readers as part of their mission (*Aftonbladet*, 2017) which implies that its not only aiming to deliver news. It might be argued that a different newspaper would have been more suitable for the purpose of this study, but the choice fell on *Aftonbladet* because it reaches out to a large part of the Swedish population. However, it should be mentioned that choosing a different newspaper with less focus on entertainment might have led to different results. *The Japan Times* presents news with a slightly different purpose than *Aftonbladet* but the main purpose of both newspapers is still to deliver news. Because all Japanese newspapers are being controlled by press clubs, it is questionable whether an analysis of a different newspaper in Japan would have resulted in different findings.

In 2010, nuclear energy accounted for about 29.21 per cent of the energy in Japan (International Atomic Energy Agency, 2017a), and 38.13 per cent in Sweden (International Atomic Energy Agency, 2017b). Since both countries at the time were highly dependent on nuclear power, it is worth considering whether this might have had an impact on what was published in the newspapers.

The articles published by *Aftonbladet* were analyzed in Swedish, in the results section they were translated to English. Original articles may be found among the sources and this should not have had any affect on the results.

## 6. CONCLUSIONS

The most prominent resemblance between Japan and Sweden was lacking information, which potentially could be a result of lacking knowledge among the journalists. If journalists would have had more knowledge, they might have been able to better care for the readers and present risks more clearly. Not providing sufficient facts, using difficult technical terms and not putting information into a more easily understood context could be considered irresponsible, since it will have effect on how the readers perceive the risks. However, it is questionable whether the media can be held responsible, since their main purpose is to present news and sell issues. But, they are also a risk communication channel and maybe they should have more pressure put on them to consider what they publish during an emergency. There was a clear difference between how *The Japan Times* and *Aftonbladet* presented risks, *Aftonbladet* dramatized the event quite extensively, while *The Japan Times* rather focused on keeping a more composed approach. This, of course, will have affected how people perceived the risks. Both *The Japan Times* and *Aftonbladet* used statements from officials and authorities, which are likely to have their own agenda. This means that they may have contributed to framing, whether they intended to or not.

For further research on media's role during a nuclear disaster it could be of interest to conduct studies on how well educated journalists are within the subject. Furthermore, to look at solutions for how experts and journalists can work closer together to make sure risks are communicated accurately, to increase the chances of the public perceiving them correctly. Finally, looking more closely at the political stance aspect and effects from the press club system in Japan could be highly relevant for deeper understanding of the newspapers' choices when publishing news.

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