Making an emergency dike

Flood risk perception of inhabitants of Arcen after the flood events in July 2021

Picture I: Flood of Arcen July 2021 (https://nos.nl/collectie/13869/video/2389702-dronebeelden-tonen-wateroverlast-in-arcen)

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Summary

After a few attempts to think of a new topic for my bachelor thesis, my sister and I had a brainstorm session. We both like to think about climate change and what are interesting aspects of it and then especially when it comes to how people react to it. My parents live in Arcen, where I was born and raised. So, when the floods in July 2021 happened it shocked a lot of people that I knew including my parents. Together with my roommate, I went home to put all the furniture up with my mom and I watched my dad 'save Arcen' with his will to increase the dikes around the village. This whole event led me and my sister to discuss it when we came to an interesting aspect of it all. Are there people in Arcen that lived through this event and now think differently about climate change, we asked ourselves. This is how I came to this topic and particularly this case study. I could have chosen a different village or city that lived through these events, but it wouldn't be the same as researching the village where I was born and raised.

To understand the necessary theory about the subject the concepts of climate change, floods and flood risk management are mapped out in the introduction. And after the problem statement, the main research question was more explained and accompanied by sub-questions.

The main research question of this thesis is phrased as follows: *Has the flooding event in July 2021 in Arcen changed the perception of people of* climate change? If yes, how?. To answer this research question, a quantitative research method was adopted. The following sub-research questions have been identified: Which factors affect the perception of flood risk of the inhabitants of Arcen?, Has the event that occurred in July 2021 enhanced the awareness of climate change?, Have the inhabitants of Arcen taken measures for flood risk management after the floods in July 2021?, Have the inhabitants of Arcen taken measures against flood risk after the floods in July 2021?, Have they learned from the experience? and What expectations do the inhabitants of Arcen have for future floods and government management?.

The scientific relevance of this research is focused on the following. The flooding events in Arcen in July 2021 help us to deepen the issue of the perception of people of climate change and whether and how it was affected by such an event. When analyzing risk perception two basic approaches came forward: Constructivist and rationalist. An important paradigm within the rationalistic approach is the psychometric paradigm. This paradigm is developed to quantify the individual perception of risk. It assumes that individuals clarify the world in cause-and-effect patterns and with a cognitive pattern it is possible to model a phenomenon. We use the psychometric paradigm for analyzing flood risk perception. Analyzing flood risk perception is a very important aspect when we are talking about flood risk management. What makes this research so different from other research is the direct link between experiencing the risk events instead of hearing about them.

The societal relevance of this research is about for example analyzing the flood risk perception that will give the government more knowledge about what they could or should change in their policy. It is interesting to see how the experience and actions of the

inhabitants of Arcen, like building an emergency dike, influenced whether the perception of flood risk changed or not.

In the theoretical framework concepts of perception, risk perception and flood risk perception are mapped out. This thesis adopts the psychometric paradigm because it will help analyze the results of the research and because it is a leading theory for analyzing risk perception. The psychometric paradigm is about the rate of how unknown and how dreadful a risk is. These two main factors of risk perception are influenced by the features; worry and awareness. The three main features that influence risk perception and each other are worry, awareness and preparedness. These three features are influenced by cognitive factors like experiences, feelings and actions. But also influenced by situational factors like effects, intensity and the location from the dike where respondents live. The conceptual model of this research contains all these factors, features and elements to research which factors influenced the change in flood risk perception of the inhabitants of Arcen after the flood in July 2021.

The methodology is all about explaining what was done exactly in this research, why and what sort of research it was. Here also the hypothesis is explained along with the main goal of the thesis and the aim. The questionnaire is also described here in detail. The questions and question categories are also explained. The questionnaire survey was performed with the program Qualtrics. To ensure that the survey worked well ten respondents who do not live in Arcen filled in the survey. This helped make sure the survey had questions that were all understandable and that the survey worked perfectly.

To process the data the program SPSS was used. The data process and analysis are also explained here. So, what kind of tests had to be done to get the correct data to answer my research question, and which coherence measure was going to be needed for the different types of variables. And what the values of those coherence measures would mean. There is a table that shows more light on what kind of results were needed and what kind of variables should be tested with each other.

Also, in the methodology described are the case study and an estimated time plan. The case study description gives a more detailed view of what happened during the flooding event in Arcen in July 2021. The time plan was not followed but with the delay in the development of the questionnaire survey and the acceleration of the data process and analysis, the time plan was again followed in week twenty-three.

At the end of the methodology is the actual data process explained further. Why and how each test was run specifically.

While processing the data and running the tests in SPSS, the output was immediately also analyzed. The results are all written down in the data analysis and explained and narrowed down. Here also the psychometric paradigm was adopted. After completing all the tests and analyses of the results, everything is discussed in the discussion and concluded in the conclusion. Here the main research question and the sub-questions got answered.

A lot of what was expected to be in the results if we look at the hypothesis is true to the situation around the flooding event in Arcen in July 2021 and its inhabitants. At least half of the inhabitant's perception of flood risk changed.

The flood risk perception was influenced by worry and awareness. Those two features influenced the rate of how unknown and the rate of how dreadful a risk is. Worry, awareness and preparedness influenced each other. Those three features were influenced by cognitive elements like experiences and feelings and by the situational element intensity. These are the factors that changed the perception of the flood risk.

The awareness of climate change of the inhabitants of Arcen was enhanced and the majority felt that they learned from the experience. But this is discussable because they did not take any measures against future floods or changed their perception of flood risk. So, the question still remains whether they really learned from the experience. They also expect more floods in the future and that the government will do something about it in their policy.

I Introduction

I.I Climate change

Climate change has been a much-discussed concept for quite some time now and as scientific research rises, the concept is being seen as a reality (Adger, 1999). The Intergovernmental Panel on Climate Change (IPCC) explains the concept as a phenomenon that includes all changes in the climate over time. Human activities can trigger changes to the Earth's climate both directly and indirectly. Direct changes like deforestation in the Amazon, influence biodiversity. Indirect changes might be prompted, for example, industrial activities thus affecting the compound of the atmosphere worldwide. Changes in the atmosphere happen because of the increase of greenhouse gasses and aerosols. The solar radiation changes and therefore causes a lot of changes in the characteristics of the land surface. These changes disrupted our climate system (IPCC, 2007).

Climate change is an urgent issue because it can trigger an increase in the number of catastrophic events. One of the main effects of climate change is the increase in global temperature. This effect will cause the sea level to rise and extreme weather conditions (IPCC, 2021). Events like extreme heat waves, storms, floods, droughts and so on are expected to become more frequent and damages and casualties to increase in the years to come. These events will leave damage but also make it harder to live on earth for humans (Schellnhuber, Cramer, Nakicenovic, Wigley, Yohe, Blair & Pachauri, 2006). The world is thus called to adapt and try to limit climate change (Adger, 1999).

Floods

Floods are one of the consequences of climate change; these are expected to become more frequent as climate changes. Floods can be caused by sea-level rise, extreme rainfall and extreme wind (Few, 2003). But also because of snow that is melting, dikes that break or water drainage systems that are poor (Handmer, Penning-Rowsell & Tapsell, 1999). Heavy rainfall is the most common cause of floods (Smith, 1996). The speed of flooding is influenced by factors like vegetation, soil, topography, land use and urbanization. Urbanization has a big impact on how water can stream and at what rate it can be incorporated into the ground (Parker, 1999).

There are a lot of different types of floods. For example, fluvial floods are caused by heavy rainfall whereas rivers flood, also known as river floods. Next, there are pluvial floods, also known as flash and surface floods. These are also caused by heavy rainfall where the ground or drainage system fails to absorb the water or for example when a dam breaks, what is called a flash flood. Next, there are groundwater floods. This type occurs in combination with fluvial flooding. When the groundwater level near a river rises, this also happens further from the river but then more slowly. The groundwater level also drops more slowly here which can cause long periods of floods especially basements (Pommeranz & Steininger, 2019). Last,

we have coastal floods. These are due to storms or tsunamis near the beach. (Nadal, Zapata, Pagan, Lopez & Agudelo, 2010).

There are different types of effects of floods. First, there are environmental effects. Small flooding events can be beneficial for fertilizing fields of agriculture, washing away salts and toxins and refilling water reservoirs (Few, 2003). These can also be disadvantageous. Floods threaten human settlements by damaging houses and infrastructure, livestock and agricultural production by determining the loss of crops and affecting seasonal harvesting and the risk of mudslides (Smith, 1996; Parker, 1999). Next, there are social effects, because making the separation between two sorts of floods, namely beneficial and disadvantageous, is crucial when it comes to developing an attitude towards a certain flood and preventing it from happening with interventions (Few, 2003). Another effect is the increase in health risks (Handmer et al., 1999). This is mainly caused by the risk of flowing water and people that then drown or get killed by moving objects (Few, 2003). But the increase is also caused by outbreaks of diseases (Sanderson, 2000) or infections (Zoleta-Nantes, 2000), unsafe water supplies, bad access to medicine or food, snakebites or insects that increase (Few, 2003). In developing countries, people are mostly affected by the increase in health risks. In Europe, the increase in health risk is way less (Brown & Murray, 2013). For now, only the extreme floods have had a big effect on health risks, but most floods in Europe mainly increase soil degradation. The vegetation and the infiltration capacity decrease which makes heavy rainfall more dangerous because then the direct runoff of water is worse. This means that the floods will become worse (Bronstert, 2003). In the Netherlands, we also see that floods increase pollution in the ground and expose ancient, polluted sediment layers (Zwolsman, Kouer & Hendriks, 2000).

Unfortunately, over the years we can see an increase in the negative effects of floods which are devastating to behold (Smith, 1996). In Germany in July 2021 for example, an extreme flood occurred. A whole area of a town with houses was washed away and a lot of people died because of a mudslide (NOS, 2021c).

Flood risk management

Floods are increasing all over the world and represent a global threat. Spatial planners and water management are called to enhance flood risk management in the years to come (Adelekan & Asiyanbi, 2015).

Flood risk management can take place before, during and after the flood events. The measures to manage floods can be structural and nonstructural (Smith, 1996; Parker, 1999). Structural measures are for example changing river channels, dikes and reservoirs to attempt to control the flooding (Few, 2003). Non-structural measures are more focused on reducing the short- and long-term influence of floods. For example, improving warning devices, evacuation manuals and buildings to prevent water entry (Parker, 1999).

Next to the more general strategies for flood risk management, there is also the role of how local communities and governments respond to floods. The role played by

local communities in coping with flood risk has been increasingly acknowledged. Local communities can actively improve the capacity of urban settlements to adapt to flooding events. This has a lot to do with the knowledge they have about flood risk and flood risk management (Few, 2003). Usually, flood risk management depends on the community the flood is in (Christie & Hanlon, 2001). The role of the local communities is therefore important for creating and contributing to flood risk management. The inhabitants of the environment where the flood occurs, decide what to do with what strategies that were designed and developed by many people over hundreds of years (Blaikie, Cannon, Davis & Wisner, 1994). So, the experience people had with the floods and the knowledge they gained in the past count on the way they deal with it. Experience and knowledge can change the perception of flood risk and therefore flood risk management. In Canada, a study has shown that property owners are not willing to contribute to flood protection. So, to change this there were some flood risk engagement strategies developed to encourage risk-sharing behaviour with property owners, by the government (Thistlethwaite, Henstra, Brown & Scott, 2018). Mainly those strategies were about encouraging necessary measures that would protect their property against floods and increase flood insurance (Thistlethwaite et al., 2018). In Pakistan the importance of the role of local communities became clear when they tied ropes across rivers with bells on them, so when the river is getting too high, the bells would make a sound to warm the inhabitants (Davis & Hall, 1999). In Malaysia, they built houses on raised stilts, or plinths and improved their support network for providing medicine and food (Chan & Parker, 1996). But also, the ideas of growing more bananas and bamboo to build rafts from during floods emerged or growing more catkin (which is a certain type of plant) to give the soil more firmness, or installing community stockrooms of food (Twigg, Myers & Benson, 2000). But also, in Europe, local citizens have been increasingly encouraged to take part in flood risk management (Mees, Alexander, Gralepois, Matczak & Mees, 2018). In Italy, local communities contribute to flood risk management through spontaneous volunteering or organized community groups that focus on response and recovery (Mysiak, Testella, Bonaiuto, Carrus, De Dominicis, Ganucci Cancellieri, Firus & Grifoni, 2013). In Germany local communities take part in flood risk management through participation in land use planning, volunteering during emergencies and organized groups that focus on flood response and are often well-trained (Puzyreva, Henning, Schelwald, Rassman, Borgnino, De Beus, Casartelli & Leon, 2022). In England, they have developed local flood groups, which demonstrate a high level of self-responsibility and decision-making in flood risk management from local communities. These groups work together with the government to manage flood risks (Puzyreva et al., 2022). Usually, in the Netherlands citizens did not take part in flood risk management. But now they do have dike watchers selected from local communities, who are trained to assist the authorities during floods (Puzyreva et al., 2022).

Problem statement

Over the past decades, flood risk management in the Netherlands was mainly about controlling a flood (Puzyreva et al., 2022). Food risk management has been mainly

about the use of structural measures and the development of dikes. Every flood triggered a new discussion on the height of the dikes, followed by investments to make them higher (Van Ruiten & Hartmann, 2016). Increasing awareness and new discussions shone light on the question of whether the resistance strategy of making the dikes higher is good. The resistance strategy has no flexibility, makes landscape quality worse and offers less landscape development than the resilience strategy (Vis, Klijn, De Bruijn & Van Buuren, 2003). The values of nature and culture became more important, and the focus of flood risk management changed more to a resilience strategy than a resistance strategy (Klijn, van Buuren & van Rooij, 2004). How to live with floods and increase the speed of the recovery system after a flood. For example, creating some areas and letting them flood for a certain period (Klijn, van Buuren & van Rooij, 2004). This change in strategy asks for an innovative city plan and cooperation between city planners and water managers and it will require big investments but will have an influence for a long period (Oosterberg, Van Drimmelen & Van der Vlist, 2005).

The shift from structural measures and the focus on resistant measures for flood risks toward resilient solutions calls also for a different role of the local community. The participation of the local community in flood risk management adaptation has been highly advocated. Earlier studies (Samuels, 2009; Mileti, 1980; Lave & Lave, 1991; Whyte 1986; Filatova, Mulde & Van der Veen, 2011) have emphasized the role played by people's perceptions of risks in the way they actively cope with extreme events in general, and flood risk, and on the successful or unsuccessful policy response.

Risk perception is about how people perceive a risk; what people think of a threat and that experience, what they believe in, or what knowledge they have about it (Mileti, 1980). Risk perception is about the subjectivity of a judgment of people on whether a certain threat is likely to occur and what consequences it will bring and how concerned people will be about it (Sjöberg, Moen & Rundmo, 2004). So, a risk is the chance of whether an event is likely to happen with the advantages or disadvantages it will have included (Douglas, 2013). This brings us to the risk perception of the risk of floods.
Analyzing this perception of flood risk gives us more understanding of the impact of a flood and helps us minimize the impact (Filatova, Mulde & Van der Veen, 2011; Shen 2010). So, by analyzing flood risk perception we help reduce the impact of floods (Filatova, Mulde & Van der Veen, 2011; Shen 2010). And because the increase in floods is caused by climate change, we reduce climate change effects by reducing the impact of floods (Few, 2003). So, when we analyze the perception of flood risk, we can reduce climate change effects.

I.II Main question and sub-research questions

This research intends to better understand which factors influence the perception of people of flood risks and whether and how the occurrence of flooding events can contribute to changing the perception of actual and future flood risks. This research

will be conducted in the city of Arcen hit by floods in July 2021. The focus will be on if and how the experiences of the floods in July 2021 in Arcen have changed the inhabitant's perception of flood risk and climate change. With this focus, I hope to contribute to the research field of flood risk perception.
That brings me to the main question, phrased as follows:

Has the flooding event in July 2021 in Arcen changed the perception of people of climate change? If yes, how?

Sub-questions of this research question will be:

- Which factors affect the perception of flood risk of the inhabitants of Arcen?
- Has the event that occurred in July 2021 enhanced the awareness of climate change?
- Have the inhabitants of Arcen taken measures for flood risk management after the floods in July 2021?
- Have they learned from the experience?
- What expectations do the inhabitants of Arcen have for future floods and government management?

I.III Relevance

Scientific relevance

Over the past decades, a burgeoning scientific literature has investigated the perception of people of climate change (IPCC, 2007; Ipsos, 2019; IPCC, 2021; Ipsos, 2021) and emphasized the potential contribution of local communities to climate change adaptation (Adger, 1999) and to flood adaptation specifically (Chan & Parker, 1996; Davis & Hall, 1999; Twigg et al., 2000; Mysiak et al., 2013; Mees et al., 2018; Thistlethwaite et al., 2018; Puzyreva et al., 2022). The flooding events in Arcen in July 2021 may help us to deepen the issue of the perception of people of climate change and whether and how it was affected by such an event.

The use of theoretical frameworks or theories about flood risk perceptions are not much used in literature so far (Kellens, Terpstra & De Maeyer, 2013; Bubeck Botzen & Aerts, 2012). But when analyzing risk perception two basic approaches came forward: Constructivist and rationalist (Birkholz, Muro, Jeffrey & Smith, 2014).

The constructivist approach focuses on the subjectivity of threats. The evaluation of threats is dependent on the social system the respondent is in, they are socially constructed. This means the culture, norms, values and beliefs the respondent has influenced the evaluation of the threat (Lechowska, 2021).

The rationalist approach focuses on modelling, characterizing and predicting behaviour concerning threats (Birkholz, Muro, Jeffrey & Smith, 2014). It is about how people judge the positive and negative outcomes of a risk that affects their individual preferences and behaviour (Lechowska, 2021). The rationalistic approach assumes that a threat stimulates an individual to judge that threat and to have a rational process of deciding what to think of it and how to react to it (Birkholz, Muro, Jeffrey & Smith, 2014). An important paradigm within the rationalistic approach is

the psychometric paradigm (Birkholz, Muro, Jeffrey & Smith, 2014). This paradigm is developed to quantify the individual perception of risk. It assumes that individuals clarify the world in cause-and-effect patterns and with a cognitive pattern it is possible to model a phenomenon (Kellens, Terpstra & De Maeyer, 2013).

In this research, we will use the psychometric paradigm for analyzing flood risk perception. The psychometric paradigm is a theory that dominates the research about flood risk perception (Terpstra, Gutteling, Geldof & Kappe, 2006; Birkholz, Muro, Jeffrey & Smith, 2014; Lechowska, 2021), which makes it a better fit for this research. This paradigm looks at risk as a cognitive construct that can reveal a lot of quantitative levels of evaluation (De Marchi, 2007), which makes this also a good paradigm for this research because this research has a quantitative approach.

Analyzing flood risk perception is a very important aspect when we are talking about flood risk management (Schanze 2007). When the perception of flood risk is analyzed, the impact of a flood comes clearer. This clarity of the impact ensures better management of the impact of the flood risk next time (Filatova, Mulde & Van der Veen, 2011; Shen 2010). So, when this research will analyze the perception of flood risk of the inhabitants of Arcen, it will also tell us more about the impact of the flood and therefore the flood risk management for the village (Filatova, Mulde & Van der Veen, 2011; Shen 2010; Birkholz, Muro, Jeffrey & Smith, 2014). When looking at flood risk management we can also see if the inhabitants of Arcen did adapt to the increase in flood risk. Meaning if they did adapt to climate change.

So, analyzing flood risk perception is important, but what makes this research so different from other research is the direct link between experiencing the risk events instead of hearing about them. This direct experience makes this research far more interesting than the existing studies about risk perception (Slovic, 2000; Shen, 2010; Lechowska, 2018). It will contribute to the literature on the perception of people of climate change and how their perception changes or not after these events. That may contribute to the field of research my research and other research belong to.

Societal relevance

On a societal level, this research can give us more insight into what people's perception is and how they react to such risky events as flooding. But also, about what the local government's response is to climate change-related issues such as floods. In November 2021 research about what people in the Netherlands think about climate change came forward (Ipsos). More than 69 percent of the inhabitants of the Netherlands worry about global warming. 59 percent worry about the problems it will cause for the Netherlands. This does not seem to be significantly more than in 2019, which then was 55 percent (Ipsos, 2019). But what did change was how people in the Netherlands thought about the debate about climate change. In 2019 the answer to that question was indifferent, but now at least 48 percent do not think the debate is overrated (Ipsos, 2021). So according to the report from Ipsos (2021) people in The Netherlands do worry about global warming. This said four out of ten people in The Netherlands think that the government is doing too little

against climate change (Ipsos, 2021). So, the inhabitants of the Netherlands are more aware of climate change than a few years ago, but still, only 40 percent think that the government is doing too little against it, so there is still work to be done.

As the risk perception of the inhabitants is more understood, the government can make a policy decision easier (Botzen, Aerts & Van den Bergh, 2009; Heitz, Spaeter, Auzet & Glatron, 2009). So, researching risk perception gives more understanding of public responses to hazards. But also improves communication and knowledge about hazards (Samuels, 2009).

Flood risks are becoming more often and more extreme which represents a threat that is increasing to society and local communities (Few, 2003). Therefore, there must be more attention to flood risk management and improving it. When improving flood risk management local communities should take part in it (Few, 2003). Earlier studies (Samuels, 2009; Mileti, 1980; Lave en Lave, 1991; Whyte 1986; Filatova, Mulde & Van der Veen, 2011) show us that the perception of people influences how they actively cope with extreme events like floods. Which makes it very important for local communities to participate in flood risk management because they live through it and experience it. When there is more knowledge about risk, the decision gets more facile on how to manage the flood risk next time (Samuels, 2009). We already see this participation across Europe with for example local flood groups and dike watchers (Puzyreva et al., 2022; Mees et al., 2018).

When it comes to Arcen there has not been any research about the perception of flood risk or climate change. It is very interesting to see if such extraordinary events influenced the perception of the inhabitants on flood risk and climate change. This analysis could also translate into environmental organizations or the government that gain a broader knowledge about stimulating people to go against climate change. The local flood risk management or local flood policies for Arcen could change and improve (Schanze 2007). During the flood the response of the inhabitants of Arcen was quite extraordinary. The people in Arcen acted on the risk with a sort of survival mode and started to make an emergency dike (NOS, 2021e). The case study is interesting for the role played by people living there, because it demonstrates that local communities can play an important role in flood risk management.

II Theoretical framework

To understand the theory that will be used to analyze the results of the research better, we will first look at the definitions of risk perception and especially flood risk perception.

II.I Risk perception and implication for flood risk management

Perception

Everything we know is based on or derived from a certain form of consciousness, a perception. It is the contact that humans have with the world around them. How they conceive the information around them in their brains and imagine something. This concept and study of perception has always been important in philosophy and science because all knowledge based on ideas comes from this form of consciousness (Efron, 1969). Perception is the way you think about something and what your idea of it is like. It is the way you observe some things with your senses and your ability to understand them fast (Qiong, 2017). Perception is developing awareness or understanding the information. The word perception comes from the Latin word ‘percepio’, which means receiving, collecting, taking possession and adjusting your senses and mind (Qiong, 2017). The process of creating a perception has three faces: selection, organization and interpretation. Nowadays there is so much information that we cannot possibly know everything. We would experience an overload of information and disorder. Through our environment, we experience only a part of the information, a selection (Qiong, 2017). When we have collected the selected information, we need to organize it in meaningful patterns. This will be accomplished by putting the things around you in categories. After this, the phase interpretation comes up. This is about giving meaning to what you know. Culture plays a big part in this, because it has a big influence on how we give meaning to situations or experiences (Qiong, 2017).

Perception of risks

Perception has an important role to play when it comes to reacting to a risk. So, analyzing risk perception became very important in recent literature and further research (Birkholz, Muro, Jeffrey & Smith, 2014). Risk perception is per definition a knowledge or belief in the gravity of a threat to the environment or experiencing one (Mileti, 1980). The perception of risks is developed by everyday processes where people do not use statistical values or models. So, developing a perception is not a scientific process. It is mostly influenced by attitudes, intuition, expectations and information about hazards (Samuels, 2009). Perception is developed with a selection of information that is filtered through our environment. Our environment decides what we experience as a risk, for example, the location of where we live (Qiong, 2017). The people in an area where floods happen often possess more information because their selection of information was influenced by their environment. Therefore, those people can create more expectations, attitudes and intuition about the perception of flood risk. So, the inhabitants of an area where a lot of floods happen are expected to have more of a risk perception of floods than inhabitants of an area who never experienced a flood before (Samuels, 2009).

Understanding risk perception is essential to investigate how society reacts to risks but also to defining priorities. How a society reacts to a risk can tell us a lot about where the problems lay in the management. Further, it can help to effectively use resources and communicate information about risks from experts. How more understandable the perception of risk is, how more than can be argued on solutions for the best option. The communication of this knowledge about risks will improve the reaction to the risk in the future (Lave en Lave, 1991; Samuels, 2009).

Flood risk perception

Flood risk perception is the risk perception, the judgements of impact and consequences and how a response is developed, due to a hazard like a flood (Birkholz, Muro, Jeffrey & Smith, 2014). Understanding the risk perception of floods has been of value for a long time now, at least since 1945, because of the dangers of floods that occurred (Whyte 1986). Flood risk perception is recognized as one of the most important aspects of analyzing risks when it comes down to flood risk management (Schanze 2007). When the flood risk perception of the inhabitants is more understood, a policy or decision is easier to make (Botzen, Aerts & Van den Bergh, 2009; Heitz, Spaeter, Auzet & Glatron, 2009). Flood risk perception is therefore not only important for measuring and analyzing the impact of a flood but also for minimizing the impact (Filatova, Mulde & Van der Veen, 2011; Shen 2010).

The existing scientific literature emphasizes the importance of the flood risk perception of local communities for the following main reasons. It contributes to enhancing local community engagement in climate adaptation. Floods are part of climate change (Few, 2003). And therefore, flood adaptation is part of climate change adaptation (Nye, Tapsell & Twigger-Ross, 2011).

Analyzing the perception of people will also improve the local government of flood risks. It will give us more insight into which people are involved and how the government can improve their policies by containing more experience and therefore more data and information (Botzen, Aerts & Van den Bergh, 2009; Heitz, Spaeter, Auzet & Glatron, 2009).

This leads to a better strategy and preparedness and therefore to a more resilient management. It is to strengthen the resilience of local communities and to improve their response to floods. It will make a society more defensible to floods (Samuels, 2009).

When the perception of flood risk is not taken seriously, the improvement of their response to floods will be less successful. The more floods that will occur, the more they can contribute by analyzing the flood risk perception and therefore stimulate the changes in policies and strategy plans against floods (Nye, Tapsell & Twigger-Ross, 2011).

Flood risk perception and the psychometric paradigm

The psychometric paradigm is a leading theory used for risk perception. It was developed in the seventies by Paul Slovic, Baruch Fischhoff and others (Terpstra, Gutteling, Geldof & Kappe, 2006). They stated that risk is a subjective concept. The perception of risk is not objective and independent of our minds and culture. The

subjective concept of risk is about personal opinions and feelings that influence individual interpretations. It is not only based on observational facts (Terpstra, Gutteling, Geldof & Kappe, 2006). The concept of analyzing perception is developed to support people to handle difficult and dangerous situations (Slovic, 2000).

The psychometric paradigm stated that a lot of features and connections of risk perception could be modelled (Slovic, 2000). Features like knowledge of exposure, controllability, increasing of the risk or personal impact etcetera (Jenkin, 2006). The respondents would judge the statements about the features of a risk and therefore would create an overview of reviews about the risk perception. But a lot of features are related to each other (Slovic, 2000). So, because of all the connections that those features had, a lot of confusing analyses developed. One study could show one feature and the other could not. To improve the results of the analyses, two overall factors have been identified (Jenkin, 2006; Terpstra et al., 2006).

First, there is the rate of *dread risk*. This means an uncontrollable risk, worldwide catastrophic situations and people dying. There is a high risk for future generations. These are not easy to reduce and are likely to increase fast (Terpstra et al., 2006). It relates to how people feel about risks and desire a more emotional perspective. A dread risk can end up being a hazard with no control and fatal catastrophic consequences. Feelings like vulnerability and fear of a threat will occur. But when a situation is unpredictable or probabilistic people could also have a feeling of dread which could develop very quickly throughout the population of a city because of the sharing of feelings (Xu, Qiu, Gu & Ge, 2020). For example, in Korea seventy students ranked all nuclear risks as dread risks. These nuclear risks are nuclear war, weapons, testing, transportation and disposal (Cha, 2000). The rate of dread risk increases when people experience the threat of a risk more and want to see it reduced. The rate of dread risk is characterized by worry (Kraus & Slovic, 1988).

Second, we have the rate of an *unknown risk*. This risk is not observable and unknown or new to science. The effects are slow in increase (Terpstra et al., 2006). It relates to people's understanding of a risk and desires a more cognitive perspective. The perception of an unknown risk has a lack of knowledge and issues that are unfamiliar (Xu, Qiu, Gu & Ge, 2020). Risks are barely or completely unknown (Baum, 2015). The consequences of these kinds of risks are delayed (Slovic, 2007). For example, there is an unknown risk at farms for the usage of ionophores. This is a molecule that can transport ions across cell membranes and is used a lot as an antibiotic medicine for farm animals. It is not known yet if it can be harmful to humans. But it can cause a resistance to a type of antibiotic namely Vancomycin (Wong, 2019). The rate of how unknown a risk is, is about the awareness of the risk. It is about whether the people did have information about the risks of floods. A low rate of unknown risk can result in bad preparedness. More awareness is more worry, is more preparedness (Adelekan & Asiyanbi, 2015).

Some analysis states that there is a third one, namely *the number of people exposed*. This means that the perception of the risk is formed by how many people are at risk. But the most important are the first two, especially dread risk so these two are the factors this research will be focused on. The higher the factor is

observable, the more it becomes a bigger risk in the perception of people (Terpstra et al., 2006). The rate of how unknown and how dreadful a risk is influencing together the impact of a risk and the behaviour of people reacting to the risk and foremost the perception of flood risk (Xu, Qiu, Gu & Ge, 2020).

In this research, we will look at the extent to which these factors of the psychometric paradigm come forward in the results of this research about the flood risk that happened in Arcen. These two factors can map the risk into a Cartesian plane graph (see example Figure I). There are two lines which make a cross. One is about how unknown the risk is, with one side unfamiliar risk and on the other side familiar risk. The other line is about how dreadful the risk is, with one side low dread risk and on the other side high dread risk. So, the rate of the two factors on how unknown and dreadful a risk is, decides the location of the risk. The location of the risk in this graph helps to analyze how the risk is perceived (Jenkin, 2006). To analyze these factors, we will focus on the three main features of the perception of flood risks.

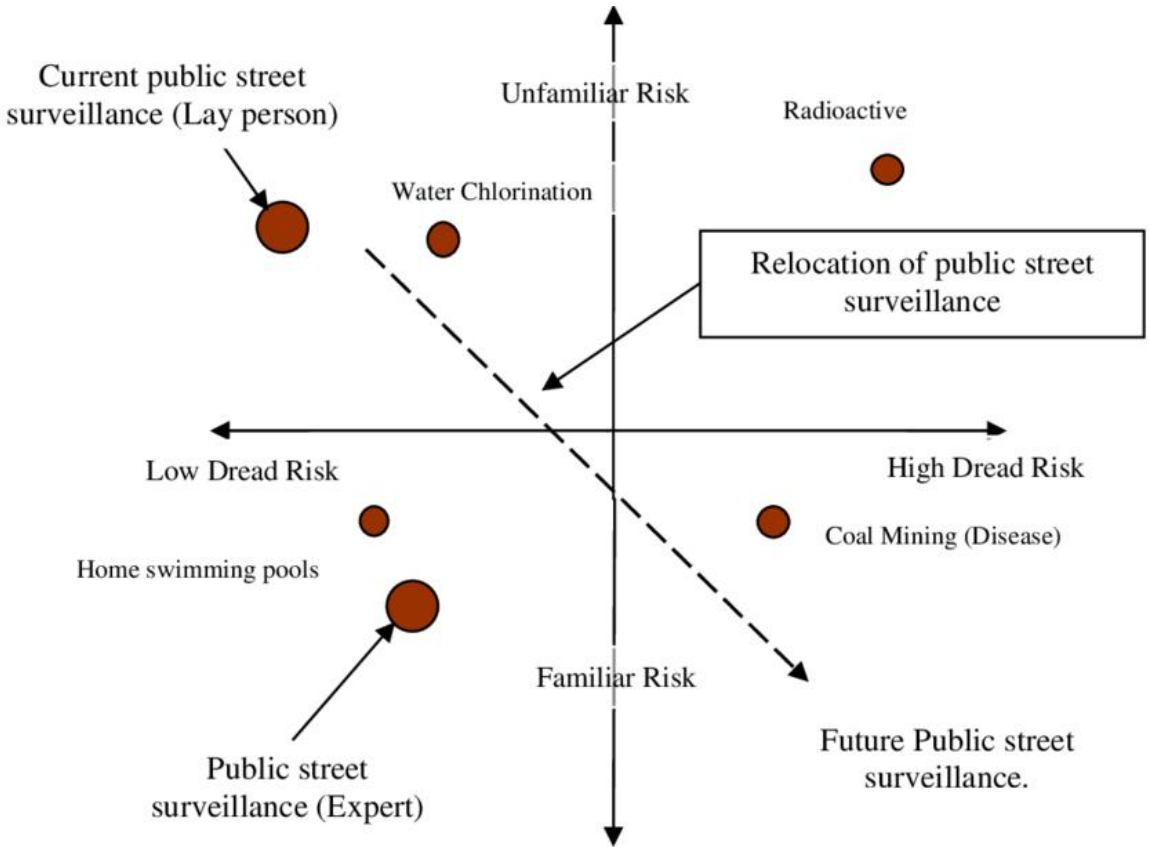


Figure I: Example psychometric paradigm (www.researchgate.net)

Different statistical methods were applied in previous studies to analyze these three features of the perception of flood risk, which are awareness, worry and preparedness (Tobin & Montz, 1997; Raaijmakers, Krywkow & van der Veen, 2008; Bradford, O'Sullivan, Van der Craats, Krywkow, Rotko, Aaltonen & Schelfaut, 2012; Lechowska, 2018).

Awareness of flood risks is defined as the knowledge or consciousness of the flood risk you are exposed to (Slovic, Fischhoff & Lichtenstein, 1984). There are

three kinds of awareness. First, we have expert awareness. This sort of awareness is the kind where the last uncertainties are, people are well informed. Second, there is the underestimation of probability, the fact that the hazard will happen or its consequences. Third, the people ignore and are exposed to the risk (Raaijmakers, Krywkow & van der Veen, 2008). Awareness of flood risks increases in a society when they are confronted with a flood hazard (King, 2000). But when events like flood hazards happen infrequently people tend to forget the awareness they had about the risk (Arthurton, 1998). An example of this phenomenon is back in 1993 when the people in the Netherlands around the Maas were not at all well enough prepared and the last flood happened in 1925. But when the flood happened two years later the inhabitants around the Maas were better prepared (Mitchell, 2003).

Worrying about flood risks is the dread of natural hazards (Slovic, Fischhoff & Lichtenstein, 1984). Worry or also called fear is depending on how often risks happen but also on how bad the consequences of those risks expectedly are. So, for example it is about whether a risk only happens once a decade or once a year. And whether the consequences disrupt your life or whether they only affect economics (Tapsell, Penning-Rowsell, Tunstall & Wilson, 2002). When more people worry about a risk, the demand to reduce the risk will grow bigger (Raaijmakers, Krywkow & van der Veen, 2008).

Preparedness originates from awareness (Raaijmakers, Krywkow & van der Veen, 2008). Preparedness is having control over the risk (Slovic, Fischhoff & Lichtenstein, 1984). If the preparedness increases, the negative consequences will be more controlled. The control of consequences can improve during the risk or after. Preparedness has four dimensions. First, there is the technical. This is where technical measures reduce material damage due to a flood. Technical measures can be dikes but also change in the construction of a building. In the social dimension, individuals act during a flood to cope with the consequences. Like the local government that should have good evacuation schemes and emergency supplies (Raaijmakers, Krywkow & van der Veen, 2008). The institutional dimension is about designing and communicating the action plan when there is a flood. Like training the emergency staff. Lastly, there is the economic dimension. The economic dimension is for example about insurance to reduce the financial risk of a flood (Raaijmakers, Krywkow & van der Veen, 2008).

The three main features: awareness, worry and preparedness all influence each other. Without awareness, there would not be worry and without worry or awareness there would not be preparedness (Mitchell, 2003; Raaijmakers, Krywkow & van der Veen, 2008). And when worry increases, people want to see the risk reduced, so their preparedness increases (Adelekan & Asiyanbi, 2015).

The three main features: awareness, worry and preparedness are influenced by situational or cognitive elements. These elements can be subdivided into situational or cognitive (Tobin & Montz, 1997). For example, situational elements are the physical location of the risk nearby (where is the flood), the intensity of the flood, the extent of the effects, the experiences, the level of hazard, the factors of population (gender, age ect.), the factors of house (basement, property, ect.), the cultural-historical context and the people influenced by the flood. Cultural context is the

environment the people have been in and how it shaped them (Lechowska, 2018). Cognitive elements are the ones that are personal of one individual and contain the emotion and behaviour of responding to a flood. They are about feelings, actions and experiences (Tobin & Montz, 1997). These factors are the level of awareness, worry, experiences, preparedness to respond to the flood and the people influenced by the flood (family). But the whole experience is most considered when it comes down to analyzing the perception of flood risk (Lechowska, 2018). Situational factors are as it implies more about the situation itself, so where the flood physically exactly is (Tobin & Montz, 1997). These are elements like the intensity of the flood, extent of the effects, factors of the population (gender, age ect.), factors of the house and the cultural context of the individual (Lechowska, 2018).

A lot of studies about flood risk perception adopt the psychometric approach which is used to examine the perception of flood risk by residents of flood-affected locations (Terpstra, Gutteling, Geldof & Kappe, 2006; Birkholz, Muro, Jeffrey & Smith, 2014; Lechowska, 2021). The paradigm is about explaining perception (Lechowska, 2018). So, in this thesis, to analyze the perception of the inhabitants in Arcen of flood risk we will use the psychometric paradigm.

The studies about flood risk perception that adopt the psychometric approach are based on quantitative analysis of individuals' perception of risk (De Marchi 2007). There is a focus on observational patterns which make sure that the perception can be modelled (Kellens, Terpstra, Schelfaut & De Maeyer, 2013). The research methods in these studies are varied. For example, surveys through phone calls or online and semi-structured or in-depth interviews (Bradford et al., 2012; Becker, Aerts & Huitema, 2014; Działek, Biernacki & Bokwa, 2014; Fitton, Moncaster & Guthrie, 2016). The sampling methods were also very broad. Like random, accidental or snowball sampling (Armas & Avram 2009; Pagneux, Gísladóttir & Jónsdóttir, 2011; Fitton, Moncaster & Guthrie, 2016). Questions were open but also closed and different statistical methods were applied to analyze the factors, like awareness, worry and preparedness, of flood risk perceptions (Kellens, Zaalberg, Neutens, Vanneuville & De Maeyer, 2011; Knocke & Kolivras, 2007; Miceli, Sotgiu & Settanni, 2008). When it comes down to using SPSS for analyzing the results a lot of tests were used, like Chi-squared, ANOVA and regression. The surveys were conducted under different circumstances, at different times and in different cultures, like in Europe and Asia (Lechowska, 2018). The focus of these studies is mostly to have an independent variable that qualifies for modelling the perception of risk.

II.II Conceptual model

In this thesis, flood risk perception will be analyzed by using the psychometric paradigm. By drawing on the existing scientific literature, as introduced above, two factors influence the perception of flood risk, namely the rate of how dreadful and the rate of how unknown a risk is (Terpstra et al., 2006). Each of these will be analyzed by looking at three main features, which are awareness, worry and preparedness (Tobin & Montz, 1997). These features are in turn influenced by

several elements. These elements can be subdivided into situational or cognitive (Tobin & Montz, 1997). Cognitive elements are all about the experience, feelings and actions, while situational elements are for example about the location of the flood, the effects and the intensity.

So, with this knowledge about the factors, features and elements influencing the perception of flood risk, I created the following conceptual model.

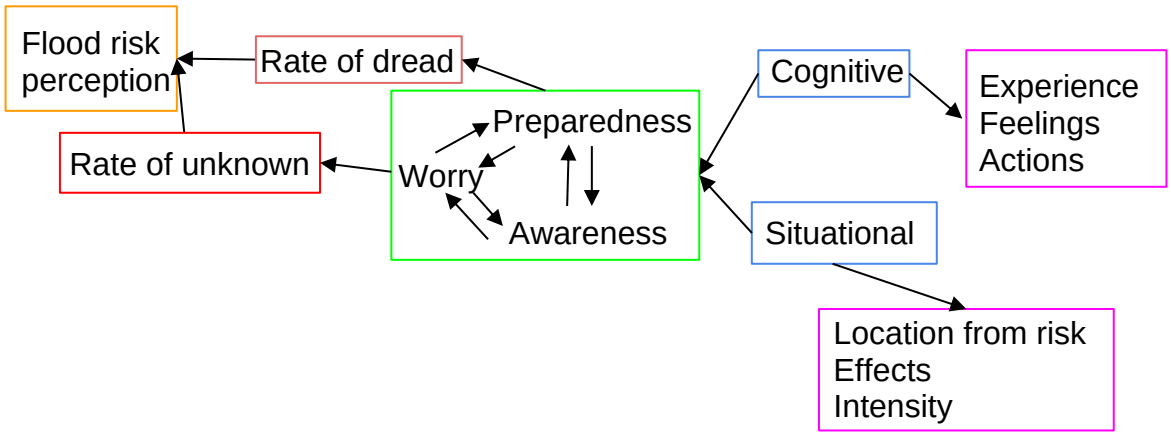


Figure II: Conceptual model

III Methodology

This research will adopt both qualitative and quantitative research methods. To begin, this study starts with a qualitative literature review which is conducted to explain the concepts of climate change, flood risk and what factors, features and elements influence the perception of flood risk. So, the qualitative research method will be integrated with a quantitative research method for collecting and analyzing data about how an event influenced the factors, features and elements that influence the perception of flood risk.

Goal, hypothesis and aim

The goal of the questionnaire is to collect data to answer the main research question and sub-research questions of this thesis. So, the questionnaire must answer how the flooding event in July 2021 in Arcen has changed the perception of people of climate change. Also, what factors affect the perception, if the awareness of climate change increased and if the inhabitants of Arcen took measures for flood risk management.

The hypothesis that will be tested in the survey is as follows. The perception of flood risk is influenced by the rate of how dreadful or unknown a risk is to people. Those factors are influenced by three main features: awareness, worry and preparedness. These three features are influenced by cognitive and situational elements. Cognitive elements about the experience, how they felt and what they have done. And situational elements are about the location, effects and intensity of the flood that people pass through. All these things influenced the perception of people on climate change. So, I hope to find in the results that the rate of the dreadful risk increased, this because the event was extremer than most inhabitants of Arcen ever experienced. But the rate of the unknown risk decreased because the inhabitants met the risk and now know more about it. This is due to the increase in the features; awareness, worry and preparedness. Which all influence each other. Without awareness, there would not be worry and without worry or awareness, there would not be preparedness (Mitchell, 2003; Raaijmakers, Krywkow & van der Veen, 2008). Further, I hope to find in the results that the cognitive elements influenced the features because of the experience, feelings and deeds the inhabitants underwent. And the situational elements influenced the features because it mattered where the inhabitants were located, what effect it had on them and what the intensity of the flood was.

The aim is to have at least two hundred respondents, who all live in Arcen or lived in Arcen during the floods in July 2021. Arcen has 2440 inhabitants so a respondent's group of two hundred seems doable. The age will be between 15-80+, which will be scaled into categories of 15-24, 25-34, 35-49, 50-79 and 80+. This is interesting because a lot of younger but also older people helped to build the emergency dike and I am interested in if and how their perception changed. To encourage respondents to fill in the survey, this will be sent via social media, such as WhatsApp to all the people I know who live in Arcen and fall under the requirements of the respondent's group. This is expected to be the best way to get as many respondents as possible, because it is easy to fill in the answers on your phone. There is also a Facebook page for the people that live in Arcen, so I will send the survey there as well. And there is an email from the village council I will send the survey to with the question if they want to spread my survey.

Questionnaire

The respondents will be asked questions through a survey questionnaire to better understand the perception of flood risk of the inhabitants of Arcen and if it changed. The survey will be made with the program Qualtrics online. The survey questionnaire will be in a closed-ended format. That means that respondents will be asked to choose from a set of answers.

To ensure the validity and quality of this questionnaire the survey will be pilot tested to see if it takes ten minutes and if the questions are good to understand, comfortable to answer and if there is any room for improvement. Ten respondents who do not live in Arcen will fill in the survey and give me a lot of feedback on how to improve the survey on formulation, options and if the questions are easy to understand. After that, the survey questionnaire will be sent to the inhabitants of Arcen who lived through the events of July 2021. The questionnaire will be in Dutch. This is because otherwise a lot of inhabitants would maybe struggle to fill in the survey.

The questionnaire is divided into four different categories. The first category of questions will be about the profile of the respondents, for example age, gender, level of education and if they live in Arcen as a control question. The second category of questions will be about the cognitive and situational elements of the inhabitant. For example, questions concerning cognitive elements include what their feelings were, if they for example experienced stress, what their actions were, what they think of the whole experience and how much exposure they felt during the flood. And situational questions are about how far they live from the dike, what effects the flood had when it came down to damages and how they rate the intensity. The third category will include questions about how they would rate their worry, awareness and preparedness before and after the flood. The last category will be questions about their perception of flood risk and if it changed, what influenced that change the most, if they think they learned from the experience, if they think the government should take more part in flood risk management and if they expect these kinds of floods will happen again.

There will be dichotomous questions with the answers yes or no. There will be some questions where the respondents can rate their answers on a scale of 1 to 3 if they agree or not or somewhat, for example whether they think they are more prepared after the flood. There also will be a few questions where there will be multiple choice options to fill in and questions with an option ‘other’, for example when it comes down to how the respondents experienced the flood. The option ‘other’ is to prevent the respondents from filling in nothing if they do not feel that the other given answers suit their opinion. The goal of the question will decide what form it will have. So, when the goal of the question is to get a yes or no answer, that will be the two options you can choose from. For the position of the researcher or saying so, there will be paid attention to not let the questions on the questionnaire be biased. There will be twenty questions and the survey will cost a maximum of 5 minutes to fill in.

Data processing

After all the data has been collected and put down in a dataset, the program SPSS will be used to analyze the data by doing some tests of variables and researching if they correlate. To analyze the data there will be chi-square tests with the coherence measure Cramer's V or tests with the coherence measure Kruskal-Wallis. The chi-square test is to assess if there is an association between the variables. The Cramer's V and Kruskal-Wallis measures assess the strength of this association.

For the chi-square test, you need Cross-tabulations (Field, 2018). Cross-tabulations are fit for variables that are nominal. With the help of percentage and coherence measures such as the chi-square, we can see whether there is a correlation between these variables and whether the correlation is strong. For example, you can see whether men or women have changed their perspective on something. The chi-square measures the correlation but depends on the number of respondents. The coherence measures such as Phi and Cramer's V do not depend on the number of respondents (Grotenhuis & Matthijssen, 2013). To get to the value of Cramer's V, you need the value of chi-square (Field, 2018). Phi and Cramer's V are always the same when at least one variable has only two categories. Cramer's V then has the preference to use (Grotenhuis & Matthijssen, 2013). Cramer's V only measures the coherence between nominal variables. This means that every value can only belong to one category. So, the questions where you can give multiple answers do not fit with this coherence measure. When Cramer's V is 0, then the variables are independent of each other. If it is bigger than 0, then the variables are dependent (Field, 2018). The aim is to get a value of 1, but in practice that is never accomplished (Grotenhuis & Matthijssen, 2013). A value above 0,5 is strong, between 0,2 and 0,5 reasonable and below 0,2 very poor (Field, 2018). Chi-square testing is fit for variables that have a nominal measurement level.

The test with the coherence measure Kruskal-Wallis is fit for analyses between variables that are ordinal or variables with one ordinal and one nominal. The categories of the variables also need to be independent of each other. For example, when the analysis is about the coherence between the hair color of the respondents and what they thought of a certain experience. If the P-value is smaller than 0,05 then there is a coherence between the variables. That concludes in that the means of the paired observations are significantly different from each other (Field, 2018).

So, to analyze the data that we need, we need the correct data to process. Data that will show us by doing these tests if the hypothesis of this research is true. The conceptual model shows what the variables are when it comes down to researching the risk perception of the inhabitants of Arcen. There will be tests of the correlation between the cognitive and situational elements and worry, preparedness and awareness. Then there will be tests to see if there is a correlation between the three main features, preparedness, worry and awareness with a change in the perception of flood risk. Also, there will be a test to see if there is a correlation between the change in perception of flood risk and the increasing awareness of climate change. The questions in the survey about these elements, features and factors will give us the correct data to see if two variables are dependent on each other.

There will be tests between the following data, and therefore the following questions in the survey.

Test with question(s)...	… and question(s)	Data received/needed
5 t/m 7	12: Worry after the flood?	Link between situational elements and feature worry after flood
5 t/m 7	13: Awareness after flood?	Link between situational elements and feature awareness after flood
5 t/m 7	14: Preparedness after flood?	Link between situational elements and feature preparedness after flood
8 t/m 11	12: Worry after the flood?	Link between cognitive elements and feature worry after flood
8 t/m 11	13: Awareness after flood?	Link between cognitive elements and feature awareness after flood
8 t/m 11	14: Preparedness after flood?	Link between cognitive elements and feature preparedness after flood
12: Worry after the flood?	16: Did perception change?	Link between feature worry and change perception flood risk before and after flood
13: Awareness after flood?	16: Did perception change?	Link between feature awareness and change perception flood risk before and after flood
14: Preparedness after flood?	16: Did perception change?	Link between feature preparedness and change perception flood risk before and after flood
12 t/m 14	12 t/m 14	If the three features worry, awareness and preparedness influence each other
15: Perception flood risk rate before flood	17: Perception flood risk rate after flood	How high is the flood risk estimated
16: Did perception change?	18: Have you learned from experience?	Link between change perception and if the inhabitants learned from the experience
16: Did perception change?	19: Expect the government to improve flood risk management?	Link between change perception and expectation government
16: Did perception change?	20: Expecting other floods in future?	Link between change perception and expectation other floods
16: Did perception change?	2 t/m 4: Age, gender and education.	Link between respondent profile and change perception flood risk

During the data processing with SPSS, I will look if there are also other tests or analyzes that fit or are needed for the kind of research questions and answers to get the best results of analyses. For example, this depends on whether the variables are nominal or ordinal.

Data analysis

When all the data has been processed, we will analyze the results with the psychometric paradigm. For this, we will use the factors of how dreadful and unknown the risk is. To analyze how dreadful the risk was, we will derive information from if they are worried now about the risk. And to analyze how unknown the risk was, we will derive information from how aware they were of the risk. We will measure how dreadful and unknown the risk of the flood was. This will give us an analysis and psychometric paradigm on how the perception of flood risk is perceived. There will also be an analysis of how the flood risk perception has changed. For this, we will look at the correlations between the elements and features, awareness, worry and preparedness. After that, the correlations of the features will help us analyze the results and conclude how and by which factors the perception of flood risk was influenced. The analysis will be discussed, and a conclusion will be drawn to answer the main research question.

III.I Case study selection

The flood in Arcen in July 2021

When I was thinking of a certain case to study, I thought about the case of the floods in July 2021 in Arcen, because my parents live there. A lot of people that I know experienced this flood firsthand. It all started on the 13th of July 2021 when inhabitants of places in Limburg like Beek, Valkenburg and Weert were warned about the heavy rainfall that would originate the following days (NOS, 2021a). No one had imagined what would follow the next few days not only in Limburg but also in Germany and Belgium. Later that day the first notifications of flooding were reported. That night a lot happened. From people watching tv on the couch to only seconds later people who had to leave their house swimming (NOS, 2021b). Two days later the effects of the floods were horrifying. In Germany, there were tens of deadly victims and in Belgium people died. The mud streams washed away whole houses and environments (NOS, 2021c). The water was gone where it began but it was flooding downhill in every direction. Everywhere were evacuations starting and thus also in Limburg near the Maas. This river was rapidly climbing with her water level from place to place closer to the sea. When Valkenburg was already starting to clean up the mud, the water level in Roermond was beyond what it had ever been. The water was moving. It was moving fast (NOS, 2021g). During the night from the 16th of July to the 17th of July, the water reached the city of Venlo. That day 10.700 people were evacuated in and near Venlo under which 200 patients of the hospital (NOS, 2021d). Also, the inhabitants of Arcen were instructed to leave the village. But that night a lot of inhabitants of Arcen did not leave the village. They built an emergency dike to ensure the possibility that the water would not flood the village (NOS, 2021e). The following day inhabitants of Arcen walked alongside the dike to

watch if there were places where the dike was breaking. The next day the water level was already lower and after a few days, the water level was what it was supposed to be. The threat had passed, and normal life came back to the village (NOS, 2021f).

A lot happened those few days in July 2021 and people in The Netherlands, Germany, France, Belgium and Luxembourg experienced difficult situations where they had to flee their homes or were scared, they would lose their homes. And in the worst situations, people lost their homes and, in some cases, even their life (Ipsos, 2021). Shortly followed a report from IPCC (2021) about climate change in 2021 and what effects we could already experience, like extreme weather conditions like high rainfall for example the floods in July 2021.

IV Data processing

First, I sent out the survey to everybody I know who lives in Arcen if I had their telephone number and emailed it to the village council. The village council did not reply so I do not know if they sent the survey out or not. I shared my survey also on the Facebook page of a group with only people who live in Arcen. I had 191 respondents. 15 respondents were not filled in and there were answers where they filled in that they did not live in Arcen. So, then I had 176 respondents. But working with the dataset that I downloaded from Qualtrics I found out that some respondents did not fill in the entire questionnaire. So, the last question has not 176 respondents but 150 respondents. After a full week, I closed the survey, so I could go on with the dataset. I could easily download the dataset for SPSS from Qualtrics which made adjusting the dataset a lot easier. Also, on Qualtrics I could see what the answers were in percentages, numbers and bar charts. Which helped a lot next to SPSS to analyze the results.

So, before I could start the tests, I had to make sure that the dataset was correct to use. Some answers were filled in by the option 'Different' I checked and still assigned a certain answer within the other options because they were pretty much the same as one of the options they could have chosen. For example, one respondent had filled in with the option different that the experience was intense, which was literally one of the options of the other answers.

When the respondents could fill in more options than one, the variables were not well processed when it came down to the answers. The categories of the variable were all independently a variable instead of one variable with those categories. So, to continue the chi-square tests I had to develop the variables about the categories of the same question into one variable. With one question there was still only one answer given by all the respondents, namely the question about if they had any damage to their property, so I changed that one into one variable. For the answers to questions ten and eleven, I had to recode those variables into one variable with 'Recode into Different Variables' (see output SPSS part IA). Two new variables Q10 and Q11 developed that contain all the different variables about those questions. Then I added sufficient value-names to the variables because this would show better and more uncluttered in SPSS (see output SPSS part IB).

In the first place, I wanted to use the coherence measure Cramer's V with Chi-square testing. But once I saw that a lot of my answers were scaled and therefore ordinal, I decided to use the coherence measures Kruskal-Wallis also.
To analyze some variables on their own, the frequencies were analyzed (see output SPSS part X).

As shown in the table in the methodology there will be quite some tests between variables. So, we begin with tests between questions five, six and seven about situational elements and question twelve about the feature worry. For these tests, the analyses will be done with Kruskal Wallis, because the variables are independent and because one variable is ordinal (question five until seven) and the

other nominal (question twelve, see output SPSS part II). After the test with the variables about situational elements and if the worry about flood risks is changed, the same test with Kruskal Wallis was run with the variables about the situational elements and whether the features awareness and preparedness of the respondents are changed (see output SPSS part III & IV). This is because the variables about their awareness and preparedness have changed (questions thirteen and fourteen) are also nominal and independent. So that makes the Kruskal Wallis test perfect.

As for the tests between the variables about cognitive elements (question eight until eleven) and the variables about whether the respondents their worry, awareness of preparedness changed (question twelve until fourteen), the following tests were done. The variables about cognitive elements are all ordinal variables except the variable about whether respondents think that floods can threaten their safety (question nine). Further, all variables are independent of the variables about the features worry, awareness and preparedness. So, when it comes down to the variables about how the respondents felt during the flood (question eight), what the actions of the respondents were during the flood event (question ten) and what the respondents thought of the experience (question eleven) the Kruskal Wallis test was performed (see output SPSS part V). Because the variable on whether respondents feel threatened by floods or not is nominal (question nine), there was a chi-square test with the coherence measure Cramer's V performed with the variables about the features worry, awareness and preparedness (see output SPSS part VI).

Moving on the coherence between the three features, worry, awareness and preparedness (questions twelve to fourteen) with the variable if the perception of respondents changed (question sixteen) is tested. These variables are all nominal so there will be a chi-square test with the coherence measure Cramer's V (see output SPSS part VII). There also will be tests between the different features to see if they influence each other. These also will be done with a chi-square test with the coherence measure Cramer's V (see output SPSS part VII).

Then the coherence between the variables about how the respondents ranked their perception of flood risk before and after the floods in Arcen July 2021, was tested (questions fifteen and seventeen). These variables are ordinal and independent, so the Krukas-Wallis test was performed (see output SPSS part VIII). This test was also performed to see if there was a coherence between the variable about if the respondents have learned from the experience (question eighteen) and the variable if their perception of flood risk has changed. Because one is ordinal, and one is nominal, they are both independent (see output SPSS part VIII).

To see if there is any coherence between the variables about the expectations about floods and government (questions nineteen and twenty) and the variable whether the perception of flood risk changed for the respondents, the chi-square test with the coherence measure Cramer's V was performed (see output SPSS part VIII). Because there are both nominals.

At last, the coherence between the respondent's profile (questions two to four) and the variable about whether the flood risk perception is tested. The test for the variables gender (question three) and whether the flood risk perception of respondents changed was the chi-square test with the coherence measure Cramer's V (see output SPSS part IX). Because they are both nominals. For the age (question two) and education (question four) variables with the variable about whether the flood risk perception changed or not, the Kruskal Wallis test was performed (see output SPSS part IX). Because the variables are ordinal and nominal but independent.

V Data analysis

V.I Analysis SPSS

Variables analyses

So we start with the analyses of some variables on their own. For this, we looked at the frequencies of the variables whether the respondents expect other floods or expect that the government will take measures, if the respondents have learned from the experience and if their perception of flood risk changed (see output SPSS part X).

When we look at the variables on whether the respondents think their worry, awareness and preparedness changed, they all look pretty much the same. With the variable whether the respondents think their worry changed, only 16 percent filled in that their worry did not change. So, most of the respondents felt that they are more worried. With the variable whether the respondents think their awareness changed, only 22 percent filled in that their awareness did not change. So, most of the respondents felt that their awareness increased. With the variable whether the respondents think their preparedness changed, 40 percent filled in that their preparedness did not change. This means almost half of the respondents do not think their preparedness has improved. What is remarkable to see, is that the rate of whether their worry changed is highest and the rate on whether their preparedness changed is lowest. With the rate of whether the awareness changed in the middle.

When we look at the variable about whether respondents expect other floods, 86 percent filled in they do expect that. So, most of the respondents think that floods will happen again. When we look at the variable about whether respondents expect the government to take measures, 77 percent filled in they do expect that. So, most of the respondents think that the government will take measures.

The variables about whether the respondents learned from the event show us the following. 44 percent filled in that they gained consciousness of floods but not more than that. 27 percent also gained consciousness but do not think that it is necessary to do preparations. 13 percent gained consciousness about floods and prepared for future floods. Only 6 percent filled in that they learned nothing. So, most of the respondents think that they learned from the flood. But still, many respondents did not make any preparations for future floods.

When we look at the variable about whether the perception of flood risk of the respondents changed, 51 percent filled in it changed. So, if the perception of flood risk of the respondents changed or not is quite even.

Situational elements with the features worry, awareness & preparedness

The first test was between the variables about the situational elements and the feature worry. The analysis will show us if the situational elements influenced whether the worry of the respondents has changed about flood risk or not. So, if you look at the output of SPSS part II (see Attachments; Outputs SPSS) about this test we can see that the P-value of the Kruskal Wallis test is not significant with the variables about how far the distance of the respondents their homes is from the dike or if inhabitants experienced damage. But when it comes to how they rate the intensity of the flood, the P-value is smaller than 0,05. So, this means there is a coherence between the variable on how the respondents rate the

intensity of the flood (question seven) and whether their worry about flood risk changed (question twelve). With the variable about how the respondents would rate the intensity of this flood, they could choose between small, normal and severe. When we look closer to the output we get from this test, we can see that when respondents chose that the intensity of this flood was normal or severe (so not small), they also chose that their worry for flood risk changed a little or more. So, here we can see that the intensity of the flood did influence the change in worry.

Then the coherence between the variables about situational elements was tested with the variable of the awareness changed about flood risk. So, if you look at the output of SPSS part III (see Attachments; Outputs SPSS) about this test we can see that the P-value of the Kruskal Wallis test is not significant with the variables about how far the distance of the respondents their homes is from the dike or if inhabitants experienced damage. But when it comes to how they rate the intensity of the flood, the P-value is smaller than 0,05. So, this means there is a coherence between the variable on how the respondents rate the intensity of the flood (question seven) and whether their awareness of flood risk changed (question thirteen). With the variable about how the respondents would rate the intensity of this flood, they could choose between small, normal and severe. When we look closer at the output we get from this test, we can see that when respondents chose that the intensity of this flood was normal or severe (so not small), they also chose that their awareness of flood risk changed a little or more. So, here we can see that the intensity of the flood did influence the change in awareness.

So, when it came down to the analysis of whether there was a coherence between the change in the preparedness of respondents and the situational elements, there was no significant relation found (see output SPSS part IV).

Cognitive elements with the features worry, awareness & preparedness

Then the coherence between the cognitive elements and the features worry, awareness and preparedness were tested. When we look at the output of the test between the variable about how the respondents felt during the flood and the variables on whether the features worry, awareness and preparedness of the respondents changed (see output SPSS part V), we can see the following. The variable about how the respondents felt during the flood has no coherence with whether the worry of flood risk of the respondents has changed. The P-value is bigger than 0,05. But we can see in the bar charts that no respondents felt no fear (chose the option: I was not scared) and chose that their worry changed a little or more. Further, the variable about how the respondents felt during the flood has also no coherence with whether the awareness of the respondents has changed. The P-value is bigger than 0,05. But here we can also see in the bar charts that no respondents felt no fear (chose the option: I was not scared) and chose that their awareness changed a little or more. When it came down to the coherence between the variables about how the respondents felt during the flood with whether the preparedness of the respondents had changed, there was also none found. But here we can see in the bar charts that all respondents that felt no fear (chose the option: I was not scared), chose that their preparedness changed.

When it comes down to the variable about what actions the respondents did during the flood, we can see that it has no coherence with whether the worry of the respondents has changed. The P-value is bigger than 0,05. In the bar charts, we can see that nothing is

remarkable. For the variable about what the respondents experienced there is coherence with the variable about whether the worries of the respondents have changed. The P-value is smaller than 0,05 and in the bar charts, we can see a significant difference between what respondents chose when it came down to what they experienced and if their worry for flood risk changed a little or more. When respondents chose a higher value of experience, which means they were more scared or shocked by the flood, they also chose more often that their worry changed and not just a little.

When it comes down to the variables about what actions the respondents did during the flood and about what the respondents experienced, we can see that it has no coherence with the variables about whether the awareness or preparedness of the respondents has changed. The P-value is bigger than 0,05. In the bar charts, we can see that nothing is remarkable.

Then the test for the variable on whether respondents feel threatened by floods or not (question nine) and his coherence with the variables about the features worry, awareness and preparedness were performed (see output SPSS part VI). So, for the value of Cramer's V, a value above 0,5 is strong, between 0,2 and 0,5 reasonable and below 0,2 very poor. As we can see in the output there is a reasonable coherence between the variable on whether respondents feel threatened by floods or not with the variable about whether the worry of respondents has changed. Because the value of Cramer's V is bigger than 0,2. This means that if the respondents filled in that they do think floods can be a safety threat to them, they rarely filled in that their worry about flood risk did not change. In other ways, the respondents who do not feel their safety is threatened by floods, rarely fill in that their worry changed completely. The variables about change in awareness and especially preparedness have a poor coherence with the variable whether the respondents think their safety is threatened by a flood, because the value of Cramer's V is smaller than 0,2.

Features worry, awareness & preparedness with change perception flood risk

Then the chi-square test for the analysis of the coherence between the three features, worry, awareness and preparedness with the variable if the perception of respondents changed, was done (see output SPSS part VII). So, for the value of Cramer's V, a value above 0,5 is strong, between 0,2 and 0,5 reasonable and below 0,2 very poor. As we can see in the output there is a reasonable coherence between the variable on whether the worry for flood risk of respondents has changed or not with the variable about if the perception of flood risk of the respondents has changed or not. Because the value of Cramer's V is bigger than 0,2, but smaller than 0,5. This means that the change in worry of flood risk also gives a change in flood risk perception. For the coherence between the variable on whether the awareness of flood risk of the respondents has changed or not with the variable about if the perception of flood risk of the respondents has changed or not, we can see the following. There is also a reasonable coherence between these two variables. Because the value of Cramer's V is bigger than 0,2, but smaller than 0,5. This means that the change in awareness of flood risk also gives a change in flood risk perception. The variable on whether the preparedness of flood risk of the respondents have changed or not with the variable about if the perception of flood risk of the respondents has changed or not, has a poor coherence. Because the value of Cramer's V is smaller than 0,2.

When we look at the coherence between the three features, we see that all tests show us a value of Cramer's V that is bigger than 0,2. This means there is a coherence between the three of them. So, preparedness may have no direct coherence with the change of perception, but it does influence worry and awareness.

Ranking perception flood risk before and after the flood

For the variables about how the respondents would rank their perception of flood risk before and after the floods in Arcen July 2021, a coherence was found (see output SPSS part VIII). The P-value is smaller than 0,05 and in the bar charts, we can see a significant difference between what respondents chose when it came down to how they would rank their flood risk perception. After the flood, the respondents chose a higher value for their perception of flood risk, which means the perception of flood risk changed and got higher ranked among the respondents. So, the respondents felt that their perception of flood risk changed and the risk itself of floods in the area where they live got worse.

Change flood risk perception and other variables

So, there was a coherence found between the variable about whether respondents learnt from the flood experience (question eighteen) and the variable if their flood risk perception has changed. The P-value is smaller than 0,05 (see output SPSS part VIII). When we look at the bar charts, we see something remarkable. The respondents feel more prepared for future floods, so have learnt from the experience, but it did not change their perception of flood risk.

When we look at the output (see output SPSS part VIII) of the tests between the variables about the expectations about floods and government and the variable whether the perception of flood risk changed for the respondents, we can see that there is a poor coherence. Because the value of Cramer's V is smaller than 0,2.

Change flood risk perception and respondent profile

At last the coherence between the respondent's profile (questions two to four) and the variable about whether the flood risk perception was tested (see output SPSS part IX). With the chi-square test between gender and if the perception of flood risk has changed is a poor coherence found. Because the value of Cramer's V is smaller than 0,2. Approximately half of women and half of men who filled in the survey, also filled in that their perception of flood risk changed.

For the other two variables about the respondent profile, Kruskal Wallis tests were performed. Between the education of the respondents and if their perception of flood risk changed, there was no coherence found. The P-value is bigger than 0,05. But there was a coherence found between the age of the respondents and whether the flood risk perception of respondents has changed or not. Because the P-value is smaller than 0,05. When we look at the bar charts, we can see that most respondents who filled in that their perception of flood risk did not change, were between the age of 25-79. This means that the respondents younger than twenty-five rarely filled in that their perception did not change.

V.I Discussion of conclusions

So, when we look at all the results of the data analysis the following was found. Whether the perception of flood risk of the inhabitants of Arcen after the flood in July 2021 changed or not is quite even. After the flood, the inhabitants chose a higher value for their perception of flood risk, which means the perception of flood risk changed and got higher ranked by the inhabitants of Arcen. So, it is safe to say that the perception of flood risk not only changed but increased as well for the inhabitants of Arcen after the flood in July 2021. Therefore, the risk of a flood occurring in the area where they live got bigger in the eyes of the inhabitants of Arcen. There is no difference in gender here. But the inhabitants younger than twenty-five rarely felt that their perception did not change. So, age did influence whether their flood risk perception did change or not.

VI.I Which factors affect the perception of people of flood risk?

The features that affect the perception of the inhabitants of Arcen of flood risk the most are worry and awareness. Those features are mostly influenced by the cognitive elements experience and feelings and the situational element intensity of the flood.

When we look at the situational elements that influenced the change of flood risk perception of the inhabitants of Arcen the following is found. The features: worry and awareness influenced the rate of intensity of the flood that the inhabitants filled in. With the feature preparedness, the rate of intensity did not influence the feature. The situational elements about the location from the dike where the inhabitants of Arcen live and effects like the damage it had on their property, did not influence the three features: worry, awareness and preparedness.

When it comes down to the cognitive elements that influenced the change of flood risk perception of the inhabitants of Arcen the following is found. We can see that no inhabitants of Arcen chose the option that they felt no fear and then chose that their worry or awareness had changed. This proves that all the inhabitants of Arcen that felt no fear (or anything else) did not change their worry or awareness. Because it would be divergent if inhabitants felt no fear or anything else during the flood and still changed their worry or awareness. Because then the element; experience would not have been connected to the change of worry and awareness. But what is quite remarkable to see is that inhabitants that felt no fear (or anything else) did change their preparedness. So, people who did not feel fear still changed their preparedness for future floods. They know now what to do, but do not feel anything towards it. The measure of how much these variables influenced any of the three features worry, awareness or preparedness, was small though. The actions of the inhabitants did not influence them either. But when it comes down to how the inhabitants experienced the flood in Arcen in July 2021, this did influence whether their worry changed. When inhabitants of Arcen chose a higher value of experience, which means they were more scared or shocked by the flood, they also chose more often that their worry changed. Also, when it comes down to the feelings of the inhabitants, being threatened by floods only influenced the feature worry.

Most of the inhabitants of Arcen are more worried about flood risk after the flood in Arcen in July 2021. They also feel more aware of the flood risk after the flood in Arcen. Only half of the inhabitants of Arcen think they are more prepared for future floods. When it comes down to whether these three features influenced the change of perception, not all three seem to do. The feature worry did have an influence, but the feature preparedness did not. The increase of worry of flood risk of the inhabitants of Arcen does influence the change of perception. The increase of awareness of flood risk of the inhabitants of Arcen influences the change of perception as well, but a bit less. But when it comes down to the increase in preparedness it does not have a strong influence on the change of perception. So, the features worry and awareness had their influence on the change in flood risk perception, but the feature preparedness did not directly. But when we look at the influence among these three features: worry, awareness and preparedness; there is an influence between these three. So, preparedness did have an influence but not directly on the change of perception but through awareness and worry.

When we look at the analysis of the theory of the psychometric paradigm, the rate of how unknown and dreadful the risk is perceived both increased. So, these two overall factors also had their influence on the change of flood risk perception of the inhabitants of Arcen after the flood in July 2021.

VI.II Has the flooding event enhanced the awareness of climate change?

So, the perception of flood risk of the inhabitants of Arcen did change with half of the respondents. And because the increase in flood risk is a part of climate change, we could say that half of the respondents also are more aware when it comes down to climate change. But we can discuss whether the inhabitants of Arcen believe and are aware that flood risk is part of climate change. If they do, then half of the inhabitants of Arcen became more aware of climate change because approximately half of the inhabitants changed their flood risk perception.

VI.III Have the inhabitants of Arcen taken measures?

So, only thirteen percent of the respondents have taken any measures against future flooding events. But still, the majority of the respondents think they are more prepared after the flooding event in Arcen than before for future floods. Inhabitants may have not taken any measures, but they know now what to do when a flood occurs, so in that case it is logical that they feel more prepared. So still almost half of the inhabitants of Arcen do not think their preparedness has improved after the flooding event in Arcen in July 2021. Which can explain the low rate of inhabitants taking any measures.

VI.IV Have they learned from the experience?

The majority of the inhabitants of Arcen felt that they learned from the experience of the flooding event in Arcen in July 2021. The awareness of climate change of the inhabitants of Arcen was also enhanced and the majority of the respondents think they are more prepared after the flooding event in Arcen than before for future floods. But this is debatable because the majority of the inhabitants of Arcen did not take any measures

against future floods and half of the respondents did not change their perception of flood risk. There is also no influence between whether inhabitants of Arcen learned from the flood and if their perception of flood risk has changed. This means that the people who learned from the experience did not necessarily also choose their perception of flood risk changed in the questionnaire survey. So, the question remains whether they really learned from the experience of the flood in Arcen July 2021 and not only think they did, besides the learning process of how to cope with acute floods. The inhabitants of Arcen might only think they have learned from the experience by for example changing their perception of flood risk. Or learning from an experience does not mean that you also have changed your perception of something.

VI.V What expectations do the inhabitants of Arcen have?

These expectations are about how people look toward future floods and government management. Most of the inhabitants of Arcen do think that floods will happen again. And they expect the government to take measures. The fact that inhabitants of Arcen expect future floods and the government to manage them more, does not influence their change of flood risk perception. You could say that they feel like the government will manage it properly in the future. Or at least they expect from the government that they do.

VI.VI Applying psychometric paradigm to flood risk perception

So, the rate of dread risk is characterized by worry (Kraus & Slovic, 1988) and the rate of how unknown a risk is, is about the awareness of the risk (Adelekan & Asiyanbi, 2015). And worry, awareness and preparedness all influence each other (Mitchell, 2003; Raaijmakers, Krywkow & van der Veen, 2008). So, we will measure worry, awareness and preparedness to measure how dreadful and unknown the risk of the flood was. This will give us an analysis and psychometric paradigm on how the perception of flood risk is perceived.

So, when it comes down to the results of the research about the flood in Arcen July 2021, the following findings about the features worry, awareness and preparedness are found. Most of the respondents felt that they are more worried. Following there is an influence found in SPSS between the change in worry for flood risk and a change in flood risk perception. Next, most of the respondents felt that their awareness increased. Following there is an influence found in SPSS between the change in awareness of flood risk and a change in flood risk perception. But when it comes down to preparedness, half of the respondents do not think their preparedness has improved. The variable on whether the preparedness of flood risk of the respondents has changed or not with the variable about if the perception of flood risk of the respondents has changed or not, has a poor influence. What is remarkable to see, is that the rate of whether their worry changed is highest and the rate on whether their preparedness changed is lowest. With the rate of whether the awareness changed in the middle.

When the preparedness of inhabitants increases, the rate of how worried and aware they are decreases (Mitchell, 2003; Raaijmakers, Krywkow & van der Veen, 2008). But since the preparedness of the respondents did not improve, the

rate of worry and awareness is not that much influenced by the preparedness of the people. So, for this analysis we only must look at how the worry and awareness of the respondents increased.

How dreadful the risk is for the respondents has to do with how worried they are about floods. Since the worry of the respondents increased, the position of the rate of how dreadful the risk is to the respondents, moves more to the high dread side. How unknown the risk is for the respondents has to do with how their awareness increased. Since the awareness of the respondents increased, the position of the rate of how unknown the risk is to the respondents, moves more to the known side. But because the increase in awareness of the respondents was smaller than the increase in worry, this arrow will be smaller.

So, in Figure III you will see the psychometric paradigm amended for the flood of Arcen in July 2021 and where the perception of flood risk of the inhabitants of Arcen should be in the paradigm. The orange arrow is the direction the perception of the flood risk in Arcen moved after the flood in July 2021. The black arrows are the change in the rate of how dreadful and unknown the flood risk in Arcen changed. The black arrow horizontal is the change in worry and whether the respondents think flood risk became more dreadful. The black vertical arrow is about the change in awareness of the respondents and whether the respondents now know more about the risk. There was some change but not that much, so this arrow is smaller in length.

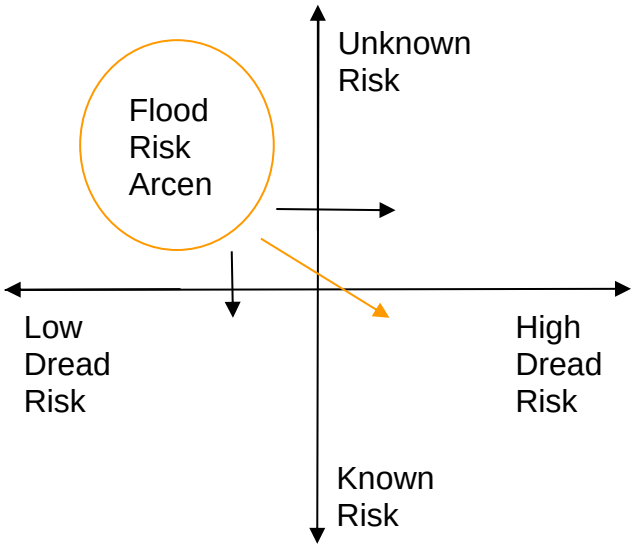


Figure III: Psychometric paradigm amended for the flood of Arcen July 2021

VI.VII Conceptual model amended for the flood in Arcen July 2021

So, when we look at all the influences between the variables, certain links can be made and others not. Therefore, we can create a conceptual model amended on how the perception of flood risk changed for the inhabitants of Arcen after the flood in July 2021. What we can see in this figure is the hypothesis described above. Almost exactly the

same as predicted in the conceptual model but missing the cognitive element actions and the situational elements, location from the dike and effects. These elements are missing here because there was no influence found between these elements in this particular research of the inhabitants of Arcen about the flood in July 2021. The conceptual model was amended to give a clearer overview of the elements, features and factors that influenced the inhabitants of Arcen during the flood in July 2021.

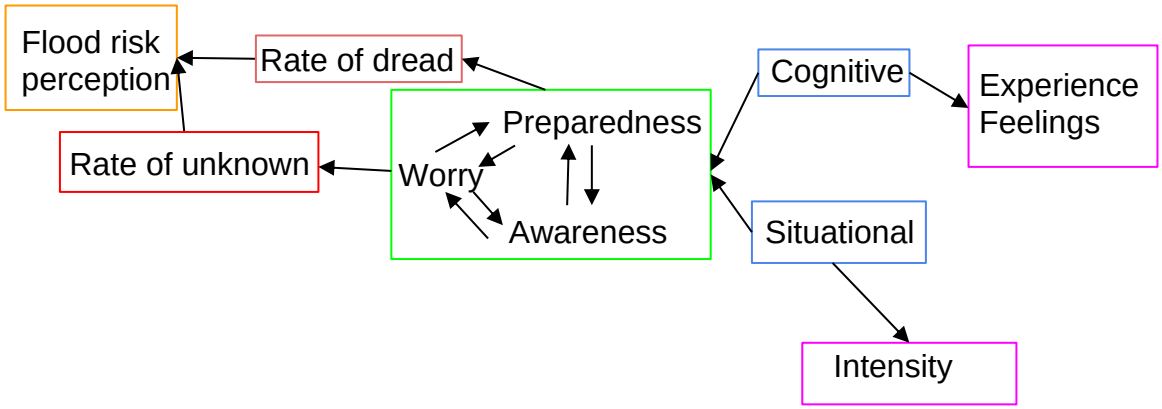


Figure IV: Conceptual model amended for flood Arcen July 2021

VII Conclusion

In this research the main goal was to answer the main research question *How has the flooding event in July 2021 in Arcen changed the perception of people of climate change*. To do this quantitative research was done through a survey filled in by the inhabitants of Arcen.

From the results, the following was found. The perception of flood risk of the inhabitants of Arcen did change after the flood in Arcen in July 2021. How the respondents perceive the flood risk in the area where they live, getting ranked higher. And because flood risk perception is a part of climate change perception, we can conclude that the flooding event in July 2021 in Arcen changed the perception of the inhabitants of climate change.

Cognitive elements like experience and feelings influenced the feature worry and the situational element intensity influenced the features worry and awareness. The three features; worry, awareness and preparedness influenced each other. And the feature worry influenced the rate of dread, and the feature awareness influenced the rate of unknown. All this influenced the change in flood risk perception.

Half of the respondents their perception of flood risk changed after the flooding event in Arcen in July 2021. The awareness of flood risk increased. So, because flood risk is part of climate change, the awareness of climate change increased as well as the flood risk awareness.

The inhabitants of Arcen feel like they are more prepared for future flooding events but did not take any measures. So, that means that the inhabitants learned from the flooding event in Arcen in July 2021 somehow because they now know what to do when a flood occurs. But they did not learn that much from the experience because they did not take any preparations. So, as far as preventing it from happening or trying to be more prepared by taking measures goes, they did not learn from the flooding event in Arcen in July 2021.

The inhabitants of Arcen expect that there will be more flooding events in the future and expect that the government will take more measures to prevent one or manage the flooding event in a good way.

So, when we look at all what factors, features and elements have changed and influenced each other, we can conclude which factors, features and elements played a part in the change of perception of the inhabitants of Arcen after the flood in July 2021. It is almost the same as what we expected in the hypothesis. But the element's location from the dike, effects and actions did not influence the change in flood risk perception. The perception of flood risk is influenced by the rate of how dreadful or unknown a risk is to people. Those factors are influenced by two of the three main features: awareness and worry. The third feature preparedness influences the other two features and so indirectly influences the rate of how dreadful and unknown a risk is. These three features are influenced by cognitive and situational elements. Cognitive elements about the experience and how they felt. And the situational element; the intensity of the flood that people pass through.

VII.I Critical reflections

The theory was very useful to analyze the results of the research. But also, to set up the conceptual model and think about how the data needed to be processed and which questions I needed to ask to get the right data. The theory especially had its most useful when I figured out how the factors rate of dread and unknown were influenced. Knowing this made it finally clear how I could conclude my results.

The theoretical framework gave me everything on how I should be doing my research, analyzing it and concluding it. Only one thing I think was missing, but maybe also would have been outside the framework for my research question. It is about whether the respondents have learned from the experience is not valid to answer. Because the definition of learning was not fully examined. But other than this the theoretical framework provided enough handles to do the research.

Core concepts from the problem statement like perception and risk perception were easy to explain in concept. Flood risk perception was a bit more difficult, so it took more time to find it in the right literature. Underlying sub-questions were after some literature reviews easy to explain and answer. But especially the part on what exactly were the two factors, rate of dread and unknown and how they were influenced, took me a little bit more time to understand and explain in my framework.

This amount of literature research was enough to do this research, I do not think that I had to do more of it. Because otherwise, I think I would have lost the main focus of the research.

To answer the problem statement and underlying sub-questions I used the right research method. Quantitative was a good way to research whether the perception had changed within a population after an event. Qualitative would have given a very biased outcome on which people I would have interviewed. Also, because I probably would have known them because I lived in Arcen as well and now everybody could fill in the survey anonymously. The literature research was helpful to set up my quantitative research.

The target audience I wanted to fill in the research was between 15 and 80+. I think that was achieved just fine. I expected a bigger group of respondents of my age, because I asked them personally via WhatsApp the most to fill in the survey. But most respondents were between 35 and 79. I think this is mostly because I put my request to fill in the survey on the Facebook page with only Arcen inhabitants. Most people in this Facebook group are between that age. A lot of people that I did not know well still responded that they filled in the survey, so I think the target audience was very cooperative.

Some respondents did not understand everything about the survey as they commended on the Facebook page that Arcen did not flood and the survey indicates it does. It was indeed unclear whether the river in Arcen flooded until the dike or behind it also. But as the survey was for only inhabitants of Arcen and everybody knew that the flood was stopped by the dike, it did not matter that the survey did not state that clearly. Also, only three people out of all the respondents commented on this. So, a lot of people understood the survey without any trouble. I considered that not many respondents would fill in my survey or would not understand it correctly. In the first case, I was thinking of finding other ways to ask people to fill in my survey and in the second matter, I think I would have needed to redo my survey. The last point I did not want to do because I was

afraid that fewer people would fill in my survey for the second time. So that is why I asked a test subject to fill in and analyze my survey at least ten times.

To increase the validity of this research I could have made clearer in my survey that Arcen did not flood further than the dike. Because this caused some confusion and different values among respondents. To be honest I was irritated by these people because they also filled in the survey with some blunt comments.

The results from this research gave sufficient insight to come up with relevant recommendations. The results clearly show what kind of factors, features and elements influence the flood risk perception of the inhabitants of Arcen. This can help with further research and praxis. But more about that later in the paragraph recommendations.

The hypothesis of my research was also the result I expected from this research. So, when we look at the conceptual model and the one amended about the flooding event in Arcen July 2021, the only difference is that two situational factors and one cognitive factor did not influence this specific case study. I do not think all the results are surprising. Arcen is small so I also thought that the location of the respondents their homes from the dike would not have made that kind of difference in their perception of flood risk. The effects the flood had on their property neither. This is because the flood only damaged the respondents' property who lived near the dike. But it was surprising that the actions that the respondents take, did not influence their perception of flood risk. Because I thought that people who for example helped build the dike and saw the dangers from up close, would have had more coherence with change in flood risk perception than people who stayed at home and did nothing.

To bring about the results in a good way, I used the theory and research method correctly. The theory and research method had to be understandable and clear, so they made it easy to understand my results and conclude them.

VII.II Recommendations

For further research, I would recommend focusing for example on why people think they learned from the experience but still did not change their perception of flood risk. There should be a focus on what learning from something exactly is. But also focus on the aspect that people can learn how to deal with a situation but still not learn enough from an experience to want to prevent it.

Further, I advise further research to focus on when people change their perception of flood risk, they also know flood risk is a consequence of climate change. To research this subject for more insight on this kind of information could lead to long-term solutions for flooding events. For example, what it will take for people to realize that the problem of flood risk lies with climate change. When they have more knowledge about the subject, they are maybe more willing to reduce climate change, for example to vote for a party that stands for that as well. Reducing climate change is a long-term solution to reduce flood risk.

Also, I recommend focusing on flood risk management in further research. What kind of management from the government but also the inhabitants did work to prevent the dike and town from flooding. This could give a great insight into how to manage a specific

area when there is a flood risk. So, researching this could lead to working praxis for the future. This could give good short-term solutions to flooding events.

For future praxis I recommend the government to take a more active role in flood risk management. The majority of the inhabitants of Arcen stated that they expect the government to deal with future flooding events. The inhabitants of Arcen also expect that there will be more floods in the future so in their eyes the need for good flood risk management is important.

Further, I recommend that the government works together with the inhabitants of a specific area to prepare for a future flood. For example, to write out a plan when there has to be an emergency dike again.

VIII Attachments

VIII.I Time plan

The time plan will be as follows.

Date	To do	Notes
25th March	Deadline Proposal 2nd opportunity	
Week 14	Processing feedback & interview guide setup	
Week 15	Interview guide	
Week 16	Spreading surveys	
Week 17	Collecting data	Processing surveys
Week 19 & 20	Processing data	SPSS
Week 21 & 22	Analyzing data	
Week 23	Concluding analysis	
10th June	Deadline Bachelor Thesis 1st opportunity	
Unknown - 24th June	Processing feedback	
24th June	Deadline Bachelor Thesis Final opportunity	

VIII.II Interview guide

Message send with survey
Lovely people,
I am researching the experience of inhabitants of Arcen during the flooding of the Maas last July. That is why I would like to ask the inhabitants of Arcen to fill in this questionnaire. The questionnaire is anonymous and will take a maximum of 5 minutes. I would also appreciate it if you could share the questionnaire with your family, acquaintances, neighbors and so on.

https://fmru.az1.qualtrics.com/jfe/form/SV_08LbB59mkM1QY3c

Dutch translation:

Lieve mensen,
Ik doe een onderzoek naar de ervaring van Arcenaren tijdens de overstromingen van de Maas vorig jaar juli. Daarom wil ik graag de inwoners van Arcen vragen om deze

vragenlijst in te vullen. De vragenlijst is anoniem en neemt maximaal 5 minuten in beslag. Ook zou ik het waarderen als u de vragenlijst zou kunnen delen met uw familie, kennissen, buren enzovoorts.

https://fmru.az1.qualtrics.com/jfe/form/SV_08LbB59mkM1QY3c

Questionnaire Bachelor Thesis

Introduction
My name is Eefje Janssen and I study at the Radboud University in Nijmegen. I made this questionnaire for my research about the flooding in Arcen last July. It is about whether and how the flooding has had an influence on how the inhabitants of Arcen now view climate change. There will be 20 questions about this. The questionnaire will be anonymous and will take a maximum of five minutes to complete.

Questions

(Respondents profile)

1. **Do you live in Arcen?**
   -Yes
   -No, then the survey ends here for you

2. **What is your age?**
   -15-24
   -25-34
   -35-49
   -50-79
   - 80+

3. **What is your gender?**
   -Male
   -Female
   -Other

4. **What is the highest level of education that you have completed or are working on?**
   -Secondary school
   -MBO
   -HBO
   -WO bachelor
   -WO master

(Situational elements)

5. **How far from the dike in Arcen do you live?**
   <100m from the dike (at Maasstraat)
   <250m from the dike (at Kerkstraat/Trip/Wal)
   <500m from the dike (at Boerenweg/Barones van Wijmarstraat)
   >500m from the dyke.

6. **Did you suffer from any physical damages to your property during the flooding events in Arcen in July 2021? More options are possible.**
   -No damage
   -Damage to my garden
   -Damage to my basement
   -Damage to my house

7. **There have been more frequent floods from the Maas in Arcen over the past years. How would you scale the magnitude of the flood in Arcen in July 2021?**
   -Small
   -Normal
   -Severe

(Cognitive elements)

8. **How did you feel during the flood in Arcen in July 2021?**
   1 I was not scared
   2 I was afraid of possible damages to the property of other community members
   3 I was afraid of possible damages to my property
   4 I was scared for the life of other community members
   5 I was scared for my life and/or the life or my family members
   6 Other

9. **Do you think that floods can be a real threat to your personal safety?**
   - Yes
   - No

10. **What did you do when it was announced to the residents of Arcen to evacuate? More options are possible.**
    -Evacuated
    -Helped build an emergency dike
    -Helped in a different way to make Arcen flood-proof
    -Stayed at home and put things up
    -Stayed at home
    - Other

11. **What did you think of the experience? More options are possible.**
    -I found the flood event normal

-I was nervous by the flood event
-I found the flood event intense
- I was scared by the flood event
- I was shocked by the flood event
- Other

(Worry, awareness and preparation)

12. **Are you more concerned about future flooding after the Arcen flood in 2021 than before?**
    -No
    -A little
    -Yes

13. **A flood risk is the probability of flooding of a certain area. Has your awareness about flood risk increased after the Arcen flood in 2021?**
    -No
    -A little
    -Yes

14. **Are you better prepared for future floods after the Arcen flood in 2021 than before?**
    -No
    -A little
    -Yes

(Perception of floods)

15. **How did you perceive the flood risk in the area where you live before the flood in Arcen in 2021?**
    - Null
    - Low
    - Medium
    - High
    - Very high

16. **Has your perception of flood risk changed after the flood in Arcen in 2021?**
    -Yes
    -No

17. **How do you perceive the flood risk in the area where you live after the flood in Arcen in 2021?**
    - Null
    - Low

- Medium
- High
- Very high

18. **What have you learned from the experience?**
    - Nothing
    - I am more aware of flood risks now
    - I am more aware of flood risks but I do not think it is necessary to take precautionary measures to protect myself and my property
    - I am more aware of flood risks, better prepared for future floods and I took precautionary measures to protect myself and my property
    - Other

19. **Do you expect the government/municipality to make preparations to prevent or better cope with future floods?**
    -Yes
    -No

20. **Do you expect there will be floods again in the near future?**
    -Yes
    -No

This was the end of the questionnaire. Thank you for your time.

Dutch translation:

Introductie

Mijn naam is Eefje Janssen en ik studeer aan de Radboud Universiteit in Nijmegen. Deze vragenlijst heb ik gemaakt voor mijn onderzoek naar de overstromingen in Arcen afgelopen juli. Het gaat over of en hoe de overstroming invloed heeft gehad op hoe de Arcenaren nu tegen klimaatverandering aankijken. Hierover zullen 20 vragen worden gesteld. De vragenlijst is anoniem en zal maximaal vijf minuten in beslag nemen.

Vragen

(Respondent profiel)

1. **Woont u in Arcen?**
   -Ja
   -Nee, dan eindigt de enquête hier voor jou

2. **Hoe oud bent u?**
   -15-24
   -25-34

-35-49
-50-79
- 80+

3. **Wat is uw geslacht?**
   -Man
   -Vrouw
   -Anders

4. **Wat is de hoogste opleiding die u heeft afgerond of mee bezig bent?**
   -Middelbare school
   -MBO
   -HBO
   -WO bachelor
   -WO master

(Situationele elementen)

5. **Hoe ver van de dijk in Arcen woont u?**
   <100m van de dijk (bij Maasstraat)
   <250m van de dijk (bij Kerkstraat/Trip/Wal)
   <500m van de dijk (bij Boerenweg/Barones van Wijmarstraat)
   >500m van de dijk.

6. **Heeft u tijdens de overstroming in Arcen in juli 2021 fysieke schade aan uw eigendommen opgelopen? Er zijn meerdere opties mogelijk.**
   -Geen schade
   -Schade aan mijn tuin
   -Schade aan mijn kelder
   -Schade aan mijn huis

7. **In Arcen zijn de afgelopen jaren vaker overstromingen geweest vanuit de Maas. Hoe zou u de omvang van de overstroming in Arcen in juli 2021 schalen?**
   -Klein
   -Normaal
   -Ernstig

(Cognitieve elementen)

8. **Hoe voelde u zich tijdens de overstroming in Arcen in juli 2021?**
   1 Ik was niet bang
   2 Ik was bang voor mogelijke schade aan eigendommen van andere leden van de gemeenschap
   3 Ik was bang voor mogelijke schade aan mijn eigendom
   4 Ik was bang voor het leven van andere leden van de gemeenschap
   5 Ik was bang voor mijn leven en/of het leven van mijn familieleden

6 Anders

9. **Denkt u dat overstromingen een reële bedreiging kunnen vormen voor uw persoonlijke veiligheid?**
   -Ja
   -Nee

10. **Wat deed u toen aan de inwoners van Arcen werd aangekondigd dat ze moesten evacueren? Er zijn meerdere opties mogelijk.**
    -Geëvacueerd
    -Geholpen bij het bouwen van een nooddijk
    -Op een andere manier geholpen om Arcen overstromingsbestendig te maken
    -Thuis gebleven en zet dingen op
    -Thuis gebleven
    - Anders

11. **Hoe heeft u de overstroming ervaren? Er zijn meerdere opties mogelijk.**
    -Ik vond de overstroming normaal
    -Ik was zenuwachtig door de overstroming
    -Ik vond de overstroming intens
    -Ik was bang voor de overstroming
    -Ik was geschokt door de overstroming
    -Anders

(Zorgen maken, bewustzijn en voorbereiding)

12. **Maakt u zich meer zorgen over toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor?**
    -Nee
    -Een beetje
    -Ja

13. **Een overstromingsrisico is de kans op overstroming van een bepaald gebied. Is uw bewustzijn over overstromingsrisico's toegenomen na de overstroming in Arcen in 2021?**
    -Nee
    -Een beetje
    -Ja

14. **Bent u beter voorbereid op toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor?**
    -Nee
    -Enigszins
    -Ja

(Perceptie van overstromingen)

15. **Hoe interpreteerde u het overstromingsrisico in uw woongebied voor de overstroming in Arcen in 2021?**
    - Niet
    - Laag
    - Medium
    - Hoog
    - Heel hoog

16. **Is uw perceptie van overstromingsrisico veranderd na de overstroming in Arcen in 2021?**
    -Ja
    -Nee

17. **Hoe ziet u het overstromingsrisico in het gebied waar u woont na de overstroming in Arcen in 2021?**
    - Niet
    - Laag
    - Medium
    - Hoog
    - Heel hoog

18. **Wat heeft u geleerd van de ervaring?**
    -Niets
    -Ik ben me nu meer bewust van overstromingsrisico's
    -Ik ben me meer bewust van overstromingsrisico's, maar ik denk niet dat het nodig is om voorzorgsmaatregelen te nemen om mezelf en mijn eigendom te beschermen
    -Ik ben me meer bewust van overstromingsrisico's, ben beter voorbereid op toekomstige overstromingen en heb voorzorgsmaatregelen genomen om mezelf en mijn eigendommen te beschermen
    -Anders

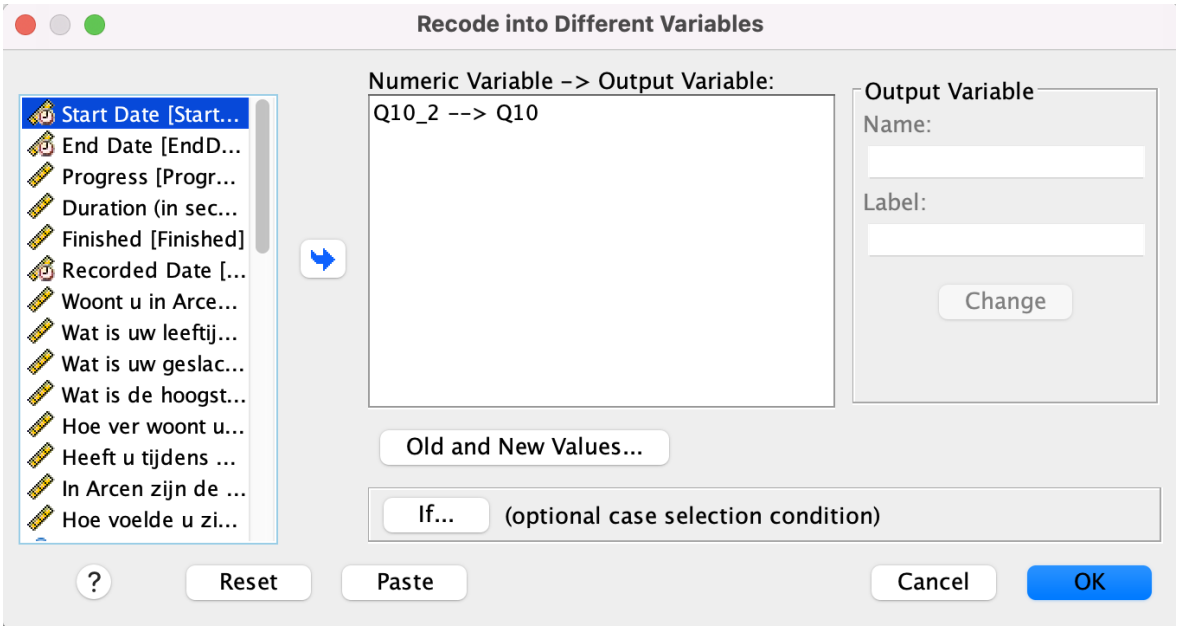
19. **Verwacht u dat de overheid/gemeente voorbereidingen treft om toekomstige overstromingen te voorkomen of beter op te vangen?**
    -Ja
    -Nee

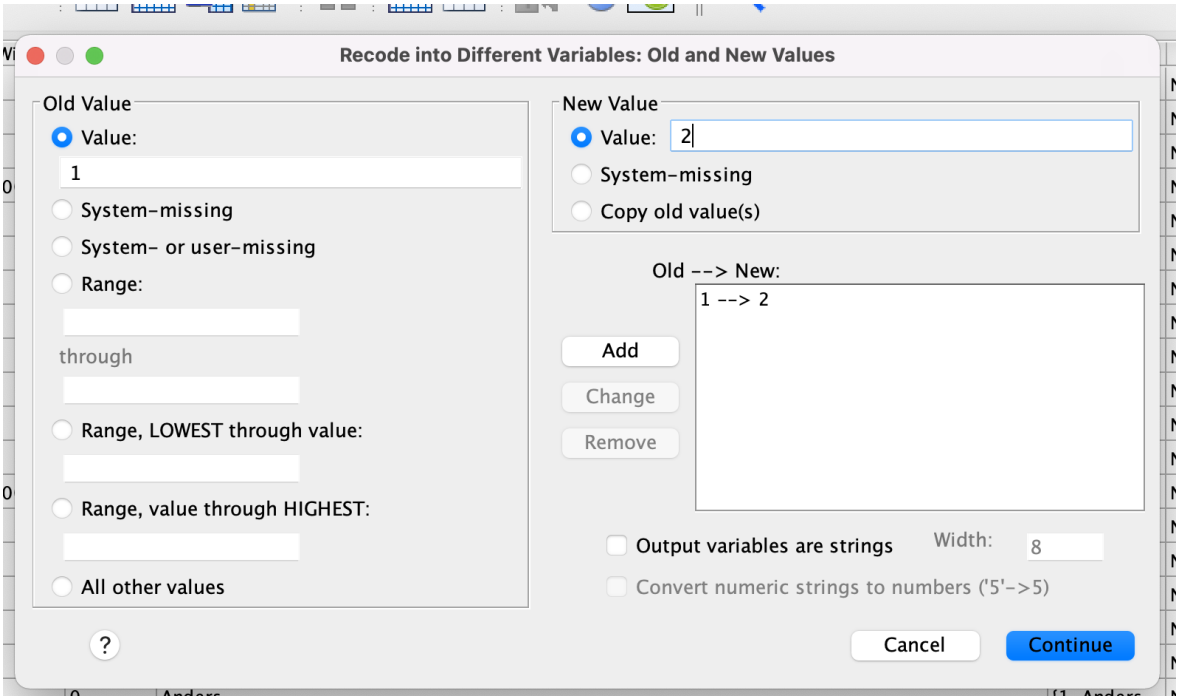
20. **Verwacht u dat er in de nabije toekomst weer overstromingen zullen zijn?**
    -Ja
    -Nee

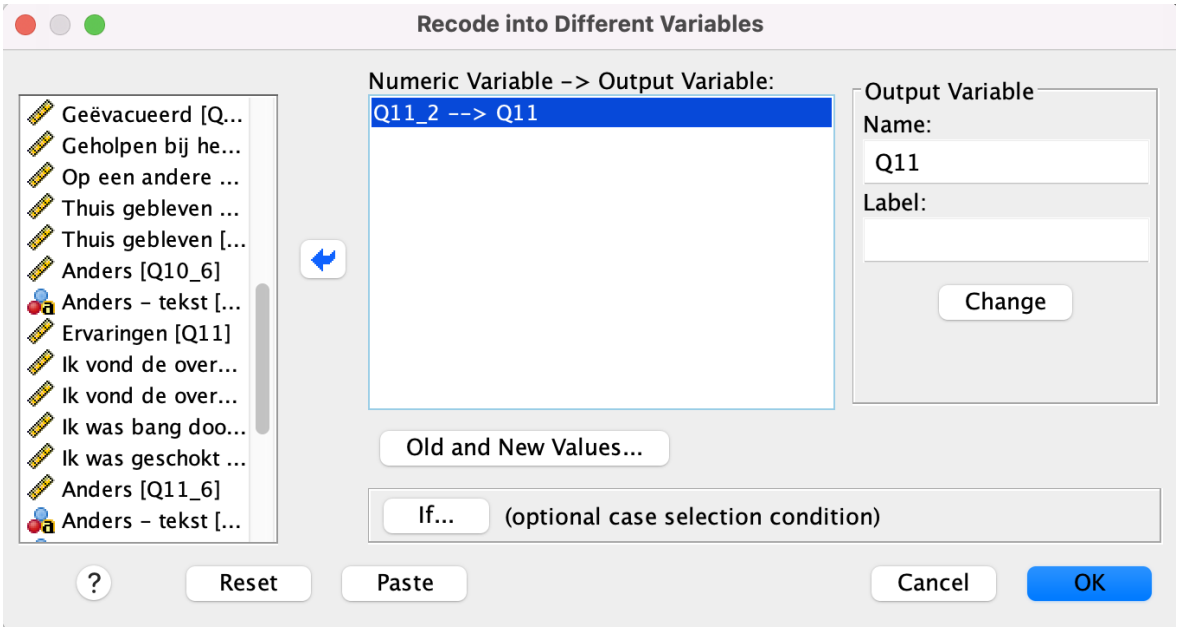
Dit was het einde van de vragenlijst. Bedankt voor uw tijd.

VIII.III SPSS-output

Part IA







Part IB

17	Q10_1	Numeric	40	0	Wat deed u toen aan de inwoners van Arcen werd aangekondigd dat ze moesten evacueren? Er zijn meerdere opties mogelijk. - Selected Choice
18	Q10_2	Numeric	40	0	Wat deed u toen aan de inwoners van Arcen werd aangekondigd dat ze moesten evacueren? Er zijn meerdere opties mogelijk. - Selected Choice
19	Q10_3	Numeric	40	0	Wat deed u toen aan de inwoners van Arcen werd aangekondigd dat ze moesten evacueren? Er zijn meerdere opties mogelijk. - Selected Choice
20	Q10_4	Numeric	40	0	Wat deed u toen aan de inwoners van Arcen werd aangekondigd dat ze moesten evacueren? Er zijn meerdere opties mogelijk. - Selected Choice
21	Q10_5	Numeric	40	0	Wat deed u toen aan de inwoners van Arcen werd aangekondigd dat ze moesten evacueren? Er zijn meerdere opties mogelijk. - Selected Choice
22	Q10_6	Numeric	40	0	Wat deed u toen aan de inwoners van Arcen werd aangekondigd dat ze moesten evacueren? Er zijn meerdere opties mogelijk. - Selected Choice
23	Q10_6_TEXT	String	2000	0	Wat deed u toen aan de inwoners van Arcen werd aangekondigd dat ze moesten evacueren? Er zijn meerdere opties mogelijk. - Anders - tekst
24	Q11_2	Numeric	40	0	Hoe heeft u de overstroming ervaren? Er zijn meerdere opties mogelijk. - Selected Choice Ik vond de overstroming normaal
25	Q11_7	Numeric	40	0	Hoe heeft u de overstroming ervaren? Er zijn meerdere opties mogelijk. - Selected Choice Ik was zenuwachtig door de overstroming
26	Q11_3	Numeric	40	0	Hoe heeft u de overstroming ervaren? Er zijn meerdere opties mogelijk. - Selected Choice Ik vond de overstroming heftig
27	Q11_4	Numeric	40	0	Hoe heeft u de overstroming ervaren? Er zijn meerdere opties mogelijk. - Selected Choice Ik was bang door de overstroming
28	Q11_5	Numeric	40	0	Hoe heeft u de overstroming ervaren? Er zijn meerdere opties mogelijk. - Selected Choice Ik was geschokt door de overstroming
29	Q11_6	Numeric	40	0	Hoe heeft u de overstroming ervaren? Er zijn meerdere opties mogelijk. - Selected Choice Anders
30	Q11_6_TEXT	String	2000	0	Hoe heeft u de overstroming ervaren? Er zijn meerdere opties mogelijk. - Anders - tekst

17	Q10_1	Numeric	40	0	Geëvacueerd
18	Q10_2	Numeric	40	0	Geholpen bij het bouwen van een nooddijk
19	Q10_3	Numeric	40	0	Op een andere manier geholpen om Arcen overstromingsbestendig te maken
20	Q10_4	Numeric	40	0	Thuis gebleven en spullen omhoog gezet
21	Q10_5	Numeric	40	0	Thuis gebleven
22	Q10_6	Numeric	40	0	Anders
23	Q10_6_TEXT	String	2000	0	Anders - tekst
24	Q11_1	Numeric	40	0	Ik vond de overstroming normaal
25	Q11_2	Numeric	40	0	Ik was zenuwachtig door de overstroming
26	Q11_3	Numeric	40	0	Ik vond de overstroming heftig
27	Q11_4	Numeric	40	0	Ik was bang door de overstroming
28	Q11_5	Numeric	40	0	Ik was geschokt door de overstroming
29	Q11_6	Numeric	40	0	Anders
30	Q11_6_TEXT	String	2000	0	Anders - tekst

Part II

Nonparametric Tests

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.[a,b]	Decision
1	The distribution of Hoe ver woont u van de dijk vandaan in Arcen? is the same across categories of Maakt u zich meer zorgen over toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor?.	Independent-Samples Kruskal-Wallis Test	.707	Retain the null hypothesis.
2	The distribution of Heeft u tijdens de overstroming in Arcen in juli 2021 fysieke schade aan uw eigendommen opgelopen? is the same across categories of Maakt u zich meer zorgen over toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor?.	Independent-Samples Kruskal-Wallis Test	.214	Retain the null hypothesis.
3	The distribution of In Arcen zijn de afgelopen jaren vaker overstromingen geweest vanuit de Maas. Hoe zou u de omvang van de overstroming in Arcen in juli 2021 schalen? is the same across categories of Maakt u zich meer zorgen over toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor?.	Independent-Samples Kruskal-Wallis Test	.015	Reject the null hypothesis.

a. The significance level is .050.

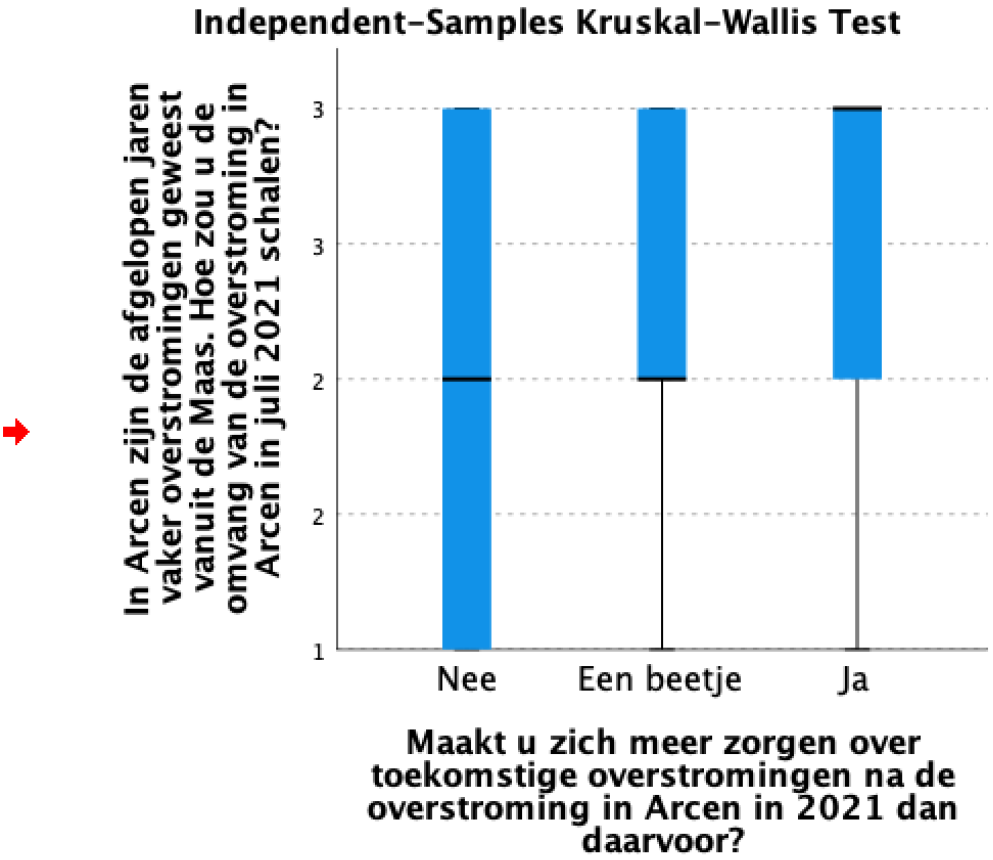
b. Asymptotic significance is displayed.

In Arcen zijn de afgelopen jaren vaker overstromingen geweest vanuit de Maas. Hoe zou u de omvang van de overstroming in Arcen in juli 2021 schalen? across Maakt u zich meer zorgen over toekomstige overstrominge n na de overstroming in Arcen in 2021 dan daarvoor?

Independent-Samples Kruskal-Wallis Test Summary

Total N	159
Test Statistic	8.369[a]
Degree Of Freedom	2
Asymptotic Sig.(2-sided test)	.015

a. The test statistic is adjusted for ties.



Pairwise Comparisons of Maakt u zich meer zorgen over toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor?

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.[a]
Nee-Een beetje	-11.168	9.558	-1.168	.243	.728
Nee-Ja	-27.278	10.137	-2.691	.007	.021
Een beetje-Ja	-16.110	7.498	-2.148	.032	.095

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.

Asymptotic significances (2-sided tests) are displayed. The significance level is .050.

a. Significance values have been adjusted by the Bonferroni correction for multiple

Part III

Nonparametric Tests

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.[a,b]	Decision
1	The distribution of Hoe ver woont u van de dijk vandaan in Arcen? is the same across categories of Een overstromingsrisico is de kans op overstroming van een bepaald gebied. Is uw bewustzijn over overstromingsrisico's toegenomen na de overstroming in Arcen in 2021?.	Independent-Samples Kruskal-Wallis Test	.403	Retain the null hypothesis.
2	The distribution of Heeft u tijdens de overstroming in Arcen in juli 2021 fysieke schade aan uw eigendommen opgelopen? is the same across categories of Een overstromingsrisico is de kans op overstroming van een bepaald gebied. Is uw bewustzijn over overstromingsrisico's toegenomen na de overstroming in Arcen in 2021?.	Independent-Samples Kruskal-Wallis Test	.340	Retain the null hypothesis.
3	The distribution of In Arcen zijn de afgelopen jaren vaker overstromingen geweest vanuit de Maas. Hoe zou u de omvang van de overstroming in Arcen in juli 2021 schalen? is the same across categories of Een overstromingsrisico is de kans op overstroming van een bepaald gebied. Is uw bewustzijn over overstromingsrisico's toegenomen na de overstroming in Arcen in 2021?.	Independent-Samples Kruskal-Wallis Test	.002	Reject the null hypothesis.

a. The significance level is .050.

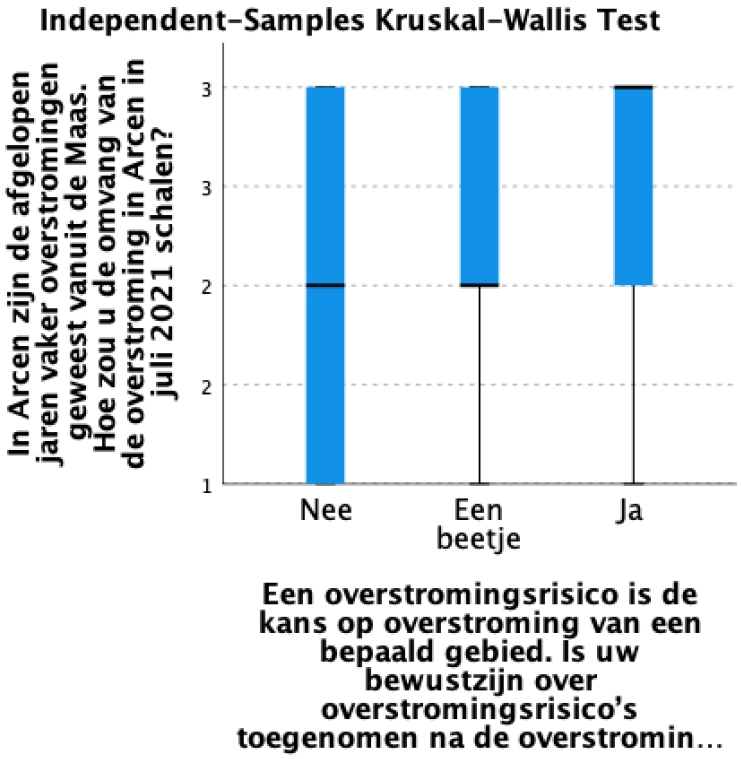
b. Asymptotic significance is displayed.

In Arcen zijn de afgelopen jaren vaker overstromingen geweest vanuit de Maas. Hoe zou u de omvang van de overstroming in Arcen in juli 2021 schalen? across Een overstromingsrisico is de kans op overstroming van e en bepaald gebied. Is uw bewustzijn over overstromingsrisico's toegenomen na de overstroming in Arcen in 2 021?

Independent-Samples Kruskal-Wallis Test Summary

Total N	159
Test Statistic	12.251[a]
Degree Of Freedom	2
Asymptotic Sig.(2-sided test)	.002

a. The test statistic is adjusted for ties.



Pairwise Comparisons of Een overstromingsrisico is de kans op overstroming van een bepaald gebied. Is uw bewustzijn over overstromingsrisico's toegenomen na de overstroming in Arcen in 2021?

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.[a]
Nee-Een beetje	-13.243	9.293	-1.425	.154	.462
Nee-Ja	-29.394	8.705	-3.377	<.001	.002
Een beetje-Ja	-16.151	7.727	-2.090	.037	.110

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .050.

Part IV

Nonparametric Tests

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.[a,b]	Decision
1	The distribution of Hoe ver woont u van de dijk vandaan in Arcen? is the same across categories of Bent u beter voorbereid op toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor?.	Independent-Samples Kruskal-Wallis Test	.547	Retain the null hypothesis.
2	The distribution of Heeft u tijdens de overstroming in Arcen in juli 2021 fysieke schade aan uw eigendommen opgelopen? is the same across categories of Bent u beter voorbereid op toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor?.	Independent-Samples Kruskal-Wallis Test	.245	Retain the null hypothesis.
3	The distribution of In Arcen zijn de afgelopen jaren vaker overstromingen geweest vanuit de Maas. Hoe zou u de omvang van de overstroming in Arcen in juli 2021 schalen? is the same across categories of Bent u beter voorbereid op toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor?.	Independent-Samples Kruskal-Wallis Test	.320	Retain the null hypothesis.

a. The significance level is .050.

b. Asymptotic significance is displayed.

Pairwise Comparisons of Bent u beter voorbereid op toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor?

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.[a]
Nee-Ja	-7.466	11.571	-.645	.519	1.000
Nee-Enigszins	-10.757	7.151	-1.504	.133	.398
Ja-Enigszins	3.290	11.320	.291	.771	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.

Asymptotic significances (2-sided tests) are displayed. The significance level is .050.

a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

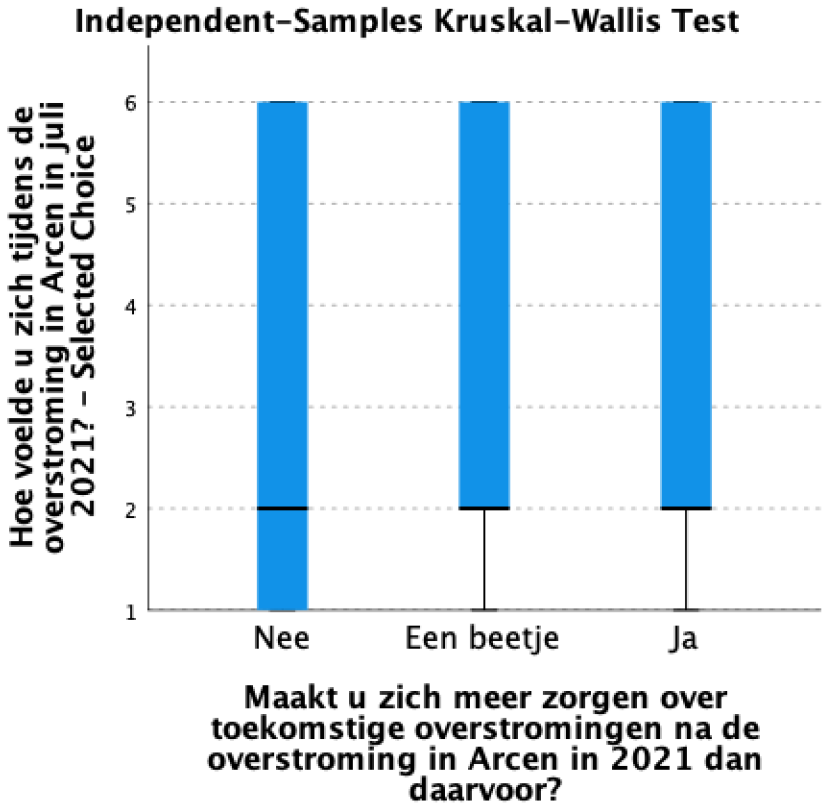
Part V

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.[a,b]	Decision
1	The distribution of Hoe voelde u zich tijdens de overstroming in Arcen in juli 2021? - Selected Choice is the same across categories of Maakt u zich meer zorgen over toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor?.	Independent-Samples Kruskal-Wallis Test	.436	Retain the null hypothesis.

a. The significance level is .050.

b. Asymptotic significance is displayed.

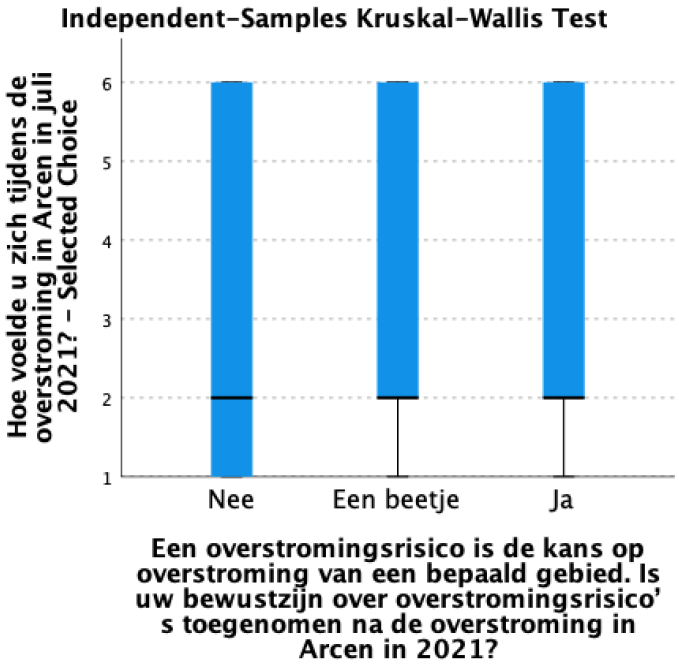


Hypothesis Test Summary

	Null Hypothesis	Test	Sig.[a,b]	Decision
1	The distribution of Hoe voelde u zich tijdens de overstroming in Arcen in juli 2021? - Selected Choice is the same across categories of Een overstromingsrisico is de kans op overstroming van een bepaald gebied. Is uw bewustzijn over overstromingsrisico's toegenomen na de overstroming in Arcen in 2021?.	Independent-Samples Kruskal-Wallis Test	.353	Retain the null hypothesis.

a. The significance level is .050.

b. Asymptotic significance is displayed.

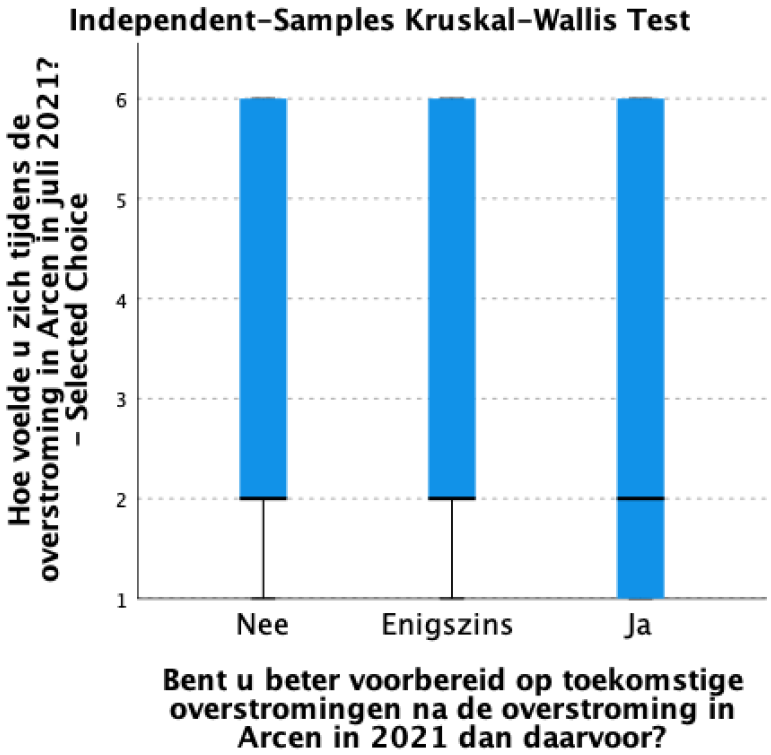


Hypothesis Test Summary

	Null Hypothesis	Test	Sig.[a,b]	Decision
1	The distribution of Hoe voelde u zich tijdens de overstroming in Arcen in juli 2021? - Selected Choice is the same across categories of Bent u beter voorbereid op toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor?.	Independent-Samples Kruskal-Wallis Test	.563	Retain the null hypothesis.

a. The significance level is .050.

b. Asymptotic significance is displayed.



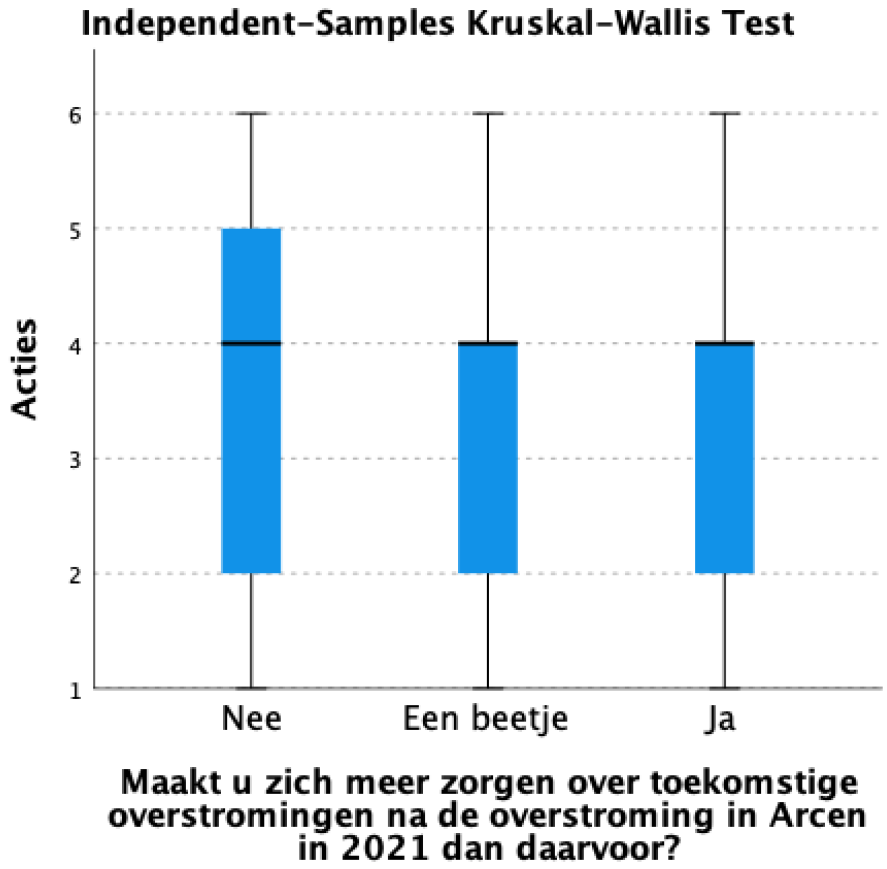
Nonparametric Tests

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.[a,b]	Decision
1	The distribution of Ervaringen is the same across categories of Maakt u zich meer zorgen over toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor?.	Independent-Samples Kruskal-Wallis Test	.003	Reject the null hypothesis.
2	The distribution of Acties is the same across categories of Maakt u zich meer zorgen over toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor?.	Independent-Samples Kruskal-Wallis Test	.264	Retain the null hypothesis.

a. The significance level is .050.

b. Asymptotic significance is displayed.



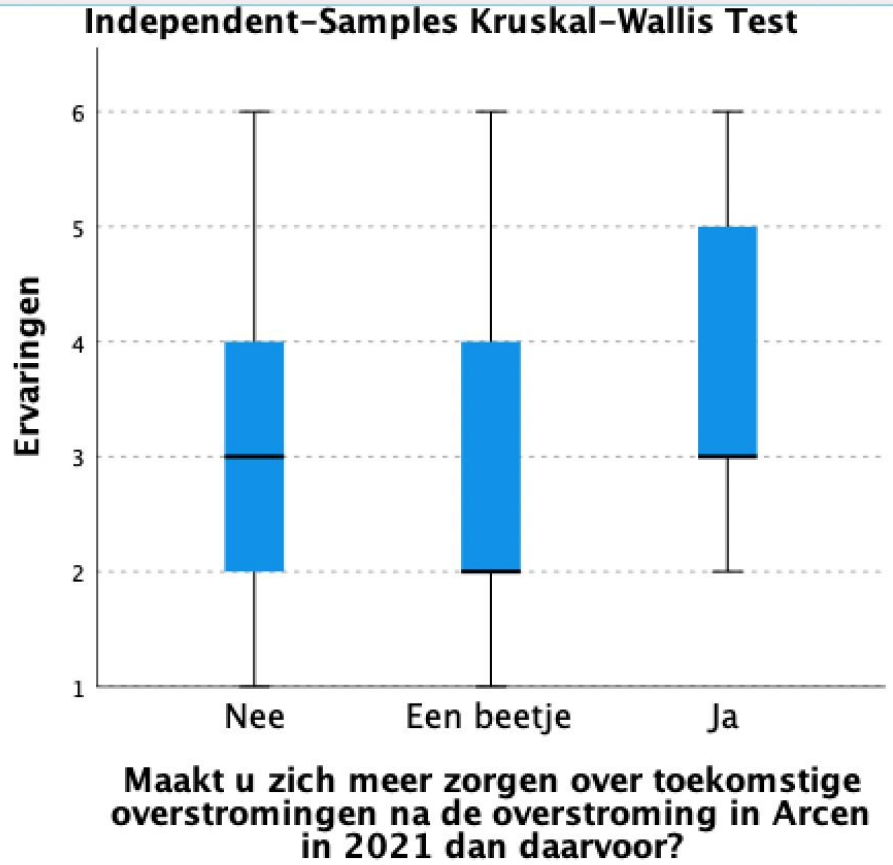
Pairwise Comparisons of Maakt u zich meer zorgen over toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor?

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.[a]
Een beetje-Ja	-.727	7.934	-.092	.927	1.000
Een beetje-Nee	15.946	10.113	1.577	.115	.344
Ja-Nee	15.219	10.726	1.419	.156	.468

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.

Asymptotic significances (2-sided tests) are displayed. The significance level is .050.

a. Significance values have been adjusted by the Bonferroni correction for multiple



Pairwise Comparisons of Maakt u zich meer zorgen over toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor?

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.[a]
Een beetje-Nee	3.410	10.144	.336	.737	1.000
Een beetje-Ja	-26.152	7.958	-3.286	.001	.003
Nee-Ja	-22.743	10.759	-2.114	.035	.104

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .050.

a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.[a,b]	Decision
1	The distribution of Ervaringen is the same across categories of Een overstromingsrisico is de kans op overstroming van een bepaald gebied. Is uw bewustzijn over overstromingsrisico's toegenomen na de overstroming in Arcen in 2021?.	Independent-Samples Kruskal-Wallis Test	.463	Retain the null hypothesis.
2	The distribution of Acties is the same across categories of Een overstromingsrisico is de kans op overstroming van een bepaald gebied. Is uw bewustzijn over overstromingsrisico's toegenomen na de overstroming in Arcen in 2021?.	Independent-Samples Kruskal-Wallis Test	.752	Retain the null hypothesis.

a. The significance level is .050.

b. Asymptotic significance is displayed.

Nonparametric Tests

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.[a,b]	Decision
1	The distribution of Ervaringen is the same across categories of Bent u beter voorbereid op toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor?.	Independent-Samples Kruskal-Wallis Test	.337	Retain the null hypothesis.
2	The distribution of Acties is the same across categories of Bent u beter voorbereid op toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor?.	Independent-Samples Kruskal-Wallis Test	.163	Retain the null hypothesis.

a. The significance level is .050.

b. Asymptotic significance is displayed.

Part VI

Denkt u dat overstromingen een reële bedreiging kunnen vormen voor uw persoonlijke veiligheid? * Maakt u zich meer zorgen over toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor?

Crosstab

Count

		Maakt u zich meer zorgen over toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor?			
		Nee	Een beetje	Ja	Total
Denkt u dat overstromingen een reële bedreiging kunnen vormen voor uw persoonlijke veiligheid?	Ja	6	33	36	75
	Nee	20	47	17	84
Total		26	80	53	159

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	16.343[a]	2	<.001
Likelihood Ratio	16.871	2	<.001
Linear-by-Linear Association	16.109	1	<.001
N of Valid Cases	159		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 12.26.

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.321	<.001
	Cramer's V	.321	<.001
N of Valid Cases		159	

Denkt u dat overstromingen een reële bedreiging kunnen vormen voor uw persoonlijke veiligheid? * Een over stromingsrisico is de kans op overstroming van een bepaald gebied. Is uw bewustzijn over overstromingsrisi co's toegenomen na de overstroming in Arcen in 2021?

Crosstab

Count

		Een overstromingsrisico is de kans op overstroming van een bepaald gebied. Is uw bewustzijn over overstromingsrisico's toegenomen na de overstroming in Arcen in 2021?			
		Nee	Een beetje	Ja	Total
Denkt u dat overstromingen een reële bedreiging kunnen vormen voor uw persoonlijke veiligheid?	Ja	10	26	39	75
	Nee	25	25	34	84
Total		35	51	73	159

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	6.301[a]	2	.043
Likelihood Ratio	6.494	2	.039
Linear-by-Linear Association	4.945	1	.026
N of Valid Cases	159		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 16.51.

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.199	.043
	Cramer's V	.199	.043
N of Valid Cases		159	

Denkt u dat overstromingen een reële bedreiging kunnen vormen voor uw persoonlijke veiligheid? * Bent u be ter voorbereid op toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor?

Crosstab

Count

		Bent u beter voorbereid op toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor?			
		Nee	Enigszins	Ja	Total
Denkt u dat overstromingen een reële bedreiging kunnen vormen voor uw persoonlijke veiligheid?	Ja	31	38	6	75
	Nee	32	41	11	84
Total		63	79	17	159

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1.094[a]	2	.579
Likelihood Ratio	1.113	2	.573
Linear-by-Linear Association	.652	1	.419
N of Valid Cases	159		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.02.

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.083	.579
	Cramer's V	.083	.579
N of Valid Cases		159	

Part VII

Maakt u zich meer zorgen over toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvo or? * Is uw perceptie van overstromingsrisico's veranderd na de overstromingen in Arcen in 2021?

Crosstab

Count

		Is uw perceptie van overstromingsrisico's veranderd na de overstromingen in Arcen in 2021?		
		Ja	Nee	Total
Maakt u zich meer zorgen over toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor?	Nee	7	18	25
	Een beetje	38	37	75
	Ja	32	18	50
Total		77	73	150

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	8.673[a]	2	.013
Likelihood Ratio	8.889	2	.012
Linear-by-Linear Association	7.258	1	.007
N of Valid Cases	150		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 12.17.

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.240	.013
	Cramer's V	.240	.013
N of Valid Cases		150	

Een overstromingsrisico is de kans op overstroming van een bepaald gebied. Is uw bewustzijn over overstrom ingsrisico's toegenomen na de overstroming in Arcen in 2021? * Is uw perceptie van overstromingsrisico's ver anderd na de overstromingen in Arcen in 2021?

Crosstab

Count

		Is uw perceptie van overstromingsrisico's veranderd na de overstromingen in Arcen in 2021?		
		Ja	Nee	Total
Een overstromingsrisico is de kans op overstroming van een bepaald gebied. Is uw bewustzijn over overstromingsrisico's toegenomen na de overstroming in Arcen in 2021?	Nee	6	27	33
	Een beetje	24	23	47
	Ja	47	23	70
Total		77	73	150

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	21.522[a]	2	<.001
Likelihood Ratio	22.767	2	<.001
Linear-by-Linear Association	20.513	1	<.001
N of Valid Cases	150		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 16.06.

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.379	<.001
	Cramer's V	.379	<.001
N of Valid Cases		150	

Bent u beter voorbereid op toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor? * Is uw perceptie van overstromingsrisico's veranderd na de overstromingen in Arcen in 2021?

Crosstab

Count

		Is uw perceptie van overstromingsrisico's veranderd na de overstromingen in Arcen in 2021?		
		Ja	Nee	Total
Bent u beter voorbereid op toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor?	Nee	28	34	62
	Enigszins	41	31	72
	Ja	8	8	16
Total		77	73	150

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1.864[a]	2	.394
Likelihood Ratio	1.868	2	.393
Linear-by-Linear Association	.813	1	.367
N of Valid Cases	150		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 7.79.

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.111	.394
	Cramer's V	.111	.394
N of Valid Cases		150	

Maakt u zich meer zorgen over toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor? * Een overstromingsrisico is de kans op overstroming van een bepaald gebied. Is uw bewustzijn over overstromingsrisico's toegenomen na de overstroming in Arcen in 2021? Crosstabulation

Count

		Een overstromingsrisico is de kans op overstroming van een bepaald gebied. Is uw bewustzijn over overstromingsrisico's toegenomen na de overstroming in Arcen in 2021?			
		Nee	Een beetje	Ja	Total
Maakt u zich meer zorgen over toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor?	Nee	18	2	6	26
	Een beetje	13	38	29	80
	Ja	4	11	38	53
Total		35	51	73	159

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	57.705[a]	4	<.001
Likelihood Ratio	51.264	4	<.001
Linear-by-Linear Association	29.938	1	<.001
N of Valid Cases	159		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.72.

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.602	<.001
	Cramer's V	.426	<.001
N of Valid Cases		159	

Maakt u zich meer zorgen over toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor? * Bent u beter voorbereid op toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor? Crosstabulation

Count

		Bent u beter voorbereid op toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor?			
		Nee	Enigszins	Ja	Total
Maakt u zich meer zorgen over toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor?	Nee	10	6	10	26
	Een beetje	27	48	5	80
	Ja	26	25	2	53
Total		63	79	17	159

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	29.983[a]	4	<.001
Likelihood Ratio	24.225	4	<.001
Linear-by-Linear Association	7.401	1	.007
N of Valid Cases	159		

a. 1 cells (11.1%) have expected count less than 5. The minimum expected count is 2.78.

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.434	<.001
	Cramer's V	.307	<.001
N of Valid Cases		159	

Een overstromingsrisico is de kans op overstroming van een bepaald gebied. Is uw bewustzijn over overstromingsrisico's toegenomen na de overstroming in Arcen in 2021? * Bent u beter voorbereid op toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor? Crosstabulation

Count

		Bent u beter voorbereid op toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor?			
		Nee	Enigszins	Ja	Total
Een overstromingsrisico is de kans op overstroming van een bepaald gebied. Is uw bewustzijn over overstromingsrisico's toegenomen na de overstroming in Arcen in 2021?	Nee	20	9	6	35
	Een beetje	22	26	3	51
	Ja	21	44	8	73
Total		63	79	17	159

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	13.224[a]	4	.010
Likelihood Ratio	13.896	4	.008
Linear-by-Linear Association	3.445	1	.063
N of Valid Cases	159		

a. 1 cells (11.1%) have expected count less than 5. The minimum expected count is 3.74.

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.288	.010
	Cramer's V	.204	.010
N of Valid Cases		159	

Part VIII

Nonparametric Tests

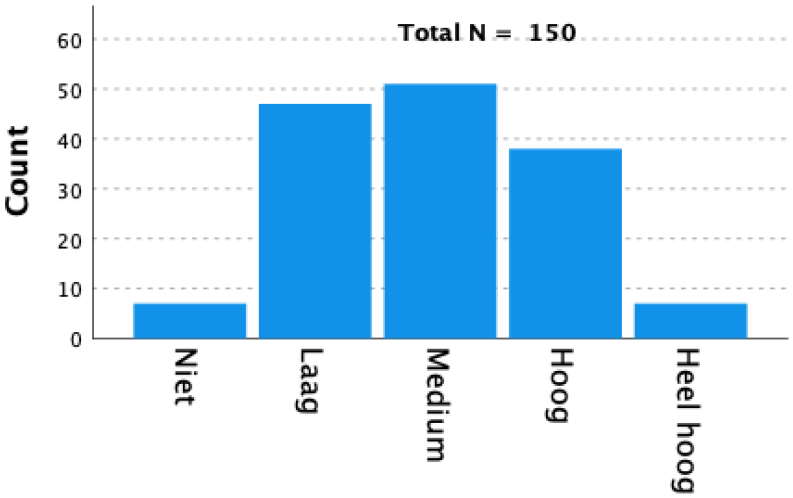
Hypothesis Test Summary

	Null Hypothesis	Test	Sig.[a,b]	Decision
1	The distribution of Hoe interpreteerde u het overstromingsrisico in uw woongebied vóór de overstroming in Arcen in 2021? is the same across categories of Hoe neemt u het overstromingsrisico waar in uw woongebied na de overstroming in Arcen in 2021?.	Independent-Samples Kruskal-Wallis Test	<.001	Reject the null hypothesis.

a. The significance level is .050.

b. Asymptotic significance is displayed.

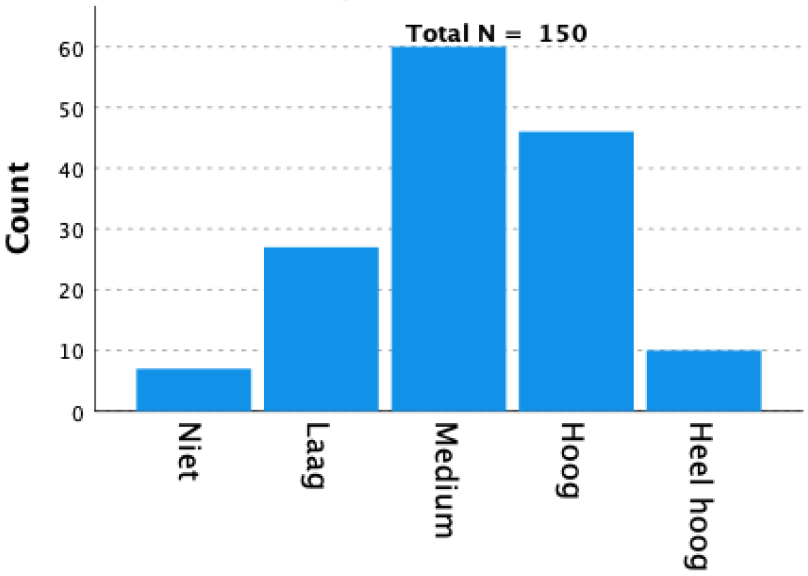
Categorical Field Information Hoe interpreteerde u het overstromingsrisico in uw woongebied vóór de overstroming in Arcen in 2021?



Hoe interpreteerde u het overstromingsrisico in uw woongebied vó...

Hoe interpreteerde u het overstromingsrisico in uw woongebied ɔór de overstroming in Arcen in 2021? field is ordinal but is treate as continuous in the test.

Categorical Field Information Hoe neemt u het overstromingsrisico waar in uw woongebied na de overstroming in Arcen in 2021?



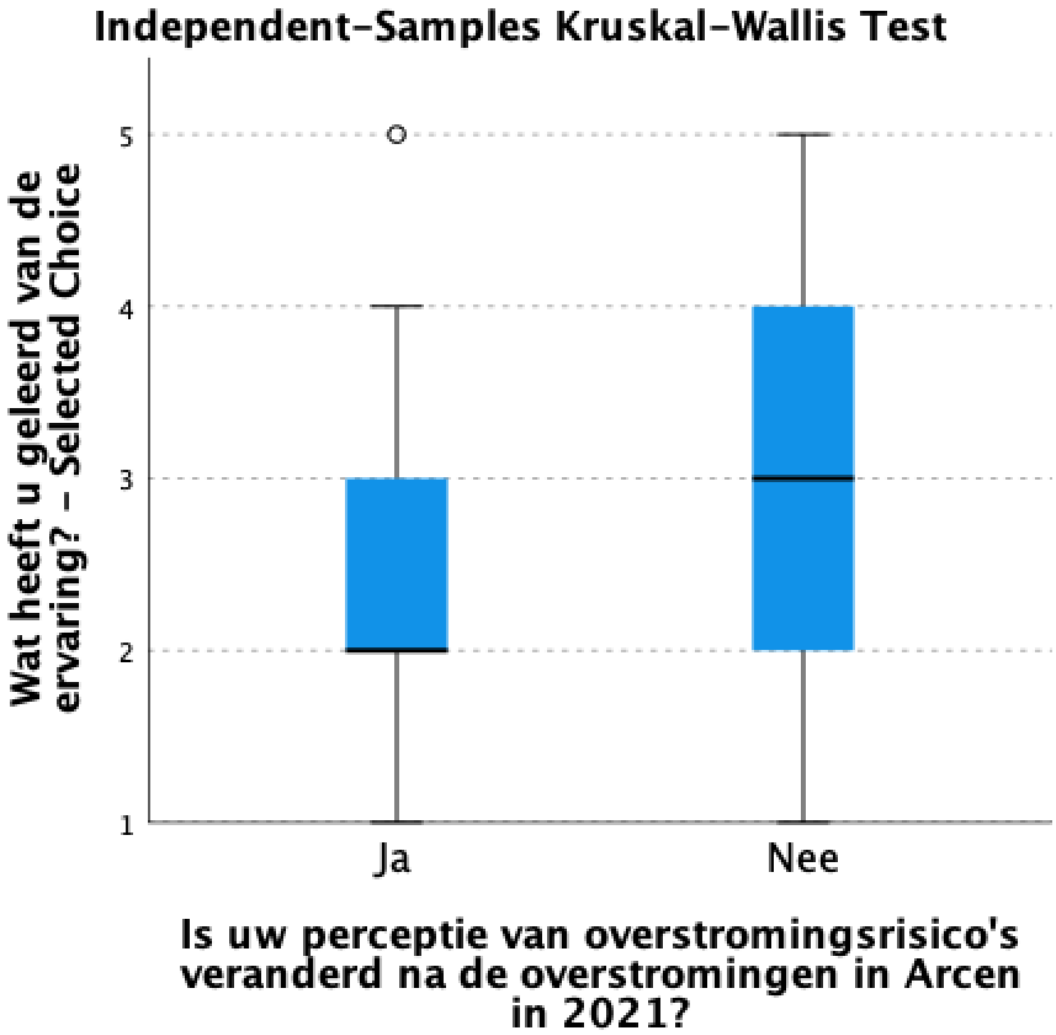
Hoe neemt u het overstromingsrisico waar in uw woongebied na de overstroming in Arcen in 2021?

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.[a,b]	Decision
1	The distribution of Wat heeft u geleerd van de ervaring? - Selected Choice is the same across categories of Is uw perceptie van overstromingsrisico's veranderd na de overstromingen in Arcen in 2021?.	Independent-Samples Kruskal-Wallis Test	.020	Reject the null hypothesis.

a. The significance level is .050.

b. Asymptotic significance is displayed.



Verwacht u dat de overheid/gemeente voorbereidingen treft om toekomstige overstromingen te voorkomen o f beter op te vangen? * Is uw perceptie van overstromingsrisico's veranderd na de overstromingen in Arcen in 2021?

Crosstab

Count

		Is uw perceptie van overstromingsrisico's veranderd na de overstromingen in Arcen in 2021?		
		Ja	Nee	Total
Verwacht u dat de overheid/gemeente voorbereidingen treft om toekomstige overstromingen te voorkomen of beter op te vangen?	Ja	64	52	116
	Nee	13	21	34
Total		77	73	150

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.019[a]	1	.082		
Continuity Correction[b]	2.379	1	.123		
Likelihood Ratio	3.037	1	.081		
Fisher's Exact Test				.118	.061
Linear-by-Linear Association	2.999	1	.083		
N of Valid Cases	150				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 16.55.

b. Computed only for a 2x2 table

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.142	.082
	Cramer's V	.142	.082
N of Valid Cases		150	

Verwacht u dat er in de nabije toekomst weer overstromingen zullen zijn? * Is uw perceptie van overstroming srisico's veranderd na de overstromingen in Arcen in 2021?

Crosstab

Count

		Is uw perceptie van overstromingsrisico's veranderd na de overstromingen in Arcen in 2021?		
		Ja	Nee	Total
Verwacht u dat er in de nabije toekomst weer overstromingen zullen zijn?	Ja	66	63	129
	Nee	11	10	21
Total		77	73	150

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.011[a]	1	.918		
Continuity Correction[b]	.000	1	1.000		
Likelihood Ratio	.011	1	.917		
Fisher's Exact Test				1.000	.553
Linear-by-Linear Association	.011	1	.918		
N of Valid Cases	150				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 10.22.

b. Computed only for a 2x2 table

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	-.008	.918
	Cramer's V	.008	.918
N of Valid Cases		150	

Part IX

Wat is uw geslacht? - Selected Choice * Is uw perceptie van overstromingsrisico's veranderd na de overstromingen in Arcen in 2021? Crosstabulation

Count

		Is uw perceptie van overstromingsrisico's veranderd na de overstromingen in Arcen in 2021?		
		Ja	Nee	Total
Wat is uw geslacht? - Selected Choice	Man	32	27	59
	Vrouw	45	46	91
Total		77	73	150

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.328[a]	1	.567		
Continuity Correction[b]	.165	1	.685		
Likelihood Ratio	.329	1	.567		
Fisher's Exact Test				.618	.343
Linear-by-Linear Association	.326	1	.568		
N of Valid Cases	150				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 28.71.

b. Computed only for a 2x2 table

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.047	.567
	Cramer's V	.047	.567
N of Valid Cases		150	

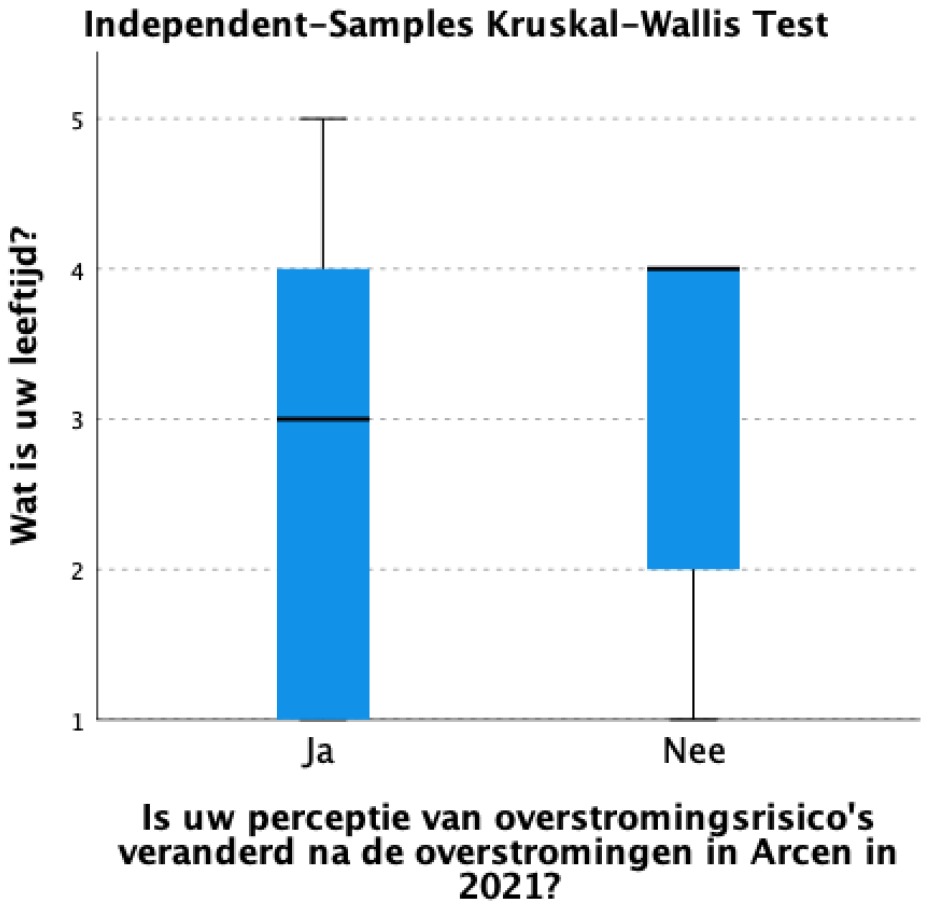
Nonparametric Tests

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.[a,b]	Decision
1	The distribution of Wat is uw leeftijd? is the same across categories of Is uw perceptie van overstromingsrisico's veranderd na de overstromingen in Arcen in 2021?.	Independent-Samples Kruskal-Wallis Test	.032	Reject the null hypothesis.
2	The distribution of Wat is de hoogste opleiding die u afgerond heeft of mee bezig bent? is the same across categories of Is uw perceptie van overstromingsrisico's veranderd na de overstromingen in Arcen in 2021?.	Independent-Samples Kruskal-Wallis Test	.809	Retain the null hypothesis.

a. The significance level is .050.

b. Asymptotic significance is displayed.



Part X

Maakt u zich meer zorgen over toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Nee	26	14.8	16.4	16.4
	Een beetje	80	45.5	50.3	66.7
	Ja	53	30.1	33.3	100.0
	Total	159	90.3	100.0	
Missing	System	17	9.7		
Total		176	100.0		

Een overstromingsrisico is de kans op overstroming van een bepaald gebied. Is uw bewustzijn over overstromingsrisico's toegenomen na de overstroming in Arcen in 2021?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Nee	35	19.9	22.0	22.0
	Een beetje	51	29.0	32.1	54.1
	Ja	73	41.5	45.9	100.0
	Total	159	90.3	100.0	
Missing	System	17	9.7		
Total		176	100.0		

Bent u beter voorbereid op toekomstige overstromingen na de overstroming in Arcen in 2021 dan daarvoor?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Nee	63	35.8	39.6	39.6
	Enigszins	79	44.9	49.7	89.3
	Ja	17	9.7	10.7	100.0
	Total	159	90.3	100.0	
Missing	System	17	9.7		
Total		176	100.0		

Verwacht u dat de overheid/gemeente voorbereidingen treft om toekomstige overstromingen te voorkomen of beter op te vangen?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Ja	116	65.9	77.3	77.3
	Nee	34	19.3	22.7	100.0
	Total	150	85.2	100.0	
Missing	System	26	14.8		
Total		176	100.0		

Verwacht u dat er in de nabije toekomst weer overstromingen zullen zijn?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Ja	129	73.3	86.0	86.0
	Nee	21	11.9	14.0	100.0
	Total	150	85.2	100.0	
Missing	System	26	14.8		
Total		176	100.0		

Is uw perceptie van overstromingsrisico's veranderd na de overstromingen in Arcen in 2021?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Ja	77	43.8	51.3	51.3
	Nee	73	41.5	48.7	100.0
	Total	150	85.2	100.0	
Missing	System	26	14.8		
Total		176	100.0		

Wat heeft u geleerd van de ervaring? - Selected Choice

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Niets	9	5.1	6.0	6.0
	Ik ben me nu meer bewust van overstromingsrisico's	67	38.1	44.7	50.7
	Ik ben me meer bewust van overstromingsrisico's, maar ik denk niet dat het nodig is om voorzorgsmaatregelen te nemen om mezelf en mijn eigendommen te beschermen	41	23.3	27.3	78.0
	Ik ben me meer bewust van overstromingsrisico's, ik ben beter voorbereid op toekomstige overstromingen en heb voorzorgsmaatregelen genomen om mezelf en mijn eigendommen te beschermen	20	11.4	13.3	91.3
	Anders	13	7.4	8.7	100.0
	Total	150	85.2	100.0	
Missing	System	26	14.8		
Total		176	100.0		

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