

The Longitudinal Dams: Exploring place attachment and Visions of Nature of recreationists along the Waal



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Abstract

As a possible next step in ensuring the safety and sustainability of the Dutch river landscape, Rijkswaterstaat has initiated a pilot project called 'longitudinal dams Waal'. These longitudinal dams are currently replacing some of the groynes in the Waal between the villages of Wamel and Ophemert, and are projected to combat dangerously high and low water levels, aid nature development, and provide a safer place to recreate.

However, the fishermen and boaters along the Waal also face possible threats to their recreational activities. Groyne removal reduces opportunities for fishing, and the impacts on nature and flood safety are not uncontested. On a more emotional level, however, previous research indicates that human intervention in natural and restorative places can engender strong resistance.

This thesis explores the emotional attachments of fishermen and boaters to nature in general, and to this trajectory of the Waal specifically. On the one hand, we make use of the concept of place attachment to investigate the bond these recreationists have with the area, such as their social attachments and their dependency on the area. On the other hand, we employ the theory of Visions of Nature to explore their lay philosophy of nature. This includes their valuation of nature, their images of nature, and their reflections on the human-nature relationship.

We make use of a mixed methods design. We use quantitative data from a small-scale survey (N = 75) to run several factor analyses, and to explore relationships using contingency tables. We also conducted 8 in-depth interviews in order to provide further depth and understanding to our quantitative findings. In a separate chapter we reflect on the ontological and epistemological positioning of a mixed methods researcher.

Our analysis of Visions of Nature indicates that our respondents greatly value nature, while making a clear distinction between wild and functional natures, with a third image deviating from our own model. Concerning the human-nature relationship, respondents most strongly adhere to a Guardianship image, combining the traditional Steward with the Participant. This Guardian is argued to be different from the one found in earlier studies.

Concerning place attachment, respondents recognise some of the traditional dimensions of attachment to places, but also a different form of attachment that we refer to as belongingness. We also find that the fishermen in our sample are significantly more attached to the area than the boaters.

Respondents' evaluations of the intended measures are largely negative, with boaters being more optimistic than fishermen. Contingency tables reveal that especially Images of Nature, recreation role and trust in Rijkswaterstaat influence respondents' evaluation of the intended measures.

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Chapter 1: Introduction

1.1: General Introduction

The general locus of this study is ‘het Rivierengebied’ (*the River Area*), located in the centre of the Netherlands where the basins of the river Meuse, as well as the river Rhine and its branch the Waal, are found (Figure 1.1). Like many water systems the River Area faces issues such as maintaining flood safety and ecological quality, combating subsidence, and dealing with the projected increases in river runoff as a result of global climate change (Eerden, 2014).

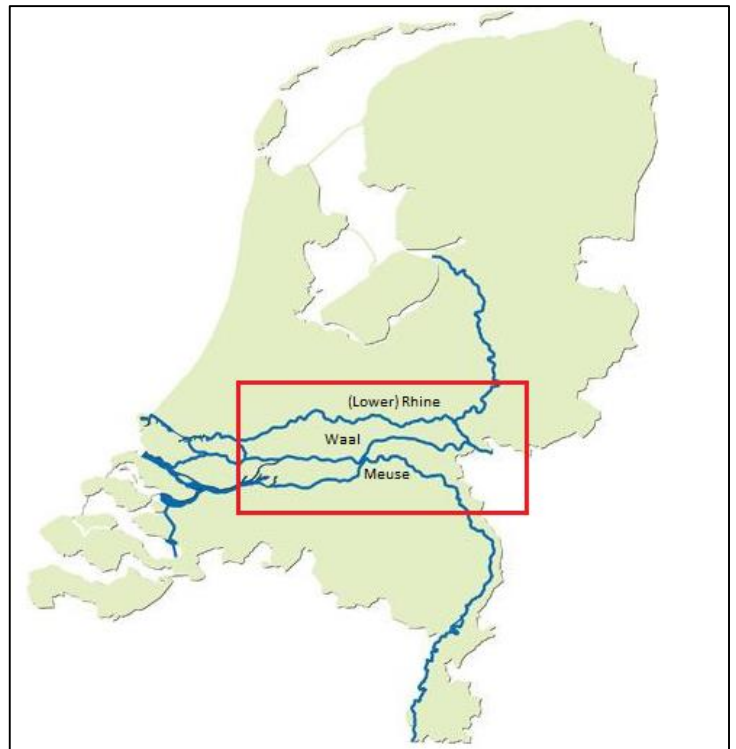


Figure 1.1: Location of the River Area in the Netherlands (Adapted from Rijksoverheid, n.d.)

Zooming in on the Waal river, several programmes, studies and visions regarding the sustainable development of the Waal have been developed or initiated. For instance, the *Handreiking Ruimtelijke Kwaliteit voor de Waal* (*Guide Spatial Quality for the Waal*) emphasises the importance of nature, culture, functionality and perceptions of the river for achieving sustainable development (Terra Incognita, Strooming, SAB, & Alterra, 2009). An example of a measure employed along the Waal is lowering of the groynes, part of the Room for the River programme; this procedure is visualised in Figure 1.2. These measures are carried out by Rijkswaterstaat, the Dutch Directorate for Public Works and Water.

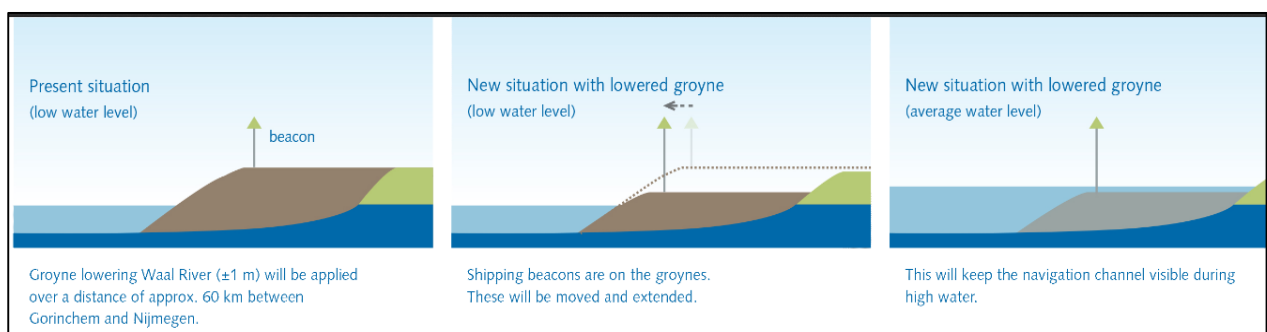


Figure 1.2: Groyne lowering (Room for the River, 2012)

The specific locus of this study, however, is the area between the villages of Ophemert and Wamel in the province of Gelderland. On this trajectory longitudinal dams will be placed in the river “parallel to the flow direction” (Room for the River, 2012). Between the villages of Wamel and

Ophemert the groynes in the outer river bend will be maintained, while those in the inner bend will be fully removed rather than lowered, and will be replaced with the aforementioned longitudinal dams (Figure 1.3). In doing so, the dams will split the river into a larger main channel with a width of around 230 meters, and a smaller side channel with a width of around 100 meters (Rijkswaterstaat, n.d.). These longitudinal dams, which have not yet been tested in the Netherlands, are intended as a pilot project. If successful, the procedure could be employed in other rivers in the Netherlands.



Figure 1.3: Map of the project location and the intended measures. Note that the groynes in the outer river bend will remain, while the longitudinal dams are placed along the inner bend (Rijkswaterstaat, 2012)

The longitudinal dams are intended to combat several of the issues mentioned at the start of this chapter. They are a measure against flood risk for instance, and as such are projected to reduce water levels during times of high water. Specifically, in the project area the water level is expected to drop between 6 and 12 centimetres in times of “extremely high tide” (Room for the River, 2012). By regulating the flow of water between the main and secondary channels, the dams are projected to reduce the risk of flooding during high tide, as well the risk of dangerously low water levels during droughts. In addition, it is expected that the dams will be beneficial to shipping due to the creation of two separate channels to split professional and recreational ships. This separation of professional and recreational ships is also expected to aid nature development: the side channel will be protected from the large waves created by professional ships, which is projected to lead to the development of

new habitats in the side channel. Design efforts have also been made to reduce the dams' impact on the aesthetic quality of the river landscape (Rijkswaterstaat, 2012).

However, although the project measures in this area are expected to be beneficial both now and in the future, some negative consequences can also be expected. For instance, two main groups of recreationists make use of the Waal area: fishermen, who often make use of the groynes to fish from, and boaters who travel along the river for leisure and relaxation. One could think of several reasons why the intended measures might carry negative consequences for these groups. For instance, in the new situation the groynes along the inner bend of the river will have been removed, and as such will no longer be accessible to fishermen: they will thus have to relocate. In addition, the groynes have become a characteristic element of the landscape which will be lost due to their removal.

In addition to the removed groynes, the placement of the longitudinal dams in the river also has consequences for recreationists. The dams could be beneficial to the boaters, as a main and secondary channel will be created within the river, which will allow boaters to avoid the professional shipping industry. As mentioned before the secondary channel is also expected to be an area of high ecological value, which could increase the aesthetic quality of the landscape. On the other hand, the dams will create a barrier in the river, which could negatively influence this very same aesthetic quality. This concern could be shared by the fishermen as well, since especially fishermen fishing on the inner bend of the river will be fairly close to the dams. In addition, the measures could harm the fish populations the fishermen depend on, especially since several species use the area between the groynes for spawning.

Aware that the proposed measures could have significant impacts on the landscape and the enjoyment thereof, Rijkswaterstaat is interested in the stakeholder perceptions of the river landscape. A monitoring programme for the pilot project longitudinal dams has been set up in order to monitor several project elements such as impacts on water levels and ecological quality. This research project, however, will contribute to data on stakeholder perceptions (Figure 1.4). This study was carried out before the project measures were realised, and as such produces baseline data. These data can be used as a point of reference further down the line to assess whether the project measures had any consequences, positive or negative, for the stakeholder perceptions and enjoyment of the landscape.

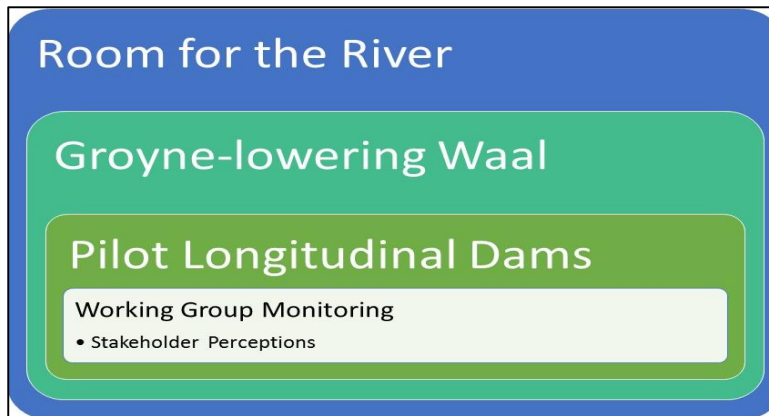


Figure 1.4: Position of this study in the overarching project. Longitudinal Dams Waal is an independent pilot project, but is carried out in the context of the larger Groyne-lowering Waal project within the Room for the River programme

This research project will focus on two groups of recreationists along the Waal: boaters and fishermen. As discussed in the next chapter, one of the theoretical foundations of this study is the concept of place attachment, which looks at bonds developed between people and places. What makes recreationists interesting from a place attachment perspective is that, more so than residents who happen to live nearby, recreationists seek out a specific place for their recreation goals. As such, it could be hypothesised that their attachment to the specific recreation area will be comparatively high. On the other hand, since it is easier to change recreation locations than place of residency one could also hypothesise that recreationists are less attached to one specific place. Finally, recreating in a natural area could be seen as a functional way of ‘using’ nature, but also as a form of appreciating nature’s intrinsic worth; this balance between instrumental and intrinsic nature values is interesting from the perspective of Visions of Nature, the second strand of theory employed in this study.

1.2: Practical and Theoretical Relevance

This research project aims to provide Rijkswaterstaat with requested information on the landscape perceptions of recreationists along the Waal river. As such, the research is given practical relevance by contributing to a practical knowledge gap of Rijkswaterstaat. This information will be approached using the theoretical concepts of the place attachment literature, which provide insight into several different dimensions of a person’s attachment to a specific location. Along with the place attachment approach, the recreationists’ more abstract lay philosophies of nature will be investigated using the theory of Visions of Nature. Studies such as Gobster (2001) and De Groot, Winnubst, Van Schie, and Van Ast (2013) illustrate how attention to local values and visions can contribute to more consensual planning decisions. While the decisions in this pilot project have already been taken, gaining insight into the local perceptions of the intended measures will still provide Rijkswaterstaat with useful information on their possible impact, which can be taken along when deciding whether to extend this pilot project to other areas.

The above consideration is also one aspect of this project's theoretical relevance: investigating linkages between concepts of two distinct bodies of literature, place attachment and Visions of Nature. These links have not been made in the literature before; the closest we could find were Buijs (2009c), who discussed place attachment and framing of nature, De Groot and De Groot (2009) and De Groot (2012), who linked place attachment and Images of Relationship, and Gosling and Williams (2010) and Jorgensen and Stedman (2006), who connected place attachment with connectedness to nature and environmental worldviews respectively. However, it seems no previous study has linked place attachment with all dimensions of Visions of Nature, a lacuna this study intends to address.

In addition, this project looks at place attachment in the context of a concrete change to the area; Stedman (2002) argues that place attachment can contribute to resistance to proposed changes to the landscape, while Devine-Wright and Howes (2010) note that "conflicts are particularly likely when restorative places (i.e. those considered to be natural, wild or places to escape from cities) are impacted by development proposals that are interpreted to be 'industrial' or 'technological' in nature" (p. 272). Since the proposed longitudinal dams could be interpreted this way, it will be interesting to see whether they indeed arouse negative emotions in the recreationists.

Finally, on a more methodological note, Hernández, Hidalgo, and Ruiz (2014) state that mixed methods investigations could help further the field of place attachment research; the authors could only find three examples of previous place attachment studies making use of a mixed methods approach, and two of those lacked the crucial conceptual clarity needed to contribute to advancement of the theory. This project aims to answer their call by making use of a theoretically well-founded and conceptually clear mixed methods approach to the research.

1.3: Research Goal and Questions

As mentioned before, this research project makes use of place attachment and Visions of Nature theory to capture the nature philosophy and place attachments of two groups of recreationist along the Waal. The research goal is formulated as follows:

The goal of this thesis is to gain insight into the place attachments and Visions of Nature of boaters and fishermen along the Wamel-Ophemert trajectory of the Waal, and to link these concepts to background variables and evaluations of the intended measures

The research questions logically derived from this research goal are the following:

1. What are the Visions of Nature of the fishermen and boaters in the project area?
2. What are the place attachments to the project area of the fishermen and boaters?
3. How are the Visions of Nature of the fishermen and boaters related to their place attachments?

4. How do these recreationists evaluate the intended measures of the pilot project?
5. How is their evaluation of the intended measures related to their Visions of Nature, place attachments and background variables?

The first four research questions emerge from the research goal and the theoretical discussion in Chapter 2. The fifth research question captures our interest in finding out whether place attachment, Visions of Nature and background variables are related to respondents' evaluation of the intended measures. As mentioned previously, and expanded on in Chapters 3 and 4, this research project makes use of a mixed methods approach; we will approach these questions using both qualitative and quantitative data.

It should be noted that while the background variables are not captured in a separate research question ("what are respondents' background variables" is not commonly included in studies as such) they are by no means tangential to the findings. As will be argued in more detail in paragraph 2.3.1., several of the background variables are included because we are interested to see if they influence place attachments, Visions of Nature or evaluation of the measures. For instance, gender is argued by several authors to influence which Values of Nature are emphasised, while time spent in an area was shown in several earlier studies to increase the level of place attachment felt for said area.

1.4: Reading Guide

This thesis is structured as follows. Chapter 2 provides a thorough literature review, intended as the theoretical framework for this study. Chapter 3 will reflect on some epistemological and methodological aspects of our research, while Chapter 4 will discuss our research design. Chapter 5 will then report our findings and the results of our qualitative and quantitative analyses, while Chapter 6 will wrap up the thesis with a conclusion and reflection.

Chapter 2: Literature Review

The theoretical foundation of this study is based on two strands of theoretical material: Place Attachment / Sense of Place theory, and the theory of Visions of Nature. These two strands were chosen because they allow us to delve into two distinct elements of people's perspective on their environment, both of which are important for understanding stakeholder perceptions of the landscape. On the one hand, place attachment looks at the bonds people develop with specific places; understanding recreationists' attachment to the Waal river is important for understanding their evaluation of the intended measures. On the other hand, Visions of Nature gives us insight into the more abstract philosophy of nature of these recreationists. These nature philosophies are of interest in this project for several reasons, for instance because they can give an indication as to what degree people tolerate human intervention in nature.

The two theoretical strands, place attachment and Visions of Nature, will be discussed in paragraphs 2.1 and 2.2 respectively. Paragraph 2.3 describes the background variables we will include in this study, and presents the conceptual model used to organise the concepts discussed in the earlier paragraphs.

2.1: Place Attachment / Sense of Place

The literature on place attachment and sense of place is exceedingly complex. Shamai (1991) already noted more than 20 years ago that the terminology is vague and used differently by different authors, and ten years later Hidalgo and Hernández (2001) agreed that place attachment research faced "no agreement regarding its name, definition or the methodological approach best suited to deal with it" (p. 273). This issue seems not to have been resolved during the past two decades, as Trentelman (2009) recently described the literature as "immense and confusing, with a good deal of inconsistency in concept use" (p. 192), while Hernández et al. (2014) referred to a "terminological and conceptual chaos" (p. 125). An example of this lack of conceptual clarity is the title of this paragraph: Trentelman (2009) notes that "'place attachment' and 'sense of place' are both used as overarching place concepts, contributing to charges of inconsistency within the place literature" (p. 201). Since this body of research is both vast and complex, this literature review unfortunately can be neither highly detailed nor fully comprehensive. As such, the main goal will be to provide the reader with an overview of the different strands of research in the field, however simplified the categorisations may be. It is our hope that this literature review will provide some overview of this vast body of research, while also creating a well-founded theoretical framework for the place attachment scale used for our own empirical investigation.

This paragraph is structured as follows: paragraph 2.1.1 will provide a brief discussion of the historical development of place attachment research, after which paragraph 2.1.2 will discuss some recent developments in the field. Paragraph 2.1.3 will then discuss how place attachment will be operationalised in this study. For our historical discussion, we will follow authors such as Shamai (1991), Stedman (2002) and Lewicka (2011) in distinguishing between positivist and non-positivist or

phenomenological approaches to place research. While Williams (2014) criticises such a simplistic distinction for doing no justice to the complexity of the different strands of research, we decided to retain it. This choice was made because it allows for the creation of an understandable frame of reference, which we feel contributes to more easily grasping the way strands of place attachment research have reacted to one another.

2.1.1: Historical Development of Place Research

Research on places, stated most generally, investigates the meaning that specific locations hold for people. The phenomenological and the quantitative strands have their roots in the fields of social geography and social psychology respectively, and the field first developed from distinctly constructivist roots. Greider and Garkovich (1994) are a good example of such a constructivist approach; they noted that ‘places’ or ‘landscapes’ are physical spaces invested with meaning. According to the authors, landscapes “are the reflections of how we define ourselves” (Greider & Garkovich, 1994, p. 2). Consider this passage from their work, which beautifully illustrates this constructivist notion of place:

Why does a real estate developer look across an open field and see comfortable suburban ranch homes nestled in quiet cul-de-sacs, while a farmer envisions endless rows of waving wheat and a hunter sees a five-point buck cautiously grazing in preparation for the coming winter? The open field is the same physical thing, but it carries multiple symbolic meanings that emanate from the values by which people define themselves. (Greider & Garkovich, 1994, p. 1)

This constructivist approach, often taking the form of phenomenological research, blossomed and produced an abundance of material. However, criticism was levelled at it as well. Shamai (1991) is often cited as an important early critique. Highlighting the lack of clarity and consistency in terminology, he took a more positivist approach by using survey data to measure the *level* of sense of place, rather than focusing on its meaning. Stedman (2002) also accused the research up to then of suffering from a “relative lack of construct clarity and an avoidance of hypothesis testing” (p. 562). From these critiques a call for more structured and quantitative approaches was launched.

The more quantitative research approach that was practiced as a result led to a tradition of research into statistical models and survey data on place attachment and sense of place, which has produced an impressive body of work. Examples include research into the influence of social communities on physical place bonding and the development of ‘special places’ (Mesch & Manor, 1998; Eisenhauer, Krannich, & Blahna, 2000; Brehm, Eisenhauer, & Krannich, 2006), links between recreation behaviour and place attachment (Bricker & Kerstetter, 2000; Budruk, Wilhem Stanis, Schneider, & Heisey, 2008), different spatial scales of attachment (Hidalgo & Hernández, 2001), and connections between place attachment and landscape values (Brown & Raymond, 2007) or environmental behaviour (Scannell & Gifford, 2010a). Brown and Raymond (2007) note that the

term 'sense of place' is associated more with the qualitative / phenomenological school, while 'place attachment' became the terminology more often used by the psychological school (p. 90).

A recurring difficulty in providing an overview of these works is the lack of conceptual clarity referred to earlier: different authors use different concepts to measure attachments to place. Two frequently recurring dimensions can be distinguished, however. Firstly, many authors look at place identity, which is an affective bonding with places, to the point where a certain place becomes part of a person's identity. Secondly, a recurrent dimension in the literature is place dependence, which refers to a more instrumental bond that develops as a result of the place providing unique opportunities. Davenport and Anderson (2005) define these two concepts as follows:

The construct *place identity* is tied to more symbolic meanings of place and is based on the notion that places serve various functions in identity development that promote a sense of belongingness. *Place dependence* reflects more tangible meanings of place. It denotes a goal-oriented relationship with place and the belief that a place directly or indirectly satisfies certain physical or psychological needs. (p. 628)

While these two dimensions are often discussed in studies, how they are included differs markedly; two main conceptual models as used in the literature can be distinguished, however. Firstly, the research group around Gerard Kyle has written several papers on quantitative approaches to studying the place attachment of recreationists (Kyle, Absher, & Graefe, 2003; Kyle, Bricker, Graefe, & Wickham, 2004a; Kyle, Graefe, Manning, & Bacon, 2004b; Kyle, Graefe, & Manning, 2005). Their research uses place attachment as the overarching variable, with place identity and place dependence as the component variables. Kyle et al. (2005) broadened their model slightly by including social bonding as a third dimension of place attachment. Similarly, Brown and Raymond (2007) and Budruk et al. (2008) distinguish place identity and place dependence as the components of place attachment, and Bricker and Kerstetter (2000) split place attachment into place identity, place dependence, and lifestyle.

A different approach is taken by the research group based around Richard Stedman, which has published several papers on their approach to quantitative place research (Jorgensen & Stedman, 2001; Stedman, 2002; Stedman, 2003; Jorgensen & Stedman, 2006). Their conceptualisation takes sense of place as the overarching concept instead, with place attachment, place identity and place dependence as the three dimensions. An exception is Stedman (2003), who included place satisfaction in order to assess evaluative beliefs. The two conceptual models as employed by the Kyle and Stedman groups respectively are shown in Figure 2.1.

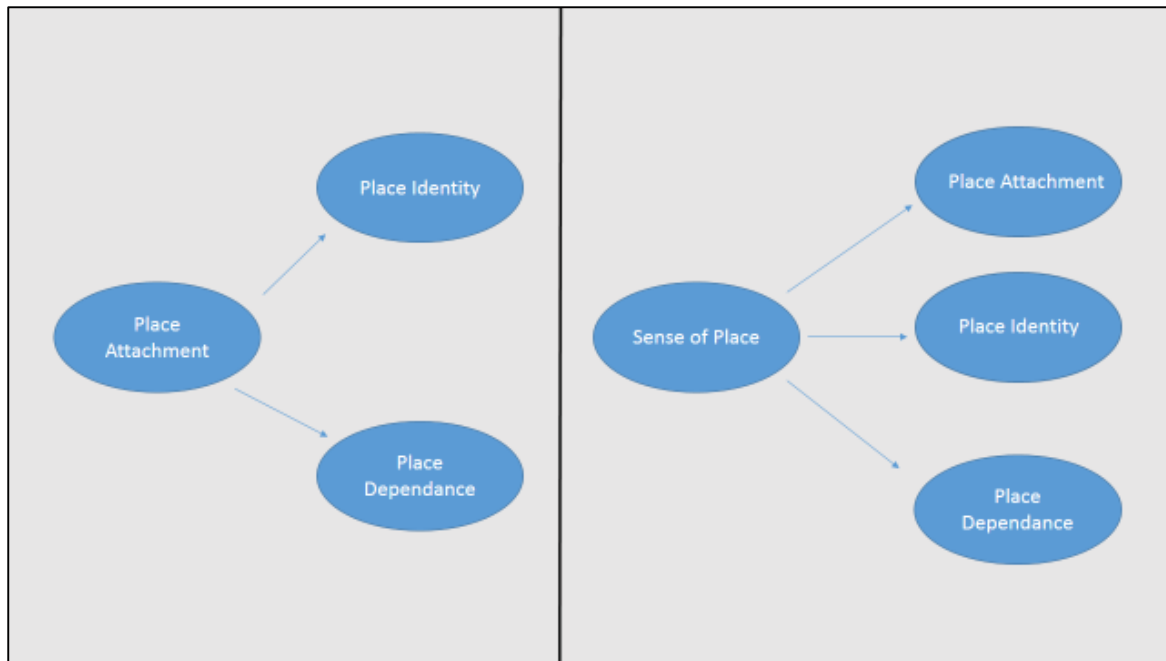


Figure 2.1: Place attachment as the overarching dimension (left) or as one dimension of sense of place (right)

Trentelman (2009) notes that the model on the left in Figure 2.1 is associated more with research into recreationists, while the model on the right is more commonly used for residents' place attachments (p. 201).

While these two models are the most commonly used, different conceptualisations also appear within the psychological literature. For instance, Hernández, Hidalgo, Salazar-Laplace, and Hess (2007) note that some authors have constructed a unidimensional model wherein place attachment and place identity are merely two terms referring to the same concept (p. 311). Hammitt, Backlund, and Bixler (2006) took the opposite approach by broadening the model: they argued that the more commonly used models “may not be reflective of broader meanings that recreationists ascribe to recreation places” (p. 20), and responded by constructing a model with five dimensions: familiarity, belongingness, identity, dependence and rootedness. While their results were not completely convincing regarding the validity of these five dimensions, the authors did note that research on place bonding would profit from dimensions “beyond the two commonly used in recreation research: place identity and dependence” (Hammitt et al., 2006, p. 36). Another suggestion is made by Devine-Wright (2009), who uses social representation theory to argue for more emphasis to be paid on the social and symbolic elements of developing attachments to place.

The proliferation of these more positivist approaches to place attachment does not, however, mean that the more phenomenological approaches that the field originated from are no longer used. Such constructivist place attachment studies, often using methods such as grounded theory, remain popular as well. A strong call for such methods to continue to be used was made by Davenport and Anderson (2005). These authors noted that, while the contributions of more positivist researchers such as Stedman has taught us much about the relative strengths of different elements of attachment, “measuring the strength of attachment based on identity or dependence

does not tell us why identity is important or what it means to depend on a place” (p. 629). The authors made use of grounded theory to develop four different kinds of attachment to a river: river as identity or river as tonic (which are comparable to place identity and place dependence respectively), but also river as sustenance or river as nature. In other words, the goal of these studies is not to discover relative strengths of different dimensions of place attachment, but to discover what this place attachment is and what it means to people. Similar approaches include Lindemann (2011), who used grounded theory to investigate attachments to the Elbe and Rhine rivers, Kyle and Chick’s (2004) narrative approach to tapping into the place attachments of campers on an agricultural fair, and Manzo (2005), who used grounded theory to investigate both positive and negative attachments to places. Both Kyle and Chick (2004) and Manzo (2005) illustrated that the concept of ‘home’ does not necessarily have to be limited to one’s place of residence, as it can include other meaningful places as well.

2.1.2: Recent Developments in Place Research

The field of place attachment research is vast and ever evolving; new topics that have inspired place researchers recently include attachment in the context of the increased physical and virtual mobility of the twenty-first century (Gustafson, 2014) and negative place attachments due to stigma and trauma (Manzo, 2014). Though this literature review, as stated previously, makes no claim to be comprehensive, hopefully the previous paragraph managed to provide an overview of the development of different strands of research in the field of place attachment. In this paragraph some current developments in place research will be discussed. Two developments will be highlighted here: one conceptual, and one methodological.

Firstly, the preceding discussion will hopefully have demonstrated the diversity of approaches and conceptions used in the field; while this certainly complicates matters for a researcher entering the field for the first time, it does not have to be a bad thing. Manzo and Devine-Wright (2014) note that “it is a matter of opinion whether this plurality is problematic or reflects a healthy diversity” (p. 4), and Williams (2014) goes one step further by stating that critical pluralism is the only way to capture the significant breadth of the topic. However, the diversity of approaches has unsurprisingly led to an increasingly strong call towards overarching theory-building.

In the pursuit for such theory-building and an integration of all these different strand of research, some authors have recently made attempts to construct multidimensional models that aim to capture the wide variety of dimensions employed in place research. One such attempt is made by Scannell and Gifford (2010b), who constructed a model (see Figure 2.2) containing elements of place bonding (which is close to the traditional concept of place attachment), person bonding (which is concerned more with the person feeling the attachment) and process bonding (which carries with it elements of the social psychological approach of Stedman’s work). Considering that it is such a broad model, Scannell and Gifford (2010b) noted that “this is not to say that all levels of the place attachment concept must be examined in each study” (p. 8); instead, the authors aimed to provide researchers with a comprehensive overview of all the dimensions that potentially could be included in a research project on place attachment.

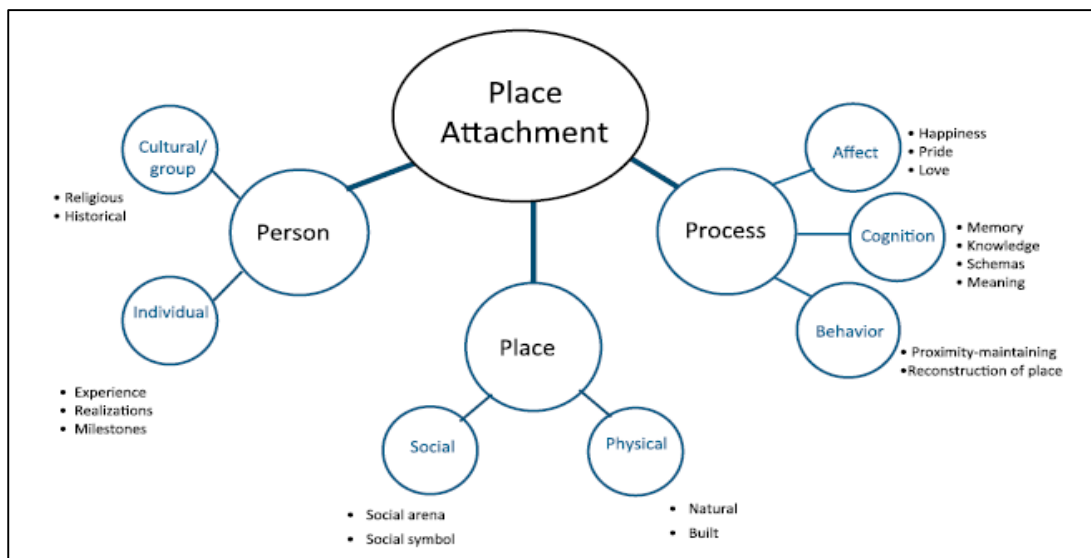


Figure 2.2: The tripartite model of place attachment (Scannell & Gifford, 2010b, p. 2)

A second attempt at such a comprehensive model was made by Raymond, Brown, and Weber (2010). Their model (see Figure 2.3) distinguishes between the personal context, where we find the traditional variables place identity and place dependence, the community context, where we find social attachments, and the natural environment context, which contains attachments to physical places. Despite being captured under the joint header ‘personal context’, place identity and place dependence are considered separately. In a later study, the authors also decided to split the community element into friend and family bonding, though results of that decision were mixed (Raymond et al., 2010, p. 432).

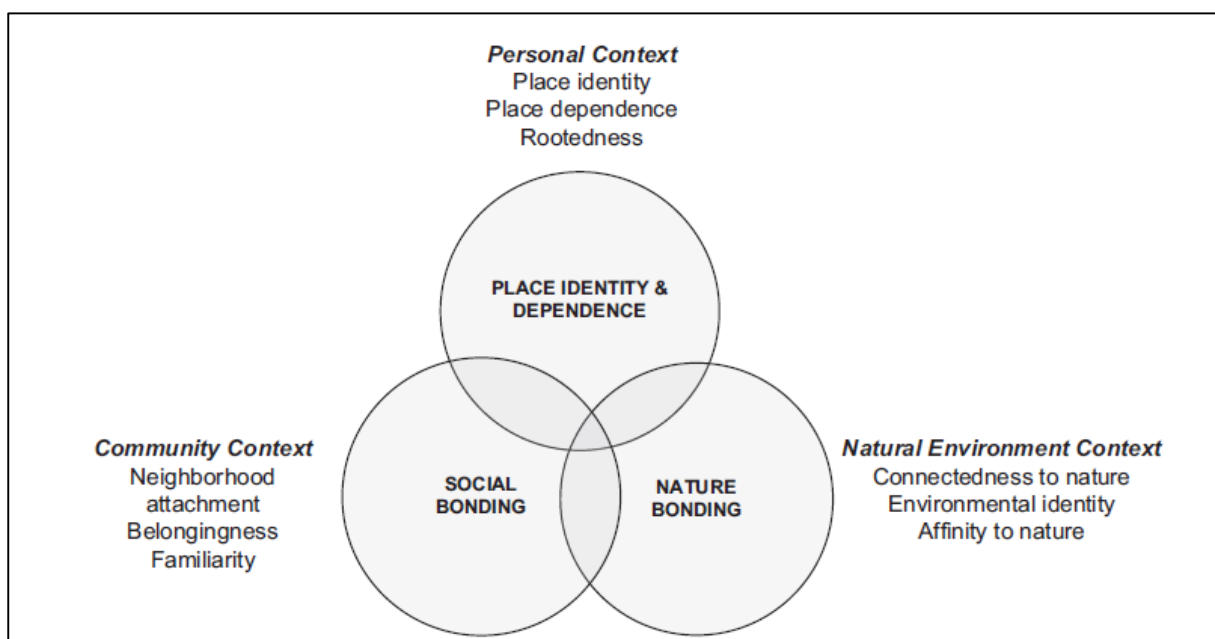


Figure 2.3: Typology of place attachment (Raymond et al., 2010, p. 425).

Secondly, one methodological development in recent years is an interest in mixed methods research on place attachment. The value of both quantitative and qualitative research has been acknowledged for quite some time; just to give one example, in one of their quantitative papers on recreationists' place attachment Kyle et al. (2004a) made a call for qualitative research in order to complement their findings (p. 138). Hernández et al. (2014) note that studies that cross the methodological divide could constitute an improvement of our understanding of attachment to place. Examples of mixed methods studies in the field include Devine-Wright and Howes (2010), who combined focus groups and surveys to study the response to placement of an off-shore wind farm, Boğaç's (2009) combination of interviews, surveys and drawings to discuss forced relocations of Cypriot refugees, and Ryan's (2009) use of interviews, photo elicitation and telephone interviews to look into the link between tourists' place attachment and consumption behaviour.

The use of mixed methods carries with it several advantages. Both Lewicka (2011) and Devine-Wright and Howes (2010) noted that mixed methods studies into place attachment are promising new approaches to studying the bond between people and their 'special places', and Ryan (2009) went one step further by arguing that combining the strengths of the qualitative and quantitative strands of place research is an important next step in theory-building (p. 113). However, caution must also be advised. Hernández et al. (2014) argue that, of the three mixed methods publications discussed above, only Devine-Wright and Howes (2010) offer any clarity as to how exactly their methods were applied and combined (p. 132).

2.1.3: Conceptualisation of Place Attachment in this Study

Having provided the context for the place attachment element of this study, we will now discuss how place attachment will be conceptualised here. The work we will draw on most is the comprehensive framework of Raymond et al. (2010). This means we will distinguish four constructs: place identity, place dependence, social bonding and nature bonding. Importantly, this allows us to discuss identity and dependence separately, as well as separating natural and social elements of place attachment. Both these divisions have been called for in the literature.

By distinguishing between identity and dependence we acknowledge the work of previous authors who argued that these two concepts are related but not identical. An oft-cited illustration of this point is Kyle et al. (2004b), who demonstrated that hikers on the Appalachian Trail were more critical of the state of the trail when their place identity was high, but that high place dependence had the opposite effect. Acknowledging the same distinction, Hernández et al. (2007) argued that place identity may take much longer to develop than other elements of place attachment. In fact, this distinction between identity and dependence is the main reason that we follow Raymond et al. (2010) and not Scannell and Gifford (2010b); Raymond et al. (2010) note that in Scannell and Gifford (2010b) place dependence and place identity remain "implicit within the natural environment place attachment ... [dimension] of the tripartite model" (p. 426).

In addition, distinguishing the physical and social dimensions has been repeatedly emphasised in the literature. Authors such as Eisenhauer et al. (2000) and Scannell and Gifford (2010a) showed how social attachments and physical attachments can vary in their relative importance, while authors such as Hidalgo and Hernández (2001), Stedman (2003) and Lewicka (2011) argued that there has been little emphasis on physical bonding compared to social bonding. Though she warns that distinguishing between ‘social’ and ‘physical’ attachments is at least terminologically somewhat vague, Lewicka (2011) still illustrates the importance of considering both types of attachment separately in the following passage:

Some people feel attached to a place because of the close ties they have in their neighborhood, generational rootedness, or strong religious symbolism of the place, that is, because of social factors; others may feel attached to the physical assets of places, such as beautiful nature, possibility of recreation and rest, or physically stimulating environment. (p. 213)

Taking the preceding discussion into account, our conceptualisation of place attachment for this study is presented in Figure 2.4. In paragraph 2.3 this conceptualisation will be included in the overarching conceptual model. In Chapter 4 we will discuss the operationalization of these four dimensions, including the scale items used to measure it in the survey.

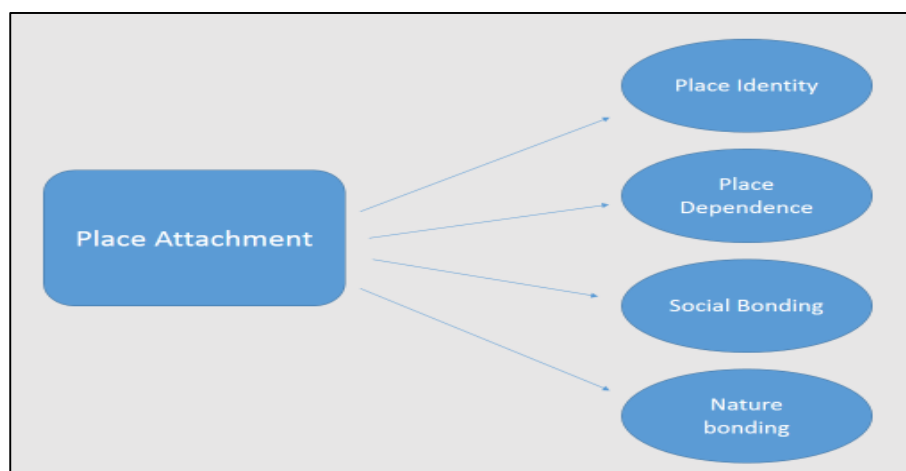


Figure 2.4: Conceptualisation of place attachment in this study (largely adapted from Raymond et al., 2010)

2.2: Visions of Nature

The theory on Visions of Nature was developed within the broad field of literature on nature valuation, nature connectivity and environmental philosophy. Visions of Nature aims to measure the everyday philosophy, also referred to as lay philosophy, of people regarding nature. It was developed by Riyan van den Born in her PhD thesis *Thinking Nature* (2007), wherein it was updated and improved over several studies and publications (Van den Born, Lenders, De Groot, & Huijsman, 2001; De Groot & Van den Born, 2003; Van den Born, 2006; Van den Born, 2008). Visions of Nature is an interdisciplinary field of research; De Groot (2010) notes that while the terminology is distinctly

philosophical, it is empirical in nature and contains sociological and psychological elements as well (p. 17-20). Van den Born (2007) describes the approach as empirical philosophy: it is explicitly concerned with 'lay' philosophy rather than the views of professional philosophers.

Visions of Nature attempts to gain insight into three elements of this everyday philosophy of nature: Values of Nature, Images of Nature, and Images of Relationship (Van den Born, 2007, p. 9). The dimensions of Visions of Nature theory are visualised in Figure 2.5. These dimensions have both been studied in their own right, as well as connected to topics as diverse as nature conservation (Lenders, 2006), religion (De Groot & Van den Born, 2007), river management (De Groot & De Groot, 2009; De Groot, 2012; Fliervoet, Van den Born, Smits, & Knippenberg, 2013) and perceptions of non-native species (Verbrugge, Van den Born, & Lenders, 2013).

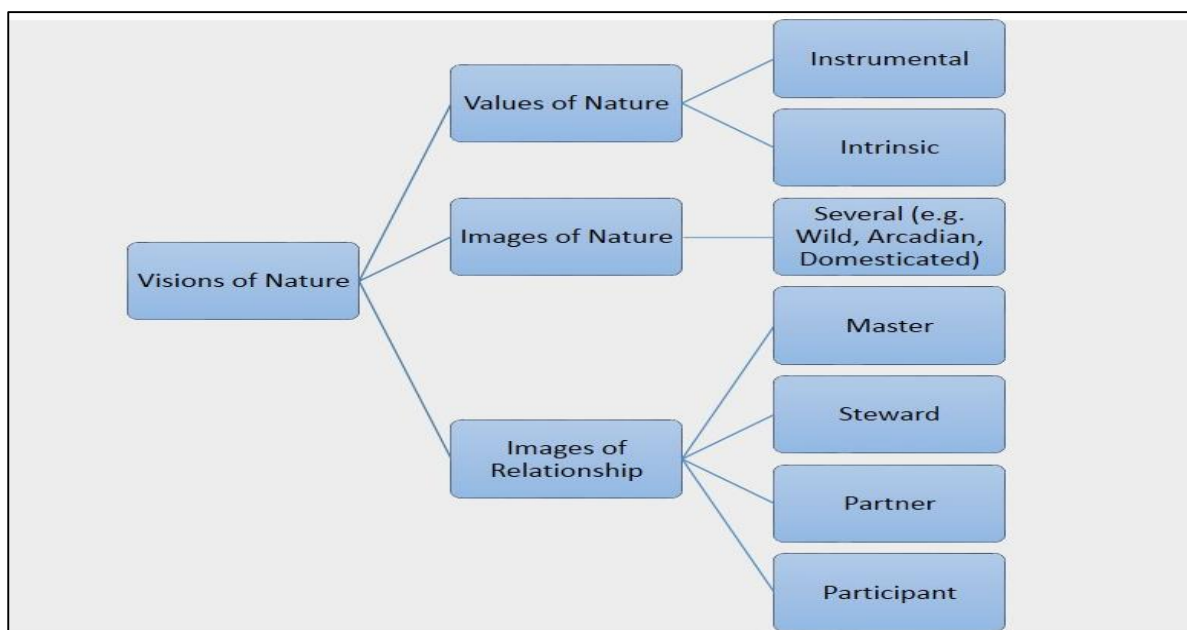


Figure 2.5: Visions of Nature (based on Van den Born, 2007).

The next three subparagraphs will discuss the three dimensions of Visions of Nature separately, including the use of similar concepts in other studies, after which paragraph 2.2.4. will conclude on the theory as a whole. Before starting this literature review, one qualifying statement is in order. While the three dimensions of Visions of Nature indeed denote three different elements of environmental philosophy, they are strongly interrelated. As paragraph 2.2.4 will illustrate, studies discussing values tend to lapse into discussions of human relationships with nature as well, and descriptions of nature images often also make connections with valuation issues. Buijs (2009b) argued that there is some conceptual overlap in the dimensions of Visions of Nature, as according to him “the values of nature are one of the elements of the images of the human–nature relationship” (p. 48). However, though the considerable overlap between these two concepts is duly noted, we do argue here that they measure distinct elements of environmental philosophy: Values of Nature concerns itself with nature *valuation*, while Images of Relationship is more concerned with human *positioning* in relation to nature. As such, here we follow the Visions of Nature theory in discussing the concepts separately.

2.2.1: Values of Nature

The dimension of Values of Nature concerns itself with the question why nature is important to people. A distinction is made between instrumental or functional values and intrinsic values (Van den Born, 2007, p. 9). Instrumental values are an anthropocentric valuation logic: nature is important because of health benefits such as clean air or water, aesthetic benefits, or recreation opportunities. In other words, nature's value comes from what it can provide to humans. On the other hand, intrinsic values are a more ecocentric perspective wherein nature has value regardless of human use. This distinction between instrumental and intrinsic values, or anthropocentrism and ecocentrism, is a mainstay in literature on environmental ethics and philosophy (Drenthen and Keulartz, 2008). Gagnon Thompson and Barton (1994) showed how several terms are used in different publications to mean the same thing: instrumental, functional, utilitarian or anthropocentric logics stand opposite to ecocentric, spiritual or intrinsic ones.

However, some authors have argued that ecocentrism and anthropocentrism are the two extremes on a sliding scale, and that further classification is necessary. For instance, Norton (1984) distinguished between strong and weak anthropocentrism. Whereas strong anthropocentrists take human functional demands as their entire valuation approach to nature, weak anthropocentrists take a more balanced approach by recognizing "that felt preferences can be either rational or not" (Norton, 1984, p. 135). However, a weak anthropocentrist differs from an ecocentrist due to the latter's emphasis on intrinsic valuation. Stern, Dietz, and Kalof (1993) and Stern and Dietz (1994) also distinguished two anthropocentric value orientations alongside a biospheric orientation: an egoistic one, which is strongly focussed on the self, and a social-altruistic one more oriented towards welfare of others. Similar dimensions of environmental values are found in writings from the field of environmental psychology, where questions of environmental values are linked to attitudes and concern; for instance, while Kaiser, Wölfling, and Fuhrer (1999) included both human-centred items such as "I am responsible to a supernatural force" and more ecocentric ones such as "the earth's value does not depend on people; it is valuable in itself" under the general header 'Environmental Values' (p. 9), Schultz and Zelezny (1999) distinguished between anthropocentric values, which included the social-altruistic dimensions of Stern and Dietz (1994), and biocentric / ecocentric values.

Even broader models exist as well. One example from the field of leisure studies is the Natural Area Value Scale (NAVS) developed by Winter and colleagues. Their first model (Winter & Lockwood, 2005) distinguished between intrinsic and instrumental values, with instrumental values being split up into use and non-use values, which are classifications from the field of environmental economics. Use values were then further divided into the value of goods, recreational and aesthetic benefits, while non-use values included preservation and future generations (p. 271). Winter (2007) then broadened the model even further by including spiritual values as well.

The complexity increases even further once we closely scrutinize the term 'intrinsic value'. For instance, authors such as Schultz and Zelezny (1999) used biocentricity and ecocentricity interchangeably to denote an orientation towards intrinsic value. However, Lockwood (1999) argued that the two words denote different conceptions of intrinsic value: the author distinguished between biocentricity as denoting "intrinsic value associated with individual life forms and species", and ecocentrism meaning "intrinsic value that includes individual life forms, species and ecosystems" (p. 386). Furthermore, the term 'intrinsic value' itself refers to several similar but distinguishable element of value. For instance, O'Neill (1992) distinguished between intrinsic value as non-instrumental or non-use value, intrinsic value as being non-relational and inherent to a being, and intrinsic value as objective value, meaning that something has value without a human 'valuer' there to value it (p. 119-120). Nordstrom (1993) provided us with a similar distinction: intrinsic value can mean either inherent value, systemic / ecosystem value, or value for being good for its own sake (p. 474-475). Morito (2003) argued that non-instrumental value is a subjectivist approach to intrinsic value, as it depends on the valuer, while calls for inherent and non-relational values to be acknowledged are objectivist approaches, as they both assume a value independent of human valuation (p. 318).

Some conceptions of intrinsic value also face criticism. For instance, O'Neil (1997) noted that a systemic conception of intrinsic value tends to "falsely attribute moral standing to species", which the author objected to by arguing that "even if a species has interests or a good of its own, it cannot have moral standing because species lack sentience" (p. 45). O'Neill (1997), in a similar vein, argued that it is difficult to uphold the ontological claim that there is intrinsic value 'out there' independent of human valuation, and that a more anthropocentric approach allows the discussion to move from rights of nature to obligations of humans, which the authors deemed more productive. Attfield (1998) argued that what environmental economists refer to as 'existence value' is not identical to intrinsic value as discussed in environmental ethics, despite often being treated as such.

Taking this complexity into account, it is no surprise that previous studies into Visions of Nature found somewhat inconsistent results regarding the recognition of intrinsic value of nature. For instance, Van den Born et al. (2001) found that almost twice as many respondents indicated intrinsic value as being the source of value of nature compared to usefulness to humans, yet when asked "what are the reasons why nature is important?" the most common answer was "human health" (p. 72). Van den Born (2008) also found that many respondents struggled to understand the notion of intrinsic value (p. 101); as we have seen here, so do professional scholars. In fact, authors such as O'Neill (1992) and Morito (2003) have argued for abolishing the term 'intrinsic value' altogether. However, in her essay "Why Environmental Ethics Shouldn't Give Up on Intrinsic Value", McShane (2007) countered that the concept is still helpful for understanding different approaches to nature valuation. While acknowledging that the concept of intrinsic value is highly complex, and possibly less convincing for people than more tangible instrumental values, she also argued that everyday values such as love and respect are forms of intrinsic value that come quite naturally to people (p. 53). She also explained that instrumental valuation cannot be used to assess these kinds of bonds:

If you were to ask me how much the friendships I have are worth to me in dollar terms—for example, by asking how much I would pay to keep a friendship, or how much you would have to pay me to be willing to give up a friendship—I would have no answer for you, not because my friendships have infinite value to me or because they have no value at all, but rather because you are asking me to extend an economic mode of valuation to an area where it is not appropriate. (McShane, 2007, p. 55)

In other words, while the simple distinction between instrumental and intrinsic value as used in Visions of Nature theory somewhat obscures a complex and longstanding debate within environmental ethics on the exact nature of the concepts, we agree with McShane (2007) that intrinsic valuation is something we all do in our lives, and as such not entirely a foreign concept to people. Several empirical studies into Values of Nature have demonstrated that while people might struggle with the instrumental/intrinsic terminology it nevertheless forms an important part of people's valuation logic; Winter (2007) found that "intrinsic and spiritual values in particular are clearly important to many people" (p. 612). It was thus decided to maintain the distinction in this study.

2.2.2: Images of Nature

The second dimension of Visions of Nature is 'Images of Nature', which is concerned with the question what people consider to be 'nature' and what not, or what constitutes 'real' nature. This question has gained prominence with the rise of constructivist discussions of nature; after all, what constitutes 'domesticated' or 'wild' nature, or 'real' and 'fake' nature, is at least partly constructed through individual perceptions and can thus differ between people (Stone, 2005; Van den Born & De Groot, 2009). The degree to which nature is socially constructed will not be discussed here (more reflections on this topic are provided in Chapter 3); suffice to say that opinions differ on what makes an area 'natural' or not, which is why the topic is included in Visions of Nature.

An earlier study into different ways to look at the same natural area is Gobster (2001). Based on interviews with different stakeholder groups, the author arrived at four different views on the future of an urban park: a designed nature based around landscape architecture, a wild nature to facilitate bird populations, a recreational nature which had to be 'useable', and a historical nature based on Pre-European settlement landscapes (p. 40). Gobster noted that these four images were not "monolithic visions advocated by any one group" (p. 46), since people were neither identical nor always consistent in their expressed image of nature (p. 47). On the topic of perceptions of river landscapes, both Disco (2002) and Wiering and Arts (2006) note that in the Netherlands the river was traditionally seen as a wild and threatening entity, with the 1970s-80s signalling a (limited) shift towards considering the ecological value of the river area.

Moving the discussion towards the more archetypical nature representations that Images of Nature refers to, a recurring typology in the literature is a tripartite distinction between functional, Arcadian and wild Nature. These Images of Nature are recognised in both theoretical and empirical

discussions on the topic. On the theoretical side, Swart, van der Windt, and Keulartz have published several articles describing these three Images of Nature (Swart, Van der Windt, & Keulartz, 2001; Keulartz, Van der Windt, & Swart, 2002; Van der Windt, Swart, & Keulartz, 2006). Based on policy documents and relevant literature Swart et al. (2001) characterised these images as follows (p. 234-236): the image of wild nature centres around expansive, independent nature with an emphasis on biological processes, Arcadian nature values balancing nature and culture to create patterned nature conservation, and the functional image of nature emphasises a form of nature that is “adapted to the current utilization of the landscape such as modern agriculture, hydro-engineering and urban functions” (p. 236). On the empirical side, a factor analysis performed by Van den Berg, De Vries, and Vlek (2006) on landscape evaluations of three groups of students revealed three Images of Nature as well: useful nature (which bears similarity to functional nature), spontaneous nature (which evokes elements of wild nature) and healthy nature, which seems to be a middle ground between functionality and wilderness (p. 49-50).

Buijs has also carried out several studies into nature images, often connected to framing and social representation theory (e.g. Filius, Buijs, & Goossen, 2000; Buijs, Elands, & Langers, 2009; Buijs, Arts, Elands, & Lengkeek, 2011). Filius et al. (2000) distinguished between three Images of Nature: wild nature (expansive and untouched), Arcadian nature (well-kept and attractive) and broad nature (functional); Buijs et al. (2009) used a similar distinction between wild, inclusive and functional nature. Buijs (2009a) broadened this typology into five Images of Nature: wild nature, autonomous nature, inclusive nature, aesthetic nature and functional nature; the first four being different variations of the traditional Arcadian nature (p. 428). The autonomy image was later dropped in Buijs et al. (2011) due to it not being reproduced in other studies (Buijs, 2009b, p. 228).

Finally, the empirical research within *Thinking Nature* (Van den Born, 2007) developed different typologies as well. Van den Born et al. (2001) used a factor analysis to arrive at five Images of Nature: wild, Arcadian, penetrative, domesticated and utility (p. 70). De Groot and Van den Born (2003) reduced this scale into wild, Arcadian and penetrative nature, with wild nature here mostly consisting of items reflecting the elements such as “the sea” and “the wind” (p. 130). The qualitative study by Van den Born (2008) showed that for many respondents a lack of human interference was an important requirement for an area to be seen as ‘nature’; in addition, respondents’ own definition of nature tended to come down to “everything that grows and flourishes”, which also explains why penetrative nature was a recurring factor in earlier studies (p. 93).

2.2.2: Images of Relationship

The third dimension of Visions of Nature is Images of Relationship, which refers to different ideas about man’s relationship to nature. The starting point of our literature review here is the seminal article “The Historical Roots of Our Ecologic Crisis”, written by White in 1967. In this highly influential article White argued that the ecological crisis would only get worse due to man’s domineering attitude towards nature. He placed the blame for humanity’s highly anthropocentric attitude squarely on Christianity, and argued that it was due to biblical tenets that nature had been reduced to an object of use:

Man named all the animals, thus establishing his dominance over them. God planned all of this explicitly for man's benefit and rule: no item in the physical creation had any purpose save to serve man's purposes.... By destroying pagan animism, Christianity made it possible to exploit nature in a mood of indifference to the feelings of natural objects. (White, 1967, p. 1205)

White's article spurred interest into the ways people can relate to their environments, and his negative conclusions were an invitation to construe different ways of relating to the world around us. For instance, Stokols (1990) discussed an emerging "spiritual view of people-environment relations" (p. 642). Kanagy and Willits (1993) responded directly to White, and their research actually indicated a "direct association between religious involvement and environmental activities", which the authors attributed to the biblical image of man as the steward of the earth (p. 682). Bourdeau (2004) similarly argued that Christianity's conception of the human-environment distinction is split between a domineering and a stewardship notion; he also noted that "contemporary exponents of Christianity and Judaism have pointed out that the word 'dominion' should be understood as meaning really 'custody' or 'stewardship'" (p. 11).

Typologies of the human-nature relationship also moved beyond these domination and stewardship images. For instance, Kaltoft (1999) distinguished between dualistic positions, man as either a controlling manipulator or a nature developer, and a non-dualistic human-nature relationship which she called partnership (p. 47). Bourdeau (2004) noted that the two positions as advocated in the Christian tradition are different from the human-nature relationship as commonly held in Eastern religions, where the distinction between humans and nature is much less pronounced. An example of these beliefs is the work by Salmon (2000), who painted a detailed picture of the land management practices of the Rarámuri tribe in Mexico. He described their approach as 'kincentric' ecology, wherein humans and nature are both part of a "cycle of breath" and where people are participants in nature (Salmon, 2000, p. 1329). More participatory perspectives are not exclusive to indigenous tribes, however; Davies (2006) found that focus group participants in the United Kingdom expressed sentiments of humans being separate from nature, but also notions of both "belonging to something bigger" (p. 99).

On the topic of biodiversity management, Fischer and Young (2007) distinguished between humans as controlling managers, careful recreationists or ecocentric protectionists (p. 279), while Buijs, Fischer, Rink, and Young (2008, p. 71) distinguished five Images of Relationship: three dualistic positions (humans as users, enemies or stewards) and two non-dualistic ones (humans as responsible managers or as participants). Interestingly, Chhatre and Saberwal (2006) illustrated that a more participative relationship to nature is not necessarily better for biodiversity conservation, as it can prevent effective conservation efforts.

There have also been some studies on the connection between humans and nature from the field of social psychology. Kals, Schumacher, and Montada (1999) introduced the concept of ‘emotional affinity toward nature’, which included emotions such as happiness, freedom, safety, and also “feeling a oneness with nature” (Kals et al., 1999, p. 182), which bears similarities to the participatory perspective described above. The authors linked this emotional affinity to the idea of affection or love for nature as discussed in Kellert and Wilson’s *Biophilia Hypothesis* (1993), which claims that humans have an innate love for, and desire to be with, nature. A similar concept is ‘connectivity with nature’ as used by Dutcher, Finley, Luloff, and Johnson (2007). These authors describe connectivity with nature as “an intuitive sense of sameness with the world around (and within) us” and as “the perception of a force or essence that holds the universe together—the same essence or force that runs through all creation” (Dutcher et al., 2007, p. 479). Once again, the similarities to the participatory perspective are unmistakable. Gosling and Williams (2010) similarly describe ‘connectedness to nature’ as the “extent to which an individual feels that he or she is a part of nature” (p. 298).

Having presented a varied (but by no means comprehensive) overview of classifications of the human-nature relationship as discussed in the literature, the discussion will now move onto the typology as used in Visions of Nature. As mentioned at the start of paragraph 2.2, the goal of Visions of Nature theory in general is to check whether theoretical concepts as developed by philosophers are a part of lay peoples’ philosophies as well, and to carry out empirical work to unravel these “people’s philosophies” (De Groot, Van den Born, & Lenders, 2006). In fact, a literature review by Flint, Kunze, Muhar, Yoshida, and Penker (2013) revealed that the publications by Riyan van den Born and Mirjam de Groot on Visions of Nature make up a significant portion of the English-language journal contributions on empirical philosophical Images of Relationship (p. 211-212). For the dimension Images of Relationship, Van den Born (2006) gathered insights from several earlier theoretical studies to construct her own typology for empirical inquiry: Master, Steward, Partner and Participant. Figure 2.6 presents these Images of Relationship using the terminology of Hunka, De Groot, and Biela (2009), while Figure 2.7 visualises them schematically:

Mastery over nature	The attitude of human supremacy on Earth usually associated with Enlightenment and technological optimism.
Stewardship of nature	Nature is seen as a vulnerable system for which we are responsible. Humans stand above nature; however, this position brings both privileges and duties.
Partnership with nature	Humans and nature carry much of the same value and share the planet in a relationship of physical and maybe even spiritual exchange.
Participation in nature	The most ecocentric image, in which a key aspect of being human is to be part of the great system and process of Nature, physically and spiritually.

Figure 2.6: Images of Relationship (as described by Hunka et al., 2009, p. 431).

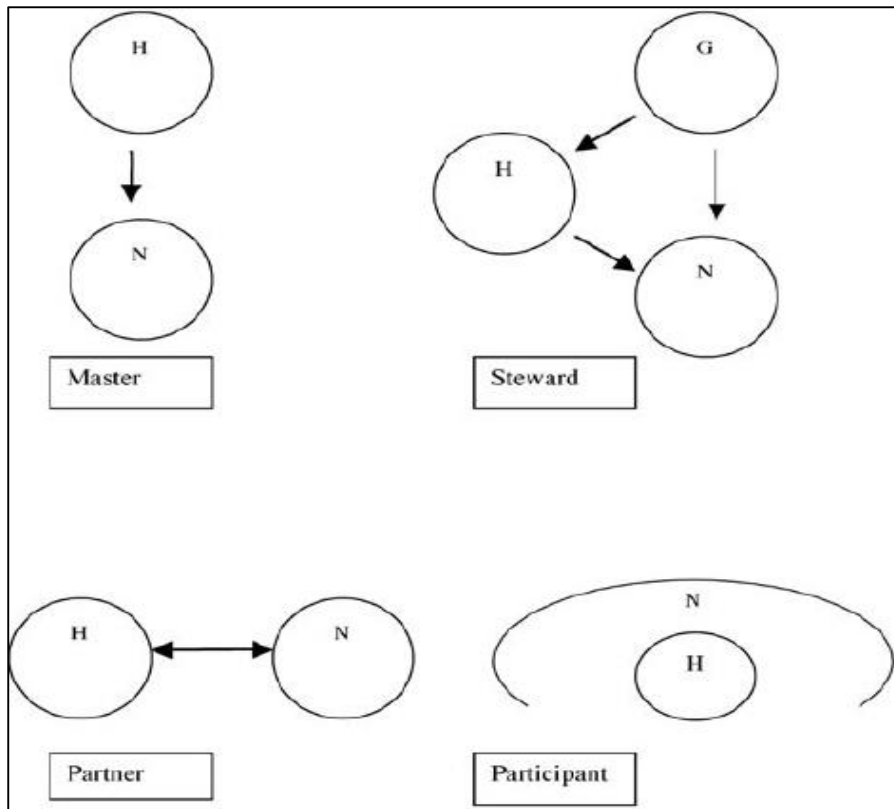


Figure 2.7: Visualisations of the Images of Relationship (Van den Born, 2008, p. 91).

We can see different Images of Relationship as discussed in this paragraph captured in this typology. The Master image is in line with the highly anthropocentric image criticized by White (1967), while the Steward is the more benign anthropocentric position as discussed by authors such as Kanagy and Willits (1993). The Partner is a more ecocentric position wherein humans no longer stand above nature but are each other's equals, whereas the Participant image is the 'participatory perspective' referred to above, with a spiritual 'oneness' of humans and nature.

Van den Born (2006) found that Dutch respondents overwhelmingly rejected the Master image, strongly supported the Stewardship image, and showed quite some support for the Partner and Participant images as well. De Groot and Van den Born (2007) found that, contrary to White's (1967) thesis, religious respondents unanimously rejected the Master as well, with Christians and Muslims oriented towards Stewardship and Buddhists and Natives identifying most with the Participant. De Groot and De Groot (2009) noted that while their respondents agreed with an equal position of humans and nature, the Partnership image was rejected on practical grounds. The authors distinguished between Guardianship, a more ecocentric form of Stewardship, and Companionship, a romantic version of the Partner. De Groot, Drenthen, and De Groot (2011) found similar results to Van den Born (2006): rejection of the Master, high popularity of the Steward, and some adherence to Partner and Participant. Their Guardianship image was argued to be a "massive mainstream concept" with 90% adherence among their respondents (De Groot et al., 2011, p. 38).

Two points of interest deserve a mention as a result of earlier Visions of Nature studies. Firstly, the Image of Relationship that seems to be the most difficult to capture is Partnership. Both De Groot and Van den Born (2003) and Hunka et al. (2009) failed to find a separate Partner in their factor analyses, instead having Partnership items conflate with the Steward and Participant images. It should be reiterated that many respondents did identify with the idea of an equal position between humans and nature, but were sceptical regarding its practicality. Hunka et al. (2009) noted that their Polish respondents “tended to reject the Partnership image not because it would not be a good ideal but because it is unattainable in practice or even dangerous; human nature is too exploitative to cope with the freedom inherent in the Partnership image” (p. 445). Secondly, Van den Born (2008) noted that lay people seem to feel both responsible for and part of nature, which could be construed as an inconsistency in their philosophy. However, she argued that this actually reflects a longstanding philosophical debate on “the dual nature of human beings” (p. 103), once again showing the similarities between lay and professional philosophies of nature. In a similar vein, De Groot et al. (2011) noted that respondents tended to interpret the Steward as being both responsible for and equal to nature, which is different from the archetypical Steward standing above nature.

2.2.4: Synthesis

Having discussed the three dimensions of Vision of Nature separately in the preceding three paragraphs, this paragraph will briefly address a point made earlier: while the theory does distinguish the dimensions as separate, they are all strongly interrelated. Values and Images of Nature are often discussed jointly: for instance, Van den Berg et al. (2006) linked Images of Nature with prevalence of anthropocentric and ecocentric values, and Buijs et al. (2011) connected social representations of nature with questions of ecocentric, biocentric and intrinsic values. Values of Nature and Images of Relationship also show clear interrelations: the Master image is more oriented towards functional and anthropocentric values, while a Participant is likely to emphasise more intrinsic and ecocentric values. Authors such as Winter (2007) thus discussed anthropocentric and ecocentric values together with discussions of religious reflections on the human-nature relationship. However, some caution is required: Van den Born (2006) noted that the Images of Relationship should not be seen as simply “an ordinal scale (a continuum) of degree of anthropocentrism / eco-centricity”, since the Images also include elements of active vs. passive or even gendered differences (p. 67). Lockwood (1999) also cautioned that, while it is not illogical to expect an interrelation “between support for the position that humans must live in harmony with nature, and a belief in intrinsic value in nature”, this is not a guarantee (p. 386).

Images of Nature and Images of Relationship are also often discussed jointly, as are all three dimensions at once. Examples of such inclusive analyses include many of the works within *Thinking Nature* (e.g. Van den Born et al., 2001; Van den Born, 2008), but also works by other authors. Van der Windt, Swart, and Keulartz (2007) linked functional, Arcadian and wilderness Images of Nature with different “ethical perspectives”, which included both ecocentric and anthropocentric values as well as a Stewardship position (p. 219). Filius et al. (2000) and Buijs et al. (2009) included discussions on Images of Nature, anthropocentric and ecocentric values, as well as views on the appropriate

relationship between humans and nature. Finally, Bauer, Wallner, and Hunziker (2009) linked biophilic and biophobic values and wilderness images with different “Attitudes of Nature”, which bear similarities to Images of Relationship.

As we close the literature review on Visions of Nature, it was hopefully demonstrated that Visions of Nature is an inclusive approach to uncovering people’s everyday philosophy of nature, and one that is strongly grounded in previous work on values, images and the role of humans in nature. However, it is of course not the only scale used to measure these concepts. We will address here one major rival of the Vision of Nature approach: the New Environment Paradigm, and its successor the New Ecological Paradigm. Developed by Dunlap and Van Liere from the field of environmental sociology, the New Environmental Paradigm (NEP) aimed to assess whether a new ‘ecological worldview’ had surfaced in the United States. The original version, presented in Dunlap and Van Liere (1978), was employed to assess whether the public was reorienting itself towards heightened ecocentrism, and was used by many authors for this purpose (e.g. Schultz & Zelezny, 1999; Filius et al., 2000). However, it also came in for significant criticism. Schultz and Zelezny (1999), having used the scale themselves, noted that “the New Environmental Paradigm has 20 years of research behind it, but it measures only one type of environmental attitude” (p. 263). Lockwood (1999) and De Groot et al. (2011) added that the NEP is unsuccessful in identifying intrinsic value, and does not distinguish between different *kinds* of ecocentricity. In fact, Van den Born (2006) argued that the three dimensions of the NEP, “Balance of Nature”, “Limits to Growth” and “Humans over Nature”, do not measure ecocentricity as much as they measure different degrees of anthropocentricity (p. 68). Aside from the lack of intrinsic value items present, the NEP only includes items for the Master and Steward, the anthropocentric Images of Relationship, and no items for the Partner or Participant (Van den Born, 2006, p. 79; De Groot, 2010, p. 20).

The NEP scale was updated in 2000 to create a new version called the New Ecological Paradigm (Dunlap, Van Liere, Mertig, & Jones, 2000). The authors acknowledged the need to “update and broaden the scale’s content” and decided to add items on ‘human exemptionalism’ and ‘ecocrises’ to the earlier scale (Dunlap et al., 2000, p. 431-432). However, while this revision constitutes an improvement it does not seem to have remedied the core issues; in fact, Dunlap (2008) notes himself that the new NEP scale “measures the degree to which respondents view the world *ecologically*” (p. 10, own emphasis). As noted earlier, a key criticism was that the NEP scale did not distinguish between different *kinds* of ecological or ecocentric worldviews; this weakness is still present in the updated scale (Van den Born, 2006, p. 68; De Groot, 2010, p. 20). The advantage of using Visions of Nature is exactly that: it provides insight into the *different kinds* of ecocentric orientations people may display towards their environment.

2.3: Conceptual Model

The preceding two paragraphs have reviewed the literature on place attachment and Visions of Nature. In this final paragraph of Chapter 2, the conceptual model underlying this study will be presented. In paragraph 2.3.1 we will first discuss some of the background variables we have taken

along in our study, while paragraph 2.3.2 will merge the discussions in this chapter into the conceptual model which informed this study.

2.3.1: Background Variables

Along with the dimensions of place attachment and Visions of Nature, we included some background variables in our research as well. Some of the most important background variables are briefly discussed here, in order to explain why we decided to include them:

Age: age is a variable that is consistently included in surveys, yet very few authors provide a theoretical argument for including this variable, and it is rarely discussed in the findings of the papers reviewed in this chapter. The exceptions in place attachment research are Hidalgo and Hernández (2001) and Jorgensen and Stedman (2006), the latter noting that “there is some evidence to suggest that younger individuals think about places differently than their older counterparts”, specifically that younger respondents might emphasise stronger social attachments while older respondents could be oriented more toward physical attachments (p. 318). In works on Visions of Nature, De Groot and De Groot (2009) noted that age was correlated with Images of Relationship, as older respondents seemed more oriented towards the Master. As such, regardless of its rather limited role in the literature so far, age was included in the study.

Gender: unlike age, gender consistently plays a factor in reported conclusions, though with varied results. In place attachment research, Hidalgo and Hernández (2001) noted that in their sample “women show greater place attachment than men in all cases” (p. 280), yet Scannell and Gifford (2010a) found no difference between men and women, and Raymond et al. (2010) note that “to date, there is little empirical evidence that place attachment is significantly related to gender” (p. 432). A somewhat stronger picture emerges in the Visions of Nature literature, where authors such as Stern et al. (1993), Stern and Dietz (1994), De Groot et al. (2011) and especially Skår (2010) all argue that women perceive nature differently, often in a more ecocentric manner, which can be connected to the literature on ecofeminism. On the other hand, Van den Born (2006) and Van den Born (2008) found no significant relationship between gender and Images of Relationship. We decided to include the variable in our survey; as Chapter 5 will illustrate, however, our sample consisted almost entirely of men, which was actually in line with our expectations. As such, we were not able to make any comments on gendered differences.

Education: there seems to be little relationship between level of education and place attachment or Visions of Nature; for instance, neither Scannell and Gifford (2010a), Van den Born (2006) nor Van den Born (2008) found much support for a connection between the two. An exception is De Groot (2012), who noted that her data revealed a correlation between level of education and support for Room for the River projects (p. 7); however, no explanation was given why this correlation would exist. Regardless, the variable was included in our survey.

Religion: This variable was included from the perspective of Visions of Nature, as our preceding discussion of the theory will hopefully have made the links between certain Images of Relationship and religious beliefs clear. Studies such as De Groot and Van den Born (2007) amply discussed possible links between religion and Visions of Nature, which is why we included the variable ourselves.

Residence in the area and Childhood in the area: these two variables were included largely out of our own interest from the perspective of place attachment: we were interested whether attachments to a recreation area might differ if one also lives nearby, or if one spent an important part of their childhood in the area. The latter was also included because having spent time as a child near a natural area such as the Waal could influence how one bonds with natural areas later in life; Van den Born and Arts (2007) are one example of a study where childhood nature experiences were discussed in the context of adult views of nature.

Sense of safety: De Groot and De Groot (2009) included this measure, simply by asking respondents whether they felt safe along the river. Since the Room for the River measures are carried out in the interest of increased safety, it was relevant for this baseline study to inquire whether respondents feel safe recreating in the area, and whether they are aware of flood risks.

History of recreation in the area: several place attachment studies into local residents have identified length of residency as an important contributor to developing place attachment (e.g. Mesch & Manor, 1998; Jorgensen & Stedman, 2006); in fact, Lewicka (2014) noted that length of residency was one of the earliest items used to measure place attachment (p. 49). Authors such as Brehm et al. (2006) and Scannell and Gifford (2010a) hypothesised that length of residency could be more influential to social rather than physical bonding, while Lewicka (2011) added that physical bonds may develop more quickly than social bonds (p. 215). Raymond et al. (2010) found “significant positive relationships between length of residence, place identity, and place dependence”, but “no significant relationship ... between length of residence and nature bonding” (p. 430). As such, time spent in a place is expected to contribute to forming an attachment with it. However, since this study looks at recreationists rather than local residents, length of residency is considered less relevant. In lieu of length of residency it was decided to include a measure of recreation history. Budruk et al. (2008) suggested Experience-Use History (EUH), operationalised as “total visits, total years of use, and frequency of use of a site” (p. 529). We ended up focussing on this second dimension, and operationalised ‘recreation duration in the area’ as total years of use.

2.3.2: Conceptual Model

Having reached the end of Chapter 2, the preceding discussion will be visually represented in a conceptual model, which aims to visualise the concepts under investigation. First, however, we ought to reflect on the way concepts such as place attachment and Visions of Nature are expected to relate to one another. In order to be able to do so we will briefly look at how these concepts have been conceptually modelled in the literature.

In the literature on place attachment, conceptual models are usually provided in the more positivist studies. For example, Kyle et al. (2004b) used a ‘social justice framework’ wherein place attachment influenced peoples’ evaluation of their environments. A common model is the ‘attitude framework’ as used by many psychological approaches to place research. Stedman (2002) and Jorgensen and Stedman (2006) conceptualised place attachment as a predictor of behavioural intention; this is in line with Shamai (1991). Brehm et al. (2006) looked at the influence of place attachment on environmental concern, while Scannell and Gifford (2010a) studied place attachment as a predictor of pro-environmental behaviour. Finally, authors such as Mesch and Manor (1998) and Bricker and Kerstetter (2000) specifically looked at the effects of background variables on place attachment. As such, the conceptual model behind many place attachment studies could be visualised as in Figure 2.8. Note that place attachment is often treated as a predictor of concrete attitudes, and as such considered to be a somewhat more abstract concept.

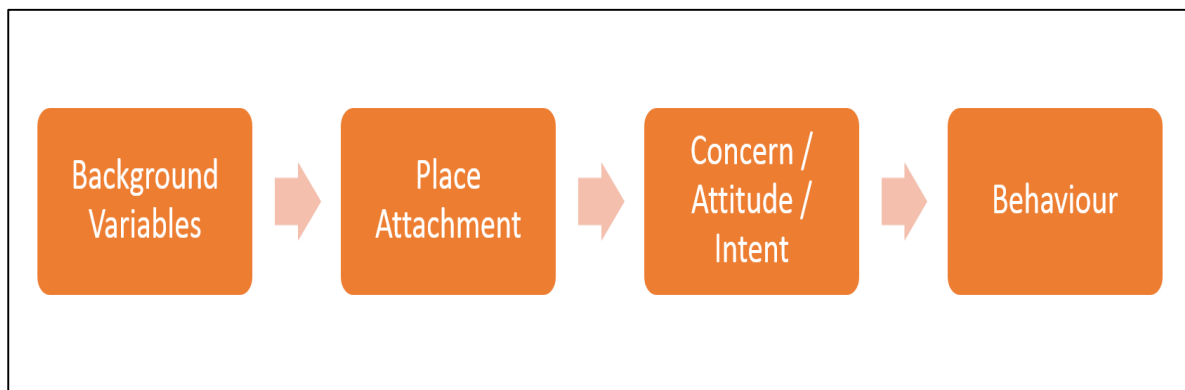


Figure 2.8: conceptual model of many positivist place attachment studies

In papers on Visions of Nature, some different models can be identified. The psychological literature on environmental values makes use of models such as Schwartz’s norm-activation model, which explains behaviour through awareness and a sense of responsibility (e.g. Stern et al., 1993), or especially of ‘values → attitudes/beliefs → behavioural intent’ models such as Ajzen’s theories of reasoned action and planned behaviour (e.g. Stern & Dietz, 1994; Kaiser et al., 1999; Schultz & Zelezny, 1999; Winter, 2007). These models are similar to the place attachment model discussed above.

Regarding Images of Nature, Buijs (2009b) and Buijs et al. (2008) noted that views of nature influence perspectives of and attitudes towards the environment, with Buijs (2009a) describing these views of nature as “mental frameworks of values, beliefs, and value orientations that direct and structure the understanding and perception of nature” (p. 420). Regarding the comprehensive Visions of Nature of interest in this study, Van den Born (2007) described them as partly subconscious worldviews, collections of values and beliefs that act as perceptual filters; as such, they are not meant as a concept to predict behaviour (p. 11-12). De Groot (2010) captured this definition of Visions of Nature as follows: “Every individual has thoughts on how we should relate to nature and on our place in it. We might not think about it regularly or in depth, but we all make

assumptions on the issue” (p. 12). As such, Visions of Nature, like place attachment, seem to be on a higher level of abstraction than more concrete beliefs or attitudes.

Having now arrived at the end of the literature review, the conceptual model underlying this study is presented in Figure 2.9:

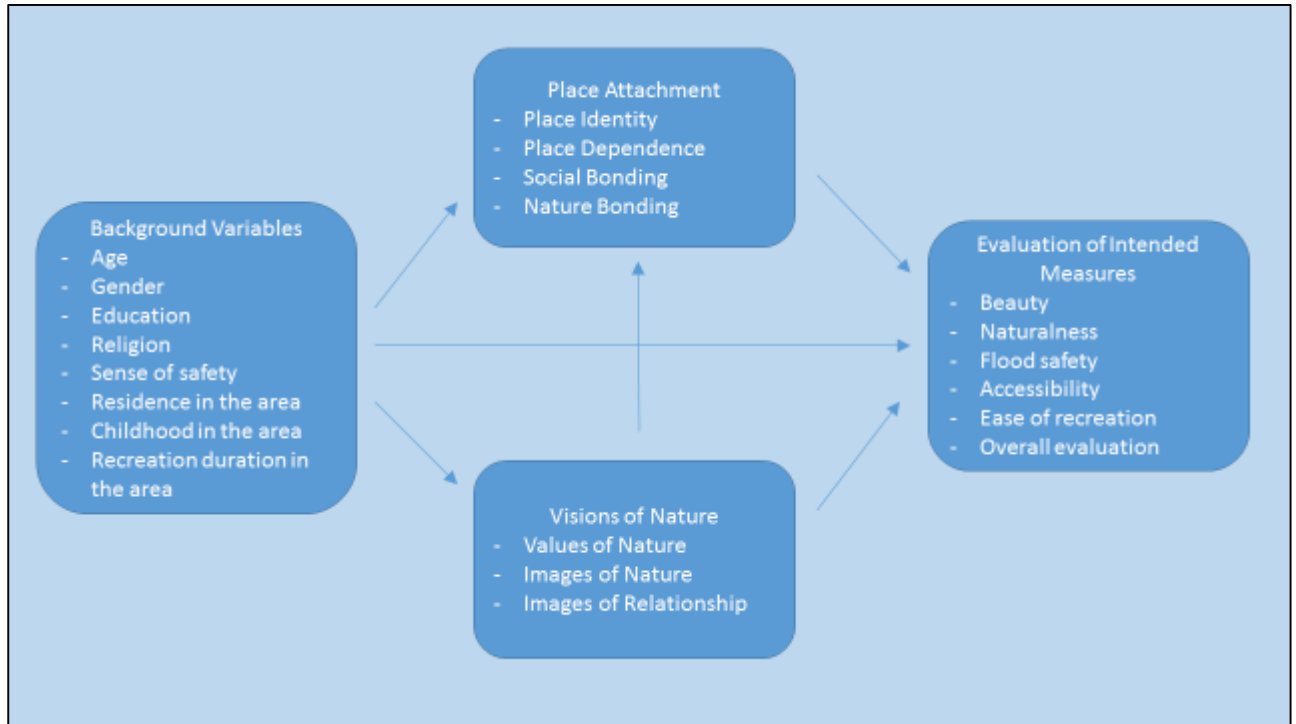


Figure 2.9: Conceptual Model

As shown in Figure 2.9, we will investigate recreationists’ Visions of Nature and place attachments (research questions 1 and 2), the influence of Visions of Nature on place attachment (research question 3), respondents’ evaluations of the intended measures (research question 4), and the influence of Visions of Nature, place attachment and background variables on these evaluations (research question 5). In addition, the conceptual model shows that we will look at the effect of (some) background variables on place attachment and Visions of Nature. The dimensions of place attachment are those arrived at in paragraph 2.1.3, the dimensions of Visions of Nature have been discussed at length in paragraph 2.2, and the background variables have been discussed in paragraph 2.3.1. As for the evaluation dimensions, these were largely based on an earlier study into local residents’ evaluations of the intended measures.

In Chapter 4 these different dimensions will be operationalised, including a presentation of the survey items used to measure them. Before we move on to our research design, however, Chapter 3 will first discuss some of our epistemological and methodological reflections.

Chapter 3: Methodology and Epistemology

Before we discuss the research design of this study in Chapter 4, this chapter will first delve into the murky waters of philosophy of science. While discussions on research paradigms are not usually included in a thesis, it was deemed pertinent to include such a section here because this research project makes use of both qualitative and quantitative methods. As will be discussed below, mixing these methods also implies mixing two distinct paradigms, which is a topic that merits further reflection. Paragraph 3.1 will first discuss the Paradigm War and mixed methods in general, while paragraph 3.2 will reflect on ontological and epistemological elements of our research objects: nature, places, and the perceptions thereof.

3.1: On Paradigm Wars and Pragmatism

We start this paragraph with a short introduction on the concept of the War of the Paradigms and what it implies for mixed methods research, after which we discuss several perspectives on how it could be resolved. Taking into consideration that the books written on this topic could fill several libraries, a thorough discussion is understandably beyond the scope of this paragraph. Nevertheless, we will attempt to provide a concise reflection on the subject matter.

A good source to start with is Guba and Lincoln's (1994) seminal work on paradigmatic differences. The authors noted that a more quantitative paradigm, with positivism as a guiding philosophy, was criticised by the constructivist school associated with qualitative methods. Denscombe (2008) noted that this critique gained prominence roughly around the mid-1970s (p. 271). In the terminology of Guba and Lincoln (1994, p. 109), positivism distinguishes a 'real world' out there independent from human perception (ontology of *naïve realism*) that can be approached through the lens of 'true' findings (*objectivist* epistemology), whereas constructivism distinguishes several 'realities' that are all true for the individual perceiving them (ontology of *relativism*), with findings being constructed by the researcher dialectically with their observed realities (*subjectivist* epistemology). The two schools have different goals as well; while positivist studies largely aim to detach their object of study from the local context in order to quantify and generalise findings, constructivist studies revel in this local context in order to present rich descriptions of the individual and particular that make little claim to be generalizable.

In addition, what we look for in our objects of study differs between the two schools: positivism has a strong orientation towards finding laws and causal patterns, whereas constructivism is more interested in relationships. Moses and Knutsen (2012) use Wilhelm Dilthey's terminology by referring to these goals as *erklären*, "to explain ... in terms of cause and effect", and *verstehen*, "to understand ... in terms of relationships" (p. 188). Not only are *erklären* and *verstehen* associated with the positivist and constructivist paradigm respectively, they can also be linked to the natural and social sciences respectively (Moses & Knutsen, 2012, p. 187-188). This ties into a larger discussion on whether there are laws or objective 'social facts' in the social world like there are in the natural world; Durkheim argued that these objective social facts existed and were to be

sociology's object of study (Moses & Knutsen, 2012, p. 35), while authors such as Giddens rejected this ontological realism and emphasised the subjective nature of social 'facts'.

It should be emphasised that positivism and constructivism are two ideal types, and as such ought to be interpreted as the two extremes on a sliding scale (Moses & Knutsen, 2012, p. 7). For instance, Guba and Lincoln (1994) supplemented their typology by including postpositivism as a more nuanced form of positivism, and critical theory as a more realist version of constructivism. Another example is the distinction made by Johnson and Onwuegbuzie (2004) between strong ontological relativism, the idea noted above that there are multiple *realities* that are equally viable, or weak ontological relativism, wherein people hold different *perspectives of reality* that ought to be examined and respected (p. 16).

While methods and paradigms are separate concepts, the positivist paradigm is more commonly associated with quantitative approaches such as statistics, while the constructivist paradigm is oriented towards qualitative methods such as narratives and thick description. As such, using mixed methods like we do here implies combining elements of the generalizability and context separation of positivism with the attention to values and local contexts associated with constructivism. But can these two research paradigms be combined, and if so how?

Those who answer 'no' to the first question adhere to the 'Incompatibility Thesis', which in the words of Johnson and Onwuegbuzie (2004) implies that "qualitative and quantitative research paradigms, including their associated methods, cannot and should not be mixed" (p. 14). As touched upon at the start of this paragraph, such incompatibility could be argued to exist on both the ontological as well as the epistemological level. Ontologically the ontologies of realism and relativism differ markedly regarding their conception of the nature of reality: positivists recognise an independent reality 'out there', constructivists see an infinite number of equally viable realities based on whoever observes. On the level of epistemology the incompatibility surrounds the question on how the single or multiple reality/realities of our world can be observed. Howe (1988) centres this discussion on the issue of metaphysics: positivists would pursue a method of objective observation "that is free of the interests, values, purposes, and psychological schemata of individuals", while constructivists would aim to understand (*verstehen*), for which subjective values are crucial. There are also apparent incompatibilities regarding the issue of context and generalizability: it seems difficult to aim for generalizability while revelling in the particular at the same time, or to simultaneously describe and exclude the local context.

However, several authors argue that reality is more nuanced than this conflict between two ideal types might lead one to believe. Although they do not advocate the mixing of paradigms within one study, Moses and Knutsen (2012) do make the salient point that the social world might be too complex for either positivism or constructivism to handle on its own (p. 302). Howe (1985) noted that "although the distinctions between quantitative and qualitative methods ... do mark important differences, the differences do not constitute sharp, uncrossable dividing lines" (p. 10), with Howe (1988) going one step further by arguing that mixed methods are "not only encouraged, but often required" (p. 10).

If we reject the Incompatibility Thesis and aim to combine quantitative and qualitative paradigms, how then can this be accomplished on an epistemological level? Several approaches are presented in the literature, and we will discuss four of them here: unification, strategic synthesis, bridge-building, and pragmatism.

Firstly, one strategy is paradigmatic unification, or the abolition of one of the two paradigms. From this perspective one conducts mixed methods research from one of the paradigms while discounting the other. This argument is used by Howe as a call for using mixed methods from a constructivist perspective. Howe (1985) argued that since qualitative concepts lie at the basis of quantitative methods anyway, and since our belief systems are based on qualitative judgements, the positivist paradigm has little merit (p. 16). The author reiterated this point in a more recent publication, where he claims that the solution is to “remove positivism from the scene—long since abandoned in philosophy—and you remove the grounds for paradigm incompatibility” (Howe, 2012, p. 93).

The second solution is what Moses and Knutsen (2012) refer to as strategic synthesis, a merger of the two paradigms. The authors illustrate this synthesis using critical realism, which merges an objectivist ontology (positivism) with a subjectivist epistemology (constructivism). According to this paradigm, there is a Real World ‘out there’, but this reality differs from the multi-layered and subjective everyday reality that we experience (Moses & Knutsen, 2012, p. 303). From this perspective of weak ontological relativism, a mixed methods investigation would thus acknowledge an independent ‘reality’ wrapped in subjective ontological layers. This, however, is also why Moses and Knutsen criticise this paradigm: in assuming a Real World, they argue that critical realism underestimates the complexity of the social world. For these authors, critical realism does not so much aim to bring together positivists and constructivists, opting instead for “burying the ontological divide” (Moses & Knutsen, 2012, p. 304).

The third solution is the one advocated by Moses and Knutsen (2012), referred to as bridge-building. From the bridge-building perspective researchers do not aim to merge the paradigmatic assumptions like in critical realism, but they opt instead to be duly aware of their own paradigm while still employing methods from ‘across the divide’. This fits in with the authors’ argument that quantitative and qualitative methods do not have to be limited to positivist and constructivist paradigms respectively, and bridge-building reinforces their suggestion that “these approaches belong in both camps, and it makes little sense to limit their appeal to just one side of the methodological divide” (Moses & Knutsen, 2012, p. 312). It should be clear that this approach could work well with a mixed-methods approach, as it allows the employment of quantitative and qualitative methods while being securely grounded in one of the paradigms. While this approach promotes the mixing of *methods*, the mixing of *paradigms* is discouraged.

The three previous solutions all share one common assumption: that paradigmatic debates are vitally important and ought to inform method use. The last perspective presented here differs in this regard: we close this paragraph with a discussion of the pragmatic paradigm, which has become associated with mixed methods research. The paradigm of pragmatism can be succinctly

summarised as aiming for ‘what works best’; in other words, the objects of research and the research questions are what determine the methods employed (Tashakkori & Creswell, 2007, p. 207), and “the lines between philosophical theory (epistemology) and research practice (methods)” are much less pronounced (Howe, 1988, p. 15). From a perspective of pragmatism philosophical discussions are given much less prominence; indeed, Johnson and Onwuegbuzie (2004) referred to pragmatism as an “anti-philosophy” that “prefers action to philosophizing” (p. 18), and argued that it “offers a practical and outcome-oriented method of inquiry that is based on action” (p. 17). In fact, Howe (1988) argued that a paradigm “is valuable just to the extent that it helps shape practice” (p. 15); in his view the debate had been dominated by “abstract epistemology as a tyrant” that forced methods to strictly comply with a set of presupposed epistemological constraint, while the author took a pragmatic perspective by arguing that methods and paradigm influence *each other* (Howe, 1988, p. 15). By shifting emphasis from abstract philosophy to concrete methods, Howe claimed that qualitative and quantitative methods could be used in a collaborative rather than a confrontational fashion.

The advantages of a pragmatic paradigm for informing mixed methods research is clear; by moving the emphasis from reconciling two warring abstract paradigms to combining concrete methods, the discussion can indeed focus on ‘what works best’ for the object of research at hand. As convenient as it is, however, pragmatism is not without its faults. Two critiques are briefly discussed here. Firstly, a practical issue raised by Denscombe (2008) is that the term ‘pragmatism’ risks raising the suggestion that there are no rules for good and bad conduct of research, in other words that “anything goes” (p. 274). This is clearly not what is meant, as ‘what works best for answering this research question’ still requires careful consideration.

A more philosophical concern, however, is that pragmatism is too hasty in sidestepping ontological and epistemological debates. Johnson and Onwuegbuzie (2004) argued that pragmatism neither can, will, nor should result in a retirement of the philosophical debates surrounding reality and how we can observe it (p. 17), and that while “many come to pragmatism looking for a way to get around many traditional philosophical and ethical disputes” it has not proven itself as an answer to these age-old debates quite yet (p. 19).

In conclusion, four responses to the paradigmatic issues surrounding mixed methods approaches have been briefly discussed here: dropping one of the paradigms, merging them, building bridges between them, or moving the discussion away from them. In the next paragraph we will discuss some ontological and epistemological reflections on our objects of study, so that we can reflect on our own position in this debate. It should be emphasized that we of course do not expect to resolve any of these longstanding debates here; rather, we want the reader to gain insight into our thoughts on this complicated topic.

3.2: Reflections on Ontology and Epistemology

We will reflect here on our ontological and epistemological beliefs about the objects of our study; in other words, do we consider place attachments and Visions of Nature to be determined by a Real World ‘out there’, and thus possibly generalizable outside of specific contexts, or do we consider them to be mental constructs unique to the individual?

The term ‘Visions of Nature’ should already signify that this theory is at the very least not fully positivist; there are several visions (plural), and as discussed in the previous chapter what constitutes as nature differs significantly between people. Attachments to place, too, could be construed as being personal mental constructs, and as such not generalizable beyond the individual. Indeed, some of the place attachment authors have such a starting point; Manzo (2005) called for the consideration of “a diversity of places and experiences, context and meaning, reflecting the dynamism of our relationships to places” (p. 70), and Kyle and Chick (2004) reflected on the highly personal narratives of their interviewees. In the field of environmental philosophy too there are authors who take a strongly constructivist stance, such as Macnaghten and Urry (1999) who discussed nature as being contested and invented. From the field of discourse analysis Hajer and Versteeg (2005) argued that “nature is not something ‘out there’, but a culturally appropriated concept, a norm, a counter-image, a memory, a Utopia” (p. 178).

The fact that context is important, and that there are strongly constructed elements to place attachments and Visions of Nature, is not debated here. What is debated, however, is that these concepts are *fully* socially constructed, and that the physical context in no way delimits these mental constructions. Indeed, Stedman (2003) argues for a more nuanced picture:

Is there an ultimate limit, set by the physical environment itself, to this “constructed landscape” approach? Are we really likely to attribute “wilderness” meanings to a suburban shopping mall? I suggest that these symbols are at least partially based on some material reality. In so doing, I am not arguing a determinism, but rather an empirical investigation into the relationship between aspects of the physical environment, and its meanings. (p. 673)

This perspective resonates with the paradigm of critical realism discussed in the previous paragraph. Indeed, both Davies (2006) and De Groot (2010) took this paradigm as their starting point by emphasising that people’s Visions of Nature, though contextual and diverse, are still grounded in at least some Nature independently existing ‘out there’ (Davies, 2006, p. 101). De Groot (2006) humorously argued a similar point when he noted that, while Visions of Nature are distinctly constructed by individuals, “no constructivist would agree to a bet that he would survive a collision with a tree at 100 miles an hour. Trees are real, especially for very fast constructivists” (p. 238).

What then is our paradigm for this research project? Of the four perspectives discussed in the previous paragraph, our perspective would most closely approach critical realism. Similar to

several Visions of Nature authors before us we consider Visions of Nature to be “reality-based constructs” (De Groot, 2006, p. 239): in other words, they are individually constructed but based on some ‘real’ physical nature ‘out there’. Similarly, attachments to place are highly personal, yet as argued in the quotation above by Stedman (2003) there are likely to be physical constraints to possible interpretations. This is also reflected in the conceptual model presented in the previous chapter, wherein we consider both social and physical attachments. The inclusion of the physical context already reveals that we consider there to be an effect of this natural context on the mental constructions studied; Evanoff (2005) argued that a fully constructivist stance would imply an ontological merger of the social and physical contexts, since the social would fully determine the meaning of the physical (p. 72). This, for us, goes one step too far.

Our objects of study are thus subjective mental constructions, yet these constructions are constrained by a fixed physical reality. As such, we expect there to be a limited number of possible interpretations, with patterns that can be identified. Our use of mixed methods reflects this perspective. A survey, by its very nature, objectifies reality into a set of predefined statements or typologies. The open questions in our survey, as well as the interviews conducted with some of the respondents, instead leave room for people’s own constructs and voices. The survey is used to search for the patterns and commonalities we expect to find, while the interviews instead emphasise uniqueness. As such, our choice of methods for this study reflects our ‘strategic synthesis’ of the positivist and constructivist paradigms.

Our rejection of the pragmatic paradigm largely stems from the philosophical critique discussed in the previous paragraph: as this discussion has hopefully demonstrated, we consider reflections on paradigms important, and we disagree with the pragmatic suggestion to only consider paradigms if they directly serve methods. Van den Born (2007) adopted a pragmatic perspective and chose to detach paradigms and methods; we would argue, however, that one cannot detach, say, statistical research from the conception of at least some degree of reality ‘out there’, as this lies at the core of the logic of statistical procedures. While we fully agree with Moses and Knutsen (2012) that statistics can be of great value to constructivists as well, we are sceptical as to how strong accounts of ontological relativism can be combined with statistical research.

Before we move on to the research design in Chapter 4, we close off the reflection on paradigms with some comments on generalizability. As noted before, we see Visions of Nature and place attachments as contextual and constructed largely by individuals; as such, generalizability is difficult, and we do not intend to generalise to fishermen and boaters in other regions, along other rivers, or in other countries. Studies such as De Groot and Van den Born (2007) and Hunka et al. (2009) on Visions of Nature, as well as the international diversity of place attachment studies, indicate at least some agreements between Visions of Nature and place attachments between different western countries at least; however, we intend to keep our findings limited to recreationists in the specific project area.

However, if we have no interest in generalising beyond the project area, why then use a survey as well? While we make no claims to generalise beyond the context of our case study, *within* this area we feel generalisations can be employed to at least some degree. After all, if we acknowledge the constraining effect of physical contexts on the construction of meanings and interpretations, we can argue that recreationists in this specific locality will have certain shared or recurring perceptions. De Wit (2013) noted that during her research on sense of place in the American High Plains she was “keenly interested in individual passions about place, but also sought a broad rendition of the “High-Plains sense of place”” (p. 129). We take a similar approach: we are interested in the individual Visions of Nature and place attachments of boaters and fishermen along the Waal, but expect to find at least some elements of a shared perspective within these two groups, or possibly even between them. As discussed in Chapters 4 and 5, however, our sampling strategy and relatively small sample size do limit the degree to which we can generalize beyond our survey respondents.

Chapter 4: Research Design

Having discussed our more abstract reflections on our research in Chapter 3, we now move on to the concrete research design employed. We will start off with a brief discussion of design frames and complementarity/triangulation in paragraph 4.1, before discussing our sampling strategy in paragraph 4.2. We then explain the design of our survey (paragraph 4.3), followed by some comments on our interview questions (paragraph 4.4). Finally, in paragraph 4.5 we discuss how our quantitative and qualitative data were analysed.

4.1: Design Frame

This paragraph ought to discuss what type of design frame is used in this study. Firstly, we witness here the difficulty of applying ideal types to a real-life research project, especially a mixed methods study. On the one hand, this study is a cross-sectional study: it uses a survey to study two groups (fishermen and boaters along the Waal river) at the same time, in order to investigate several variables (Thomas, 2013, p. 173). On the other hand, the study has elements of a case study as well: as discussed in paragraph 1.2, it is a case study into Visions of Nature and place attachment of recreationists in the context of radical changes to the area. Especially our use of interviews provides some of the in-depth detail that is associated with the case study. Different authors use different typologies of the case study: if we use the vocabulary of Thomas (2011) we would classify it as a snapshot single case study looking at one research object, the recreationists along the Waal, at one point in time. In the terminology of Yin (2003) we would call this a holistic single case study, though it has elements of an embedded case study as well; however, while the fishermen and boaters could be interpreted as two embedded units of analysis, we generally analysed the data of both groups jointly. In addition, Yin (2003) distinguishes five rationales for the single case study: our case fits the description of a *revelatory* case, as the placement of longitudinal dams in the river is a new procedure in the Netherlands, and as such it meets the requirement that “an investigator has an opportunity to observe and analyze a phenomenon previously inaccessible to scientific investigation” (Yin, 2003, p. 42).

Secondly, a few elements of our mixed methods approach warrant further discussion. Like Van den Born (2007) we use mixed methods to achieve triangulation and complementarity (p. 158). These two objectives bear similarities but do place a different emphasis: Morse (1991) defines methodological triangulation as “the use of at least two methods, usually qualitative and quantitative, to address the same research problem” (p. 120), while Van den Born and Arts (2007) define complementarity as “examining overlapping and different facets of the phenomenon” (p. 128). In other words, triangulation approaches the same question with different methods, while complementarity uses different methods to answer different (but related) questions. We aim for both in this study: one example of triangulation would be our inquiry into place attachment, since we asked survey respondents whether they felt attached to the area, while in our interviews we asked the same question followed by the question what this attachment means exactly. An example of complementarity is our inquiry into Images of Nature: in our survey we asked respondents

whether certain types of nature are ‘real’ nature, while in the interviews we asked much more open questions such as ‘what is nature’ and ‘are humans part of nature’.

Moving on to the next issue, Terrell (2012) distinguishes three important considerations in a mixed-methods study: priority, sequence, and point of integration (p. 260). Though our study makes use of both qualitative and quantitative data, we would argue that priority is given to quantitative data, with the interview data used to add more depth and understanding to the survey responses. In the terminology of Terrell (2012), concerning sequence our study makes use of concurrent triangulation (p. 268): design of the survey and interview guide took place simultaneously, and data were collected simultaneously. As for data integration, we analysed the data separately, only bringing the two datasets together at the stage of interpreting and reporting the results. Using the style of notation practiced by Morse (1991, p. 121), this study would fall into the category QUAN+Qual: simultaneous triangulation with unequal priority.

Finally, several authors from the field of place attachment (e.g. Kyle et al., 2004b; Scannell & Gifford, 2014) and Visions of Nature (e.g. Flint et al., 2013) have called for more longitudinal studies to be conducted. On its own, this study unfortunately cannot answer this call, as we lack the resources to carry out repeated measurements within this one study. However, as discussed in Chapter 1 this study is part of a larger monitoring project, and stakeholder perceptions will be measured further down the line as well. As such, this study does contribute to longitudinal measurement of people’s attachment to the river landscape.

4.2: Sampling

This paragraph will discuss the sampling strategy employed, both for the quantitative and qualitative elements of this study. Paragraph 4.2.1 will discuss the sampling strategy for our survey, while paragraph 4.2.2 will discuss how we selected people to interview.

4.2.1: Survey Sampling

Before starting this study, we were fully aware that the local recreationists would be much more difficult to reach than local residents. Unlike residents, who can be contacted directly by drawing a sample of addresses from the municipal databases, we had no way to contact the recreationists directly. In addition, we had little idea as to how large the group was. A final complication was that especially boaters in the area often come from other parts of the country, especially from the south of the country by traveling along the Meuse river. As such, our best strategy was to enlist the help of recreational organisations. Since we created an online survey using the free web-based service LimeSurvey, we had no need to send physical surveys, and instead had a simple hyperlink to spread. While the organisations we contacted did not provide us with lists of email addresses due to privacy concerns, they did consent to spread the link to our survey among their members.

In the space of time between the 14th of April and the 6th of May, boaters were contacted using a press statement with a link to the survey, spread by several organisations. Firstly, the Watersportverbond (*Aquatic Sports Association*) sent our survey link to their local chapters in the regions of Brabant and Rivierenland, and placed an advertisement in their online magazine. In addition, our contact at the association was also involved in another aquatic sports association in the river Meuse, The Federatie Midden Maas (*Federation Mid-Meuse*), and spread the link among their members as well. These two organisations also sent out a reminder in the second week of May. The local marina of the city of Tiel also consented to place our press release on their website. Finally, we contacted the magazine Motorboot (*Motorboat*), who placed our press release on their website and in the June edition of their magazine. Unfortunately they included an incorrect web link, and as such their efforts didn't likely lead to any new respondents.

For the fishermen, a contact at the Hengelsportfederatie Midden Nederland (*Fishing Federation Mid-Netherlands*) consented to spread our press release to five local fishing groups in the region, who could in turn spread it to their members. Our initial effort, however, led to few fishermen responding. As such, we sent a reminder in the second week of May. In addition, the author contacted the five local groups personally to offer to come by during a local competition or meeting to promote the survey. Unfortunately, none of the groups took up this offer.

Finally, whenever any respondent sent us an email to ask to receive a summary of the research findings later down the line, we replied to thank them for their interest, but also to ask if they could spread the survey to any friends or family members who are fishermen or boaters in the project area as well.

As the reader could glance from this explanation, our survey strategy was a form of self-selecting sampling, with a touch of snowball sampling as well: we posted the link on as many websites as possible, hoping as many people as possible would choose to participate, while also attempting to tap into their networks by having them spread the survey around even further. As noted by Verckens (2008) both of these sampling methods are not suited for finding representative samples. As we discussed in Chapter 3 already, we were always very careful with generalisations, and generalisations beyond our research locus were never really our intention.

4.2.1: Interview Sampling

After completing the survey, respondents were given the opportunity to enrol on a list of possible interviewees; as such, this was once again a form of self-selecting sampling. This resulted in around twenty people willing to participate in an interview. In order to keep the time needed for transcription and analysis manageable, however, we decided to choose eight people to conduct a semi-structured interview with. While eight interviews might seem decidedly limited, Breman, Pleijte, Ouboter, and Buijs (2008) note that when it comes to finding out local opinions regarding river landscapes “the entire spectrum of opinions can usually be described with 8-15 interviews” (p.

125, own translation). As such, we were confident that even with a limited number of interviews we could still uncover a wealth of qualitative data.

Like De Wit (2013) our goal was to choose “as broad and varied a sample as possible” (p. 129) so that we could tap into as many different perspectives as possible. Interviewees were selected from the pool of twenty as follows. In order to represent both groups of recreationists, our first priority was to have a largely equal split between these two groups; we ended up choosing four people who identified as fishermen, three who identified as boaters, and one who identified as both. Within these two categories, we chose both people with positive as well as negative assessments of the proposed measures, once again to gain more diversity. Finally, we tried to achieve at least some diversity concerning age and gender within our sample: since most of the people who enrolled for an interview were men between the ages of 45 and 65, we also included one female respondent and two respondents at or below the age of 35.

The people who were selected for an interview were contacted on the 19th of May, and appointments were made in the following two weeks. All interviews were conducted by the author in the first three weeks of June. Four interviews were conducted at the interviewee’s home, one in the city where they lived, and one on a groyne in the Waal river. Finally, two interviews were conducted over the telephone instead, as these interviewees were unable to meet the author face-to-face. All interviews were recorded on a digital voice recorder, and lasted anywhere between 30 minutes to an hour.

4.3: Questionnaire Design

This paragraph will explain how we chose to operationalize the theoretical concepts of our conceptual model. The questionnaire was divided into seven topics: recreation background, place attachment, Visions of Nature, evaluation of the study area, evaluation of Rijkswaterstaat’s communication regarding the proposed measures, evaluation of the proposed measures themselves, and general information and closure. The questions asked about these seven topics will now be discussed in more detail.

4.3.1: Recreation Background

For this topic, we first asked respondents for how many years they have recreated in the area, which forms of recreation they participated in, and how often. For five main forms of recreation in the area (fishing, boating, walking, cycling and swimming) respondents had to indicate whether they did this daily, weekly, monthly, a few times a year, once a year, or never. In addition, they had the option to list other forms of recreation they participated in in the area. Finally, we asked whether respondents identified as fisherman, boater, or both.

4.3.2: Place Attachment

Following our conceptual model, place attachment was divided into four categories: place identity, place dependence, social bonding, and nature bonding. These dimensions were translated into a total of nineteen statements (four for place dependence, five for the others), which respondents could indicate their level of agreement on using a five-point Likert scale running from ‘strongly disagree’ to ‘strongly agree’. The statements are presented in Table 4.1:

English statement	Dutch translation as used in the questionnaire
Place Identity	
1. This river area is very special to me	Dit rivierengebied is zeer speciaal voor mij
2. I am very attached to this river area	Ik voel mij niet sterk verbonden met dit rivierengebied ¹
3. I feel this river area is a part of me	Ik heb het gevoel dat dit rivierengebied een deel van mijzelf is
4. This river area means a lot to me	Dit rivierengebied betekent veel voor mij
5. Fishing/Boating in this river area says a lot about who I am	Vissen/Varen in dit rivierengebied zegt veel over hoe ik in het leven sta
Place Dependence	
6. I would not substitute any other area for fishing/boating in this river area	Ik kan dit rivierengebied niet vervangen door een andere plek om te vissen/varen
7. No other place can compare to this river area	Geen enkele andere plek is met dit rivierengebied te vergelijken
8. I get more satisfaction out of fishing/boating in this river area than any other place	Vissen/Varen in dit rivierengebied voelt voor mij vertrouwd dan op andere plekken
9. There are no better places for the activities I like to do than this river area	Er zijn betere plekken voor mij om te recreëren dan dit rivierengebied ²
Social Bonding	
10. I feel connected to other fishermen/boaters	Ik heb een band met de andere vissers/vaarders
11. I enjoy taking my family along when I fish/boat in this river area	Ik neem graag mijn familie mee als ik vis/vaar in dit rivierengebied
12. When I fish/boat in this river area I prefer not to be alone	Als ik vis/vaar in dit rivierengebied ben ik het liefst alleen ³
13. I would like to show this river area to my (grand)children	Ik zou dit rivierengebied graag aan mijn (klein)kinderen laten zien
14. The contacts established through fishing/boating in this river area are very important to me	De contacten die ik opdoe dankzij het vissen/varen in dit rivierengebied zijn heel belangrijk voor mij

¹ Reverse coded

² Reverse coded

³ Reverse coded

Nature bonding	
15. The natural environment in this river area is important to me	De natuur in dit rivierengebied vind ik niet belangrijk ⁴
16. When I spend time in the natural environment in this river area, I feel at peace with myself	Ik voel mij tot rust komen wanneer ik tijd doorbreng in de natuur in dit rivierengebied
17. I am very attached to the natural environment in this river area	Ik voel mij erg verbonden met de natuur in dit rivierengebied
18. I would be saddened if there would be a loss of plants and animals in this river area	Het zou mij verdriet doen als er planten en dieren in dit rivierengebied zouden verdwijnen
19. I have become more interested in the natural environment in this river area since I started fishing/boating here	Ik ben mij meer gaan interesseren voor de natuur in dit rivierengebied sinds ik hier vis/vaar

Table 4.1: Place attachment scale used in this study

The place identity and place dependence items were taken from the scales used by many authors in the place attachment field, including Brown and Raymond (2007), Kyle et al. (2004b), and Raymond et al. (2010). Four items on nature bonding were taken from Raymond et al. (2010), with statement 19 added by ourselves. As for the items on social bonding, statement 14 was adapted from an item in Raymond et al. (2010), while statement 13 came from Kyle et al. (2005). The other three statements were added by ourselves. It was important for us to include statements on bonding with other recreationists (10), family members (11 and 13) and social contacts (14), to express bonding at the level of community, family, and friends respectively.

4.3.3: Visions of Nature

Once again following our conceptual model, Visions of Nature was split into Values of Nature, Images of Nature, and Images of Relationship. Regarding Values of Nature, respondents were first asked to indicate how important nature was to them, on a five-point scale ranging from 'not important at all' to 'very important'. They were then asked to pick the three most important reasons why nature is important to them from a list of options, including 'agriculture', 'recreation and tourism', 'its own sake' or 'peace of mind and relaxation'. Several of these options were adapted from Hunka et al. (2009).

For Images of Nature, we asked respondents to choose to what degree they considered a list of 15 types of nature to be 'real' nature (see Table 4.2). Respondents could indicate their choice on a four-point scale: 'strongly', 'moderately', 'slightly', or 'not at all'. As shown in Table 4.2, the items were chosen to equally represent wild, Arcadian and domesticated/functional nature, at least from the author's point of view. The items were not grouped as such in the actual survey, as we instead opted to randomise their order. This was done to prevent the respondents from answering according to the factors as the researchers intended them. The items were largely based on those used in Van den Born et al. (2001) and De Groot and Van den Born (2003), with a few items such as 'flood meadows' and 'a fishpond' added by the author based on the target audience.

⁴ Reverse coded

English item	Dutch translation as used in the questionnaire
Wild nature	
The rainforest	Het regenwoud
A swamp	Een moeras
A dandelion alongside the road	Een paardenbloem langs de weg
Weeds in the garden	Onkruid in de tuin
The Waal river	De Waal
Arcadian nature	
Cows in the meadow	Koeien in de wei
Willows alongside the river	Wilgen langs de rivier
Flood meadows	Uiterwaarden
The polder	De polder
Birds brooding in the grassland	Broedende vogels in het gras
Domesticated/Functional nature	
A football field	Een voetbalveld
A city park	Een stadspark
A fishpond	Een visvijver
Grain fields	Graanvelden
Houseplants	Kamerplanten

Table 4.2: Images of Nature items used in this study

Finally, for Images of Relationship we made use of the Human and Nature (HaN) scale developed in Van den Born (2007) and De Groot (2010). We chose eighteen statements from the HaN scale, four for the Master and Steward images and five for the Partner and Participant (Table 4.3). This choice was made partly because previous studies using this scale have demonstrated that the Master and Steward are easier to distinguish than the Partner and Participant. Once again, respondents could indicate their level of agreement on a five-point Likert scale running from ‘strongly disagree’ to ‘strongly agree’. While Table 4.3 structures the statements according to the Images of Relationship they represent, this is purely for the reader’s convenience; in the actual survey the statements were presented in a random order.

English statement	Dutch translation as used in the questionnaire
Master	
1. Human beings have the right to alter nature radically	De mens heeft het recht om de natuur ingrijpend te veranderen
2. Human beings have more value than nature	De mens is meer waard dan de natuur
3. Nature cannot be allowed to stand in the way of economic progress	De natuur mag geen belemmering zijn voor economische groei
4. Technology and science will enable us to solve environmental problems in the future	Technologie en wetenschap stellen ons in staat om milieuproblemen in de toekomst op te lossen
Steward	
5. We have to ensure that we leave enough nature intact for future generations	We moeten ervoor zorgen dat er genoeg natuur overblijft voor toekomstige generaties

6. Human beings have a responsibility to protect the natural environment	De mens heeft de verantwoordelijkheid om de natuur te beschermen
7. I feel an obligation to protect the natural environment	Ik voel mij verplicht om de natuur te beschermen
8. Human beings are part of nature and are also responsible for it	De mens is onderdeel van de natuur, en is er ook voor verantwoordelijk
Partner	
9. Humans and nature deserve to be treated as equals	Mens en natuur verdienen een gelijke behandeling
10. Humans and nature are of equal value	Mens en natuur zijn gelijkwaardig
11. Nature wants to grow and prosper, just like humans do	De natuur wil groeien en bloeien, net als de mens
12. I can have a relationship with nature just like I have with my friends	Ik kan een band met de natuur hebben zoals ik die met mijn vrienden heb
13. I would like to have a relationship with nature just like I have with my friends	Ik zou een band met de natuur willen hebben zoals ik die met mijn vrienden heb
Participant	
14. The grandeur of the natural environment enables me to experience the insignificance of human beings	In de natuur kan ik de nietigheid van de mens ervaren
15. I often feel an intense connection with nature	Ik voel vaak een intense verbondenheid met de natuur
16. When I am surrounded by nature I experience something greater than mankind	In de natuur ervaar ik iets dat de mens overstijgt
17. I sometimes feel one with the universe	Ik voel mij soms één met het universum
18. I would like to spend a week alone along the river, in order to feel one with nature	Ik zou graag een week lang alleen aan de rivier willen zijn, om mij één te voelen met de natuur

Table 4.3: Human and Nature (HaN) scale as used in this study

All these statements were taken from previous work on the HaN scale, especially Van den Born (2006), De Groot and De Groot (2009), De Groot et al. (2011) and Verbrugge et al. (2013). Each of the statements was formulated carefully to represent certain ‘triggers’ for one of the four Images of Relationship. The Master items express nature as serving mankind (1), mankind being of more value (2), dominance of the economy (3) and technological optimism (4). The Steward items signal duty towards future generations (5), general (6) and personal (7) responsibility towards nature, and humans being both equal to, as well as responsible for, nature (8). This last Steward item engages the discussion on “the dual nature of human beings” (Van den Born, 2008, p. 103). The reader might be surprised to find no reference to God in the Master or Stewardship items, even though Chapter 2 discussed the religious roots of these perspectives at length. We base this decision on De Groot et al. (2011), who argued that religious statements tend to be a trigger for general religious beliefs rather than engagement with the Images of Relationship (p. 32).

The Partnership items express equal treatment (9), value (10) and goals (11) of humans and nature, and humans and nature being in a relationship of equals (12 and 13). These last two

statements were first used in De Groot et al. (2011), and were based on findings from De Groot and De Groot (2009). The Participant items express the grandness of nature (14 and 16), the intense connection between humans and nature (15), the concept of *Unio Mystica* from the realm of deep ecology (17), and the desire to go 'back to nature' (18). Statement 18 was used by Van den Born (2006) but with forest instead of river; this was changed in order for it to resonate better with the target audience.

Finally, in order to probe the tolerance our respondents showed for human intervention in nature, we asked whether such interventions were acceptable if it improved the quality of the natural environment, increased the attractiveness of the landscape, improved flood safety, or increased opportunities for recreation. These questions were not part of the dimension Images of Relationship, but were included to see whether acceptance would differ depending on the argument used.

4.3.4: Evaluation of the Study Area

Respondents were first asked simply whether there were sufficient opportunities for recreation in the area (yes or no). Respondent were then asked to rate the attractiveness of the area for recreation, on a five-point scale ranging from 'not attractive at all' to 'very attractive'. We then asked respondents whether they have a 'special place' to recreate in the area, and if so if they could explain why this place is special to them. This question was included based on place attachment studies such as Eisenhauer et al. (2000), who discussed the importance of having a 'special place' in an area for the development of place attachment.

Finally, respondents were asked to use a five-point Likert scale to indicate their level of agreement with four statements: whether they feel that recreating in the area is safe, whether they are frequently aware that the Waal river could flood, whether they trust Rijkswaterstaat with flood protection in the area, and whether they feel personal responsibility for flood safety in the area. The first two statements reflect sense of safety, one of our background variables, while the last two engage the discussion on the role of 'the people' versus 'the government' in flood management.

4.3.5: Evaluation of the Communication

Respondents were first simply asked whether they knew what a longitudinal dam is, and then whether they knew about the placement of such dams in the project area. If they answered 'no' to this second question, they could indicate if they were interested in receiving more information at a later date, before moving on to the next topic. If they were aware of the placement of longitudinal dams in the area, however, we first asked them how they were informed about this: options included official information from Rijkswaterstaat, social media, and recreation interest groups. If they received information from Rijkswaterstaat, we also asked them whether this information felt trustworthy, on time, and comprehensive. Finally, we informed whether

respondents had actively searched for information on the longitudinal dams. We ought to note that only the first two questions of this category were used for our analysis in the next chapter.

4.3.6: Evaluation of the Measures

After introducing the longitudinal dams, including a map showing the locations and an artist's impression of a longitudinal dam as seen from a boat, respondents were asked for their impression of the consequences. Specifically, they could indicate (once again on a five-point Likert scale) whether they expected the longitudinal dams to make the area more beautiful to look at, more natural, safer with respect to flooding, more accessible, and easier to fish or boat on. We also asked respondents whether they felt placement of the dams was a good idea overall (on a five-point scale ranging from 'not at all' to 'completely agree'), and used an open question to allow them to explain why they felt this way. These questions reflected the 'evaluations' part of our conceptual model.

4.3.7: General Information and Closure

Finally, we asked a few general questions reflecting our background variables. We asked for the respondent's age, gender, and highest level of education completed. We also informed whether the respondent lives in the project area, and whether they had spent a major part of their childhood there. Finally, we asked whether respondents identified as religious, and if so as a member of which religion.

At the end of the questionnaire, respondents could indicate whether they had an interest in being interviewed at a later date, and they could submit their email address for a chance to win a prize. There was also an opportunity to submit additional comments or questions regarding the survey.

4.4: Interview Design

Considering our desire for complementarity and triangulation, our interview guide was designed to gain in-depth perspectives on some of the topics in the survey. After explaining the proceedings and asking for permission to record the interview, interviewees were asked questions on three topics: attachments to the project area, Visions of Nature, and the proposed measures. At the end of the interview, interviewees were also given the opportunity to bring up anything else they felt was relevant to the discussion.

Concerning place attachment, interviewees were asked whether they were born in the project area, and what their first memories of the area were. They were asked how they spend time in the area and with whom, what made the area beautiful to them, and whether they considered the area unique. We discussed whether interviewees felt attached to the area, whether this attachment

is continuous or recurring, and whether they also felt this attachment when away from the Waal river. Finally, we inquired whether they felt safe in the area, and if there were any negative aspects of the area.

For the topic Visions for Nature, our questions were partly based on Van den Born (2008). We first asked for the interviewees' definition of nature, whether nature was considered vulnerable, and whether human beings were a part of nature. We also discussed whether human beings were seen as having a responsibility towards nature, what this responsibility is, and whether there was a divine or spiritual element to this responsibility. We asked why nature was important for the interviewees, and tried to discuss the concept of intrinsic value with them. Finally, we probed under which circumstances human intervention in nature was considered acceptable or necessary.

For the final topic we introduced the proposed measures once again, including a map of where the longitudinal dams would be placed and an artist's impression of said dams, and inquired when interviewees first heard about the measures and what their first reaction had been. We then discussed their perspectives on and expectations of the measures, including their expected effects on water levels, access for recreationists, plants and animals, and enjoyment of the landscape. We also asked for their opinions on the communication regarding the measures by Rijkswaterstaat. Finally, we inquired whether the measures were expected to influence their attachments to the Waal, whether positively or negatively.

4.5: Data Analysis

In the final paragraph of this chapter, we will briefly discuss how our data was analysed. Paragraph 4.5.1 discusses the quantitative analysis, and paragraph 4.5.2. explains the qualitative analysis.

4.5.1: Quantitative Analysis

For our quantitative analysis, the survey responses were downloaded from Limesurvey and entered into the SPSS statistical software package, version 21. Our simplest form of analysis was descriptive statistics: we checked for the means, ranges and standard deviations of the responses, while frequency tables were often checked as well.

A more sophisticated form of analysis was factor analysis, which gives insight into respondents' own classifications. Following many of the previous studies that inspired us as discussed in the literature review, we conducted three separate exploratory factor analyses on the statements regarding place attachment, Images of Nature, and Images of Relationship. The results of these three analyses will of course be discussed in the next chapter, but they followed similar proceedings. Largely following Foster, Barkus, and Yavorsky (2006), our factor analyses were conducted as follows:

1. We started off with an unrotated factor analysis (Principle Components), and first checked whether the data was fit for a factor analysis. This was done using two methods. Firstly, we checked the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy; Foster et al. (2006) suggest taking 0,6 as the lowest accepted value (p. 75). Secondly, we checked the Correlation Matrix to judge whether any of the items had either too little or too much correlation with the others. Foster et al. (2006) argue that every item should have correlations of at least 0,3 with at least some of the other items. After all, if an item barely correlates with any of the others, it will end up being a factor on its own. The Institute for Digital Research and Education (n.d.) adds that two items should not have a correlation of more than 0,9 either, as this indicates that they have too much overlap. As such, we checked for both in the Correlation Matrix.
2. Once it was confirmed that factor analysis could be employed, we used the unrotated factor analysis as an indication of how many factors could be extracted from the data. We used two indicators provided by SPSS: the number of components SPSS could extract with an Eigenvalue greater than 1, and the number of components found above the 'elbow' in the Scree plot (Foster et al., 2006, p. 76). However, we also took the number of dimensions of the relevant theoretical concept into account.
3. Once we decided on a number of factors to extract, we conducted a rotated factor analysis while forcing SPSS to extract exactly that many factors. We chose Varimax rotation with Kaiser normalisation because, as noted by Foster et al. (2006), Varimax rotation "maximises the variance between the factors so that each factor tends to load high on a small number of variables and low on the others. This makes it easier to interpret the factor" (p. 78). We chose to suppress any coefficient with low factor loadings; Foster et al. (2006) discuss suppressing any factor loading below 0.3; however, we chose to be slightly more conservative. Our default choice was to suppress all factor loadings below 0.35, following authors such as De Groot and De Groot (2009) and Verbrugge et al. (2013), but we ended up choosing benchmarks of 0.40 or 0.45 due to overall high factor loadings.
4. Because we always ran at least two rotated analyses per set of statements, with one more or one less factor to extract, the Rotated Component Matrices were then checked to see if they were clear enough to analyse, and we judged which variant was clearest. This was done because the Scree plot did not always show a convincing 'elbow'.
5. Once we settled on our preferred number of factors, we conducted a Reliability Analysis on each extracted factor to check whether all the extracted factors were reliable. Reliability Analysis produces Cronbach's alpha, a measure of internal consistency. Though finding agreement on a lowest acceptable value for Cronbach's alpha proved difficult, based on the literature we chose to interpret $\alpha > 0.7$ as a good reliability, with $0.6 \leq \alpha \leq 0.7$ still acceptable and $0.5 \leq \alpha < 0.6$ interpreted as less reliable. Factors with $\alpha < 0.5$ were considered unacceptably unreliable.

After these steps were completed, the resulting factors of course had to be interpreted and named. This step, however, comes down to the theoretical knowledge and interpretative skill of the researcher, as SPSS can provide no standardised procedures for this.

To further the analysis one more step, we wanted to see whether adherence to certain factors was related to background variables such as age or recreation role. To check for such relations, we split respondents into two groups for every factor. For Images of Nature, respondents were split for each of the images between those who scored equal or higher to the mean degree of naturalness, and those who scored lower than the mean. For Images of Relationships we wanted to split the sample between adherents and non-adherents to each factor. The literature presented two methods for achieving this: De Groot and van den Born (2003) and Van den Born (2006) chose to count a respondent as adherent to a factor if they chose 'agree' or 'strongly agree' for all items in that factor, while De Groot and Van den Born (2007) and De Groot (2012) chose to count every respondent with a mean degree of adherence of at least 1 (on a scale from -2 to 2) as adherent to a factor. We chose to use this second approach, as the disadvantage of the first method is that if respondents agree with all statements in a factor except one, they are immediately disregarded as adherent. We used the same method in our place attachment analysis, in order to distinguish people who agree with a factor and those who do not.

These dichotomous variables, high or low score on a factor, were then entered into a contingency table along with background variables such as gender or recreation duration, which were recoded into categories if necessary. The significance of Pearson's Chi-square provided an indication of whether statistically significant relations existed. We took $p \leq 0.05$ to be an indication of statistical significance. A similar procedure was followed for determining the effects of different variables on the evaluation of the intended measures.

4.5.2: Qualitative analysis

For the analysis of our interview data, all interviews were transcribed verbatim and uploaded into Atlas.ti, a programme that allows the researcher to apply codes to passages in text documents in order to conveniently relate passages from different documents to each another. For this project, a three-step coding procedure was followed. For step one, all interview transcripts were coded individually, which involved applying codes to all passages that the author considered relevant. The code names were drawn largely from themes discussed by the interviewee, and not yet connected to theoretical concepts. For instance, a passage about an interviewee's lack of religious beliefs regarding the human-nature relationship was coded with 'no role for religion'. Once this was done for all interviews, the second step involved going back through all the interviews to merge similar codes and give them more accurate names. Since the first round of coding inevitably resulted in a long list of codes used only once, this second step was intended to improve the correspondence between similar passages. The third and final step of the coding procedure consisted of constructing code families reflecting the different dimensions of our theoretical concepts (e.g. 'Nature bonding' or 'Sense of safety'), and placing all relevant codes in these families. For instance, the aforementioned code 'no role for religion' was added to the family 'Images of Relationships'. This allowed us to bring up a list of all passages about a certain theoretical concept, and quickly scroll through all the relevant quotations. Note that some codes were added to more than one family; for instance, the code 'humans are separate from nature' was added to the families 'Images of Nature' as well as 'Images of Relationships'.

Chapter 5: Results

The presentation of this project's results will be split into four parts, reflecting our research questions (RQs) and conceptual model. After introducing the characteristics of our survey respondents in paragraph 5.1 their Visions of Nature will be discussed in paragraph 5.2 (RQ1), followed by their attachments to the project area (RQ2) as well as the relationship between these attachments and Visions of Nature (RQ3) in paragraph 5.3. In the final paragraph 5.4 their evaluations of the groyne removal and longitudinal dams will be discussed (RQ4), as well as the relationships between their views on the measures and their place attachments, background variables and Visions of Nature (RQ5).

5.1: Sample Characteristics

Our survey yielded 76 completed questionnaires; we ended up removing one due to occurrence of straight-lining⁵. This resulted in 75 useable responses. Table 5.1 provides some descriptive statistics, while also showing some of the categories we use for the contingency tables later in this chapter. Ages ran between 22 and 79 years old, with a mean age of 56.99 years old. More boaters than fishermen completed the survey, and it is notable that respondents were mostly male, with only 5.3% being female. Regarding religious beliefs, almost half our respondents do not identify as religious, with the largest religious group consisting of Catholics (25.3%).

On the subject of the project area, only 18.7% live along the Wamel-Ophemert

	Frequency	Percentage
Gender		
Male	71	94.7%
Female	4	5.3%
Age		
59 or younger	40	53.3%
60 or older	35	46.7%
Recreation role		
Fisherman	25	33.3%
Boater	44	58.7%
Both	6	8.0%
Recreation duration in the area		
Up to 15 years	38	50.7%
16 to 30 years	21	28.0%
31 years or more	16	21.3%
Highest level of education		
Primary school	5	6.7%
Lower vocational/secondary school	17	22.7%
Middle vocational/secondary school	30	40.0%
Higher vocational or university	23	30.7%
Living in the area		
Yes	14	18.7%
No	61	81.3%
Childhood in the area		
Yes	14	18.7%
No	61	81.3%
Religion		
Protestant	5	6.7%
Catholic	19	25.3%
None of the above	1	1.3%
Not religious	37	49.3%
No answer	13	17.3%

Table 5.1: Some descriptive statistics of our sample

⁵ Straight-lining occurs when a respondent gives identical answers to a series of questions, in other words picks the same answer in a 'straight line' from top to bottom. This is often used as an indication of 'bad respondents'

trajectory, and just as many people spent a major part of their childhood there. Interestingly, these were not always the same people; some had evidently moved out of the area or come to live there later in life. The number of years people have recreated in the area differed markedly; the mean was 20.09 years, with responses running from 2 to 70 years.

Regarding recreation activities, the most popular was boating, with 73.3% of respondents boating at least once a year. In descending order of popularity, respondents also spent at least one day a year walking or cycling (57.3%), fishing (48%) and swimming (24%). Interestingly, though fishing thus seems less popular than boating among our respondents, it does seem to be a more frequent activity: people largely went boating a few times a year, while a majority of the people who fished did so weekly or monthly. Other recreational activities included social visits, photography, visiting the city of Tiel, or simply relaxing along the river.

With a mean score of 0.51 on a scale from -2 to 2, respondents were overall moderately positive about the attractiveness of the area for recreation. When asked whether they had a special place in the area, 30 respondents noted they did. Interestingly, 22 of these respondents were fishermen. As we expected, it seems fishermen are much more likely to develop a special place in a recreation area than boaters; in line with Eisenhauer et al. (2000) we would expect this to contribute to increased place attachment. Regarding safety of the area, respondents on average regarded the area safe for recreation (0.59), though 42.7% of our respondents agreed or strongly agreed that they were frequently aware of flood risk along the Waal river. Respondents on average trusted Rijkswaterstaat for securing flood safety in the area (0.67) and disagreed that as a recreationist they carried personal responsibility for flood safety (-0.15).

Before we move on to the next paragraph, we feel compelled to bring up the issue of generalisation again. In Chapter 3 we already discussed our intent to keep our conclusions limited to the project area, and not to generalise onto larger populations. We are obliged to note here that it is nearly impossible for us to check whether our sample is representative of recreationists in this area. For instance, our sample contains more boaters than fishermen; it is not known how many boaters and fishermen recreate in this area, and it is thus impossible to know if this accurately reflects the larger population. Our sample is also strongly skewed towards men, yet earlier research by Filius et al. (2000) cited national data that held the percentage of male fishermen at 93% (p. 19); this would indicate that the gender bias in our sample might actually make it an accurate reflection of the population. All in all, we are careful with generalisations beyond our survey respondents, as we cannot ensure that our sample is representative. The issue of sampling bias will be discussed further in the reflection in Chapter 6.

5.2: Visions of Nature

This paragraph discusses the Visions of Nature of our respondents. In order, their expressed Values of Nature, Images of Nature, and Images of Relationship are discussed. The paragraphs discuss both the results of our quantitative and qualitative analyses.

5.2.1: Values of Nature

Respondents were asked how important nature is to them, on a five-point scale running from 1 (not important at all) to 5 (very important). Our respondent clearly value nature very much: the lowest score was 3 (neutral), and 94.7% of our respondents noted that nature was important or very important to them, being about evenly split between the two. Mean score on the five-point scale was 4.41, with a standard deviation of 0.595. In order to check whether this valuation differed among groups, we split the sample between those who chose 'very important' ($n = 35$) and those who chose 'important' or 'neutral' ($n = 40$). After entering this new variable into a contingency table with some background variables, it was revealed that the only statistically significant relation was that those who consider nature 'very important' were more likely to have recreated in the area for up to 15 years ($p = 0.044$).

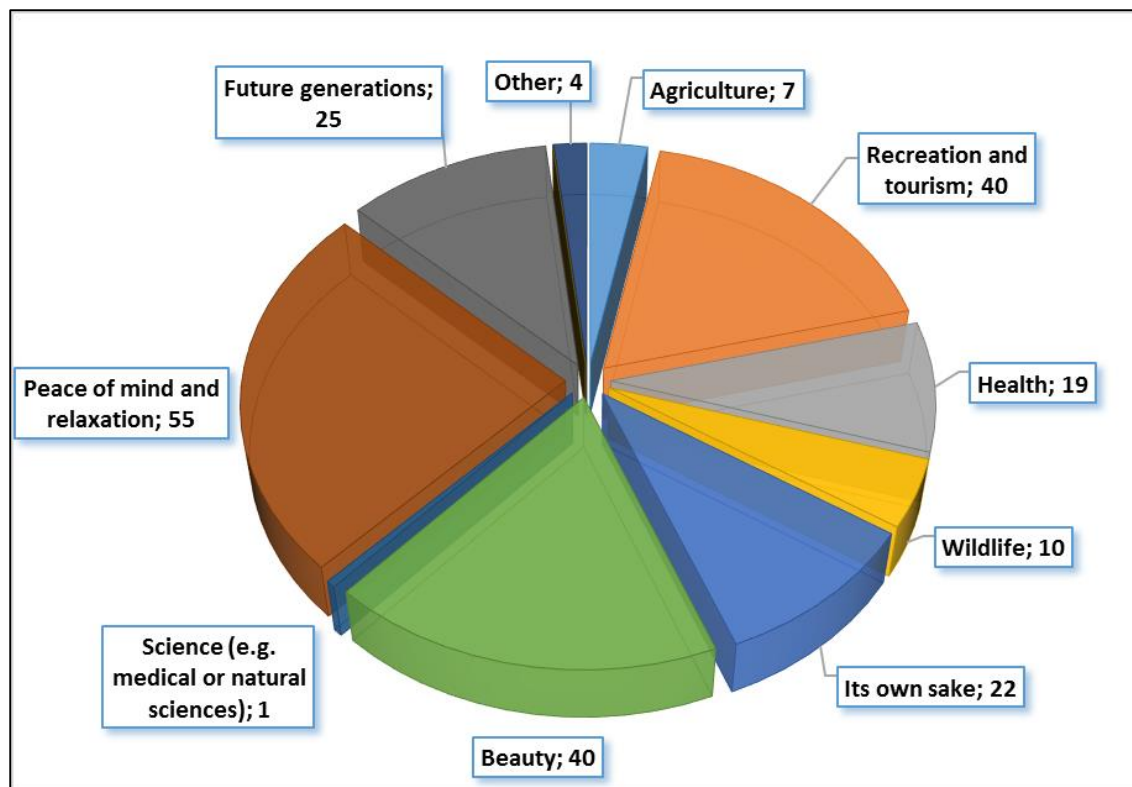


Figure 5.1: Values of Nature. The numbers represent the amount of respondents who chose that option as one of their top three Values of Nature

It is one thing to ask someone if nature is important to them, but asking them why it is important is quite another. Figure 5.1 shows the options we gave respondents to choose from, and the number of times each option was chosen as a top three Value of Nature. The results are quite different from Van den Born et al. (2001): our respondents overwhelmingly chose relaxation, beauty and recreation as the main Values of Nature. This is of course not surprising, as our sample consists of recreationists who seek out a natural area for their enjoyment, and in our survey we addressed them specifically as recreationists. Indeed, these values were articulated often in our interviews as

well. Interviewees often referred to the beauty of the natural landscape, and the importance nature has in allowing them to unwind when recreating:

You see so much beauty, the whole week you are stressed out because of work and obligations. And in the weekends you relax, and I enjoy nature⁶ (F1)⁷

On the other hand, the value of nature for human health was a much less popular option, despite being the most often chosen value in Van den Born et al. (2001). During the interviews, only two interviewees discussed this value: one of them noted that plants produce vital oxygen (F3), and another noted that our reliance on water and agricultural produce means that “nature can exist without humans, but humans cannot exist without nature” (B2).

Our respondents’ emphasis on valuing nature for recreation and relaxation might help to explain why intrinsic value, phrased here as ‘its own sake’, was less popular than in Van den Born et al (2001). Our interviewees rarely brought up intrinsic value on their own, as their first impulse was to emphasise its recreational value. When we tried to discuss intrinsic value with our interviewees, like Van den Born (2008) we found that people struggled with the notion. Once we tried to explain the notion by describing a natural area that was closed off to people, however, response was mixed. Three interviewees reacted negatively, noting that nature really ought to be accessible to humans. One of them wondered “but, then for whom are you saving it?” (B2). One interviewee did note that it is important to preserve certain natural areas, but gave this intrinsic valuation an instrumental twist by noting that this created a valuable sense of mystery (F2). In other words, preservation was seen as being an excitable feeling for humans. Another interviewee, however, argued that animals will appreciate and value having some areas where they can be at peace (FB1), which in the terms of Morito (2003) is an objectivist approach to intrinsic value. Two interviewees also mentioned the concept of a ‘circle of life’ which we are all part of, with one of them noting that this is not so much a value of nature as much as its purpose (F1). This idea of a ‘circle of life’ is what Lockwood (1999) would call ecocentric thinking.

5.2.2: Images of Nature

Our data were deemed suitable for a factor analysis: overall correlations were rather low, but the KMO-measure was acceptable at 0.710. SPSS could extract up to 5 factors with eigenvalue greater than 1, while the Scree plot showed an ‘elbow’ at 2 factors. We conducted a rotated factor analysis with 3 and 4 factors, and ended up choosing the three-factor rotation to reflect our tripartite model of wild, Arcadian and functional nature, and also because the four-factor model was much less clear. The 3 factors explained 52.057% of the variance. Due to overall high factor loadings, we chose to suppress any factor loading below 0.45. The results of the analysis are shown in Table 5.2.

⁶ Since the interviews were conducted in Dutch, all direct quotations are translations by the author

⁷ These codes represent the interviewees, with F1-F4 being the fishermen, B1-B3 the boaters, and FB1 the interviewee who identified as both

Functional nature	Factor loading	Mean degree of naturalness	Standard deviation of mean degree
Cows in the meadow	.758	3.17	.844
Houseplants	.742	1.96	.892
A city park	.705	2.27	.827
The polder	.675	3.27	.827
Grain fields	.648	2.48	.875
A football field	.636	1.36	.690
A fishpond	.604	2.01	.979
Mean degree of naturalness (Functional)		2.36	.587
Cronbach's alpha	.815		
Wild nature			
Willows alongside the river	.748	3.52	.704
The rainforest	.648	3.87	.502
Birds brooding in the grassland	.604	3.72	.583
Flood meadows	.591	3.64	.536
A swamp	.482	3.59	.699
Mean degree of naturalness (Wild)		3.67	.397
Cronbach's alpha	.661		
Penetrative nature			
Weeds in the garden	.854	1.96	.936
A dandelion alongside the road	.795	2.83	.906
Mean degree of naturalness (Penetrative)		2.39	.802
Cronbach's alpha	.682		
Excluded from the factors:			
The Waal river		3.68	.573

Table 5.2: Factor analysis of Images of Nature. Items are listed per factor in descending order of factor loadings, where factor loadings indicate how well an item fits into the factor. Mean degree of naturalness is the average association with real nature, running from 1 ('not at all') to 4 ('strongly')

The first factor, with a high Cronbach's alpha ($\alpha = 0.815$), includes all five functional nature items. It also includes two items originally conceived by the author as Arcadian, the cows in the meadow and the polder. Though these two items have a higher mean degree of naturalness than the other items in the factor, they do have a functional element: the image of cows in the meadow could be associated with agriculture, while polders are decidedly 'unnatural' landscapes in the sense that they are the result of human intervention in nature. These arguments, combined with this factor having the lowest mean degree of naturalness (2.36), led us to call this factor 'Functional nature'.

The second factor has a lower Cronbach's alpha ($\alpha = .661$), and stands out because of its high mean degree of naturalness (3.67). It includes two of the original wild nature items, the swamp and the rainforest, as well as three original Arcadian ones. These three items are much less functional, however, as willows alongside the river and birds brooding in the grassland especially are wilder elements of the river landscape. Flood meadows are somewhat more functional in the sense that they are used for water management; however, flood meadows are also cherished natural areas.

Indeed, one interviewee (B3) specifically noted the wildlife and untouched nature in the flood meadows as being an important draw of the river landscape. These considerations led us to interpret this factor as 'Wild nature'.

The third and final factor contains only two items, which were originally conceived of as forms of wild nature. Though it is preferable to have at least three items per factor, Cronbach's alpha is acceptable ($\alpha = .682$). In addition, these two items very clearly reflect the Image of Nature that De Groot and van den Born (2003) termed 'penetrative nature'. Both weeds in the garden and a dandelion alongside the road are forms of nature that pop up in otherwise man-made locations. As such, we chose to interpret this factor as 'Penetrative nature'.

Overall, it is interesting to note that our respondents did not reproduce our original tripartite model of wild, Arcadian and functional nature. Instead of conceiving of a separate Arcadian nature, the Arcadian items were split between two more functional ones and three wilder ones. The separate penetrative Image of Nature, which we did not include in our original model, was clearly recognised by our respondents. In addition, the only item that did not fit into any of the three factors was 'the Waal river'. This could be explained by noting the different roles of the river, being a natural area, a recreation area, as well as an important traffic route for the shipping industry. In addition, 'the Waal river' is less specific than 'flood meadows' or 'willows alongside the river', which invoke more concrete images⁸. Though it did not fit into any factor, the item has a high mean degree of naturalness (3.68), meaning respondents mostly classified it as a form of 'real' nature.

As a final step, we checked for the relationship between respondents' scores on these factors and some of the background variables in Table 5.1. For each factor we split respondents between those who scored equal or higher to the mean degree of naturalness, and those who scored lower. The contingency table showed that respondents' gender, religion, recreation role and recreation duration in the area were all not significant. Those respondents who assigned an average or higher degree of naturalness to functional nature were relatively often found in the age category 60 years of older ($p = 0.001$) and tended to have a lower level of education ($p = 0.031$).

In our interviews we also asked what people consider to be 'real nature'. Like in Van den Born (2008), the major element that was brought up here was human involvement. Real nature was often described as "letting nature run its course" (F2) and as nature organising itself (FB1), which would help explain the high degree of naturalness ascribed to our wild nature items. Interestingly, one interviewee referred to a man-made swamp area near the Waal river, yet he felt it exemplified real nature because "they leave it to grow (...) There are some wild horses, and aside from that no one comes there" (FB1). Several interviewees also noted that real nature is vast and tranquil. While most described specific types of landscapes, two interviewees stood out because they described nature as "everything, flora and fauna" (F1) and as "real life" and "a type of balance, an equilibrium" (F4). These two interviewees seem to have both a broader and more abstract Image of Nature.

⁸ The author would like to thank Mirjam de Groot for bringing this to our attention

Regarding the question whether humans were a part of nature or not, we saw a similar response to those described in Van den Born (2008) and De Groot and Van den Born (2007). Specifically, while some interviewees described human society as “artificial” and separate from nature (F4), several noted that humans were part of nature, but only if they acted in an appropriate manner:

Q: And are humans a part of nature?

A: Yes, I think so. We are a part of, especially if you (...), if you act a bit as such I think

Q: Right, but if humans just live in the city, are they then nature as well?

A: No, I think that, no that's something else (B1)

One discussed element of this appropriate manner was not to pollute natural areas (B2). On the other hand, one interviewee noted that humans are just as much part of nature as other fauna, and merely think they are separate (F1).

Finally, we asked whether nature was vulnerable or not. Opinions on this matter differed markedly. Some interviewees noted that nature is highly resourceful (B2), that nature will still be there long after humans will be gone (F2), and that nature can take care of itself (F3). On the other hand, several interviewees also brought up that human actions can cause significant damage to nature, which frames nature as something fragile. Interestingly, interviewees were not always consistent: one of them first noted that nature is a delicate balance that could collapse due to the slightest human intervention, yet afterwards argued that nature will find its way regardless of whether there are humans or not (F1).

5.2.3: Images of Relationship

With good overall correlations and a KMO-measure of 0.762, our data was fit for usage in a factor analysis. Like with Images of Nature, SPSS could extract up to 5 factors with eigenvalue greater than 1. Since the scree plot did not show a convincing ‘elbow’, and since previous publications on Images of Relationship tended to go with 4 of 5 factors, we chose to run a rotated factor analysis with 3, 4 and 5 factors. Of these, we ended up going with the three-factor model. This choice was made because the rotation with 4 and 5 factors included one factor consisting largely of items placed in other factors as well, while the five-factor model also included a factor with only 1 item. The three-factor model explained 57.546% of the variance. Only factor loadings of at least 0.40 were taken along in the analysis, the results of which can be seen in Table 5.3.

	Factor loading	Mean level of adherence	Standard deviation of mean level
Guardianship of nature			
St Human beings have a responsibility to protect the natural environment	.877	1.35	.762
St I feel an obligation to protect the natural environment	.844	1.07	.759
Pr Nature wants to grow and prosper, just like humans do	.832	1.12	.753
St We have to ensure that we leave enough nature intact for future generations	.792	1.53	.704
St Human beings are part of nature and are also responsible for it	.767	1.17	.742
Pt The grandeur of the natural environment enables me to experience the insignificance of human beings	.608	0.95	.868
Pt I often feel an intense connection with nature	.587	0.79	.890
Pt When I am surrounded by nature I experience something greater than mankind	.517	0.77	.879
Ma Technology and science will enable us to solve environmental problems in the future	.431	0.51	.844
Pt I would like to spend a week alone along the river, in order to feel one with nature	.422	0.39	1.077
Mean level of adherence (Guardianship)		0.96	.569
Cronbach's alpha	.872		
Partnership with nature			
Pr I can have a relationship with nature just like I have with my friends	.894	0.05	.899
Pr I would like to have a relationship with nature just like I have with my friends	.871	0.04	.892
Pr Humans and nature are of equal value	.698	0.32	1.042
Pt I sometimes feel one with the universe	.659	0.08	.897
Pr Humans and nature deserve to be treated as equals	.561	0.73	1.031
Mean level of adherence (Partnership)		0.25	.723
Cronbach's alpha	.814		
Mastery over nature			
Ma Human beings have more value than nature	.818	-0.11	.938
Ma Nature cannot be allowed to stand in the way of economic progress	.757	-0.21	1.044
Ma Human beings have the right to alter nature radically	.731	-0.56	1.017
Pt When I am surrounded by nature I experience something greater than mankind	-.471	0.77	.879
Mean level of adherence (Mastery)		-0.41	.707
Cronbach's alpha	.703		

Table 5.3: Factor analysis of Images of Relationship. For each factor, items are listed in descending order of factor loadings, where factor loadings indicate how well an item fits into the factor. Mean level of adherence is the average agreement with a statement or factor, recoded to a scale running from -2 ('strongly disagree') to 2 ('strongly agree'). The abbreviations in front of the items refer to the original image they are a part of (Ma = Master, St = Steward, Pr = Partner, and Pt = Participant)

If we interpret the factors, we find that they correspond well with images from earlier studies. The clearest factor is the third one, in which we recognise the Master. It contains the three strong Master items, and a negative correlation with a Participant item. The factor has a good reliability for having only four items ($\alpha = .703$). The second factor is also very clear, as it contains four out of five Partner items, along with a Participant item. This Partner factor is not just clear, but also reliable ($\alpha = .814$). This is a pleasant surprise considering that, as mentioned in Chapter 2, earlier studies such as Hunka et al. (2009) found that Partnership items tended to spread among several factors.

The first factor is very reliable ($\alpha = .872$) but less clear compared to the original model, though it too reflects earlier findings. This first factor includes all Stewardship items, but also four out of five Participant items and one of the Master items. This combination of Stewardship and

Participation leads us to an ecocentric Steward, one who does not stand above nature but is part of it. A similar image was termed Guardianship in De Groot (2010), which is the term we use here as well. Our Guardian is somewhat different from the one in De Groot (2010), however, because it largely combines the Steward and the Participant, instead of the Steward and the Partner. Our Guardian, in other words, is more spiritual and more ‘submerged’ in nature. Having a Master item in this factor might seem odd, but it should be noted that ‘technology and science will enable us to solve environmental problems in the future’ is not a particularly despotic sentiment. It was included to trigger technological optimism, which is seen as a characteristic of the Master, but its separation from the other Master items is altogether not too surprising. Indeed, in earlier studies such as Van den Born (2006) and De Groot (2012) this item ended up being excluded from the factors. As such, we ought to reconsider the suitability of this item for expressing Mastery over nature.

If we look at the level of adherence to the three factors, we can see that Guardianship has the highest overall adherence (0.96 on a scale from -2 to 2), with two items expressing humanity’s responsibility to protect and preserve nature scoring especially high (1.35 and 1.53 respectively). Note that the more personal item ‘I feel an obligation to protect the natural environment’ scores somewhat lower (1.07). Partnership has a lower degree of adherence, though it is still positive (0.25). Although previous research suggests that practical concerns are a major cause for rejection of the Partner, it is interesting to note that the mean level of adherence to the items ‘I can have a relationship with nature just like I have with my friends’ and ‘I would like to have a relationship with nature just like I have with my friends’ is almost identical (0.05 and 0.04 respectively); it seems that our respondents have an equally neutral opinion regarding the *desirability* and the *possibility* of such a relationship of equals. Finally, Mastery is rejected by our respondents, with a mean level of adherence of -0.41. It is interesting to note that even though Mastery is rejected, it is less firmly rejected than in Van den Born (2006). In addition, though Guardianship is the most popular image its mean level of adherence in De Groot (2012) was much higher (1.58); this might be explained by the element of spiritual Participation in our Guardian, which is less broadly supported than the Stewardship elements. This is reflected in the Participation items in our first factor having lower mean levels of adherence compared to the Stewardship items.

Another way to express the popularity of an image is to see how many adherents each factor has in our sample. As explained in Chapter 4, we chose to count respondents as an adherent to a factor if their mean level of adherence was at least 1, which means respondents could be classified as adhering to several images. Using this criterion 40 respondents (53.3%) were classified as adherents to Guardianship, 13 respondents (17.3%) as adherents to Partnership, and only 1 respondent (1.3%) as adherent to Mastery. If we compare this to De Groot and Van den Born (2007) and especially De Groot (2012) our respondents seem to have a more neutral response to the factors; indeed, using this method 32 respondents (42.7%) were not classified as adhering to any of these three Images of Relationship.

It is also interesting to note that the argument used for human intervention in nature also mattered for our respondents. Befitting of the majority adhering to an ecocentric Guardianship, improving the quality of the natural environment was the most acceptable argument (0.96 on a scale

from -2 to 2), closely followed by improving flood safety (0.85). Improving the attractiveness of the landscape was somewhat less acceptable as an argument for human intervention in nature (0.60). Interestingly, increasing opportunities for recreation was given the lowest score (0.28), which ran contrary to our expectations. Considering how important nature is to our recreationists, however, it is perhaps not surprising that intervening in nature for the sake of recreation might be looked upon somewhat warily.

As a final step in the quantitative analysis, we used a contingency table to check whether adherence to a factor was related to background variables. Since only one respondent was classified as adhering to Mastery, this factor was left out. Recreation duration, recreation role, gender and level of education were all not significant. Adherents to Guardianship were more likely to be under 60 years of age ($p = 0.030$) and were more likely not to identify as religious ($p = 0.043$). This last relation is interesting since it seems to go against the religious roots of the Stewardship image; one should recall, however, that we consciously chose to remove all references to religion in our Stewardship items.

In our interviews we did not introduce each Image of Relationship separately to our interviewees, as was done in some earlier studies. We did, however, discuss how humans ought to relate to nature, and whether humans have a responsibility regarding nature. The rejection of Mastery over nature that we witness in our factor analysis was confirmed in our interviews as well. One element of the rejection of Mastery that interviewees expressed was that nature is ultimately too powerful to control:

I personally wouldn't mind if nature strikes back at some point, if a dike breaks at some point (...) I wouldn't feel pity. Because we try to master and control and subdue nature, but I think that if nature gets angry at some point that we will lose out. Just look at a hurricane, and look at a storm surge that comes over the dike. Yes, when nature really wants to we have no say. (F1)

We see here the 'hubris' argument also reported in Van den Born (2008). This interviewee also directly addressed the Master item on economic progress, as he felt that economic interests should never be more important than nature (F1). One interviewee noted that money and technology have enabled humans to rapidly deplete the environment (F4). On the other hand, three interviewees also admitted that losing some nature for the sake of economic progress is necessary if we want to maintain our current standard of living.

Regarding Stewardship, it is interesting to note that none of our interviewees, whether religious or not, saw a role for religion in their Image of Relationship. The idea of responsibility for nature, however, was broadly supported. Arguments for a responsibility included the fact that humans exert influence, as well as preserving nature for future generations. Considering the fact that the responsibility towards future generations has the highest mean level of adherence in our survey, it is no surprise we found it in the interviews as well. When we asked what this responsibility

entails, discussed elements included protecting and preserving nature, keeping it clean, and managing natural areas. Interestingly, one interviewee changed her perspective halfway through the interview: she first discussed how she felt humans were necessary to take care of nature, but when discussing intrinsic value she admitted that nature seemed perfectly capable of doing that on its own (F3). She tried resolving this inconsistency for herself by noting that human management might be necessary to allow humans and nature to coexist.

One interviewee expressed sentiments that are very close to the image of Partnership. He emphasised the balance between human society and nature, and noted that “we have to be able to live with each other” (B2). In fact, he noted that the Room for the River programme is an expression of this sentiment. One interviewee argued that humans can help nature, for instance by restoring old river streams (F2). Another used the example of farmers in the area taking care of nature, because “both should be able and allowed to do their job” (B3). This image of (organic) farming practice as an expression of Partnership is similar to how Kaltoft (1999) discussed such partnerships.

Not all interviewees agreed that there should be any intervention in nature, however. One argued that instead of changing nature, humans should adapt their society to ensure their own safety and minimize conflict with nature (F4). Another noted that humans can only spoil nature, and referred to the Middle Ages as a time when nature was everywhere and there was no human intervention (FB1). Regardless of the historical accuracy of this claim, the rejection of any human intervention in nature is notable. These sentiments are the closest we got to the Image of Participation. Note that there is still a separation between humans and nature expressed here, which is contrary to the image of Participation. This might be surprising considering the popularity of our Guardianship factor. One methodological note is in order here, however: looking back at our interview guide, our main question regarding Images of Relationship was ‘do humans have a responsibility towards nature?’, which already frames humans and nature as separate. As such, we did not leave much room for our interviewees to express true Participation sentiments.

In conclusion, we can see that our respondents are drawn towards a Guardian who combines Stewardship and Participation, which is slightly different from the Guardian as described in De Groot (2010). Our interviewees strongly supported a human responsibility to protect and preserve nature. Partnership was more clearly distinguished than in earlier studies, but was less popular than the Guardian. Mastery was rejected, largely for the placement of humans above nature and the hubris implied in this image.

5.3: Place Attachment

For the third and final time, we checked whether the data was fit for a factor analysis. At 0.827 the KMO-measure was more than satisfactory, and overall correlations were high enough. Once again SPSS could extract a maximum of 5 factors with eigenvalue greater than 1. Since the Scree plot had the clearest ‘elbow’ at 1 factor, which would defeat the point of the analysis, we decided to take the four-factor model of place attachment as our starting point and ran the rotated

factor analysis with 3, 4 and 5 factors. Though all of the models came out somewhat less clear than the factor analyses performed in the previous paragraph, we ended up choosing the five-factor model. Our three-factor model had one factor that was difficult to interpret theoretically, in addition to having two items excluded from the factors. The four-factor model somewhat resolved these issues, but even when suppressing all factor loadings below 0.45 there were six items that were included in two factors, making analysis difficult as well. The five-factor model still had several items split between two factors, but the factors were clearer and more readily interpretable. This model explained 71.068% of the variance, and all factor loadings below 0.45 were suppressed. The results can be found in Table 5.4.

The two clearest factors to interpret are the first and third factors. In the first factor we recognize place identity: this highly reliable factor ($\alpha = .875$) contains four out of five identity items, with their factor loadings running from 0.640 to 0.879. The third factor corresponds to place dependence, as all four dependence items are found here. This factor too is decently reliable ($\alpha = .786$). We thus refer to these factors as 'Place identity' and 'Place dependence' respectively. Note that there is one dependence item in the identify factor (though with a low factor loading) and one identity item in the dependence factor. A possible explanation is that while identity and dependence are seen as separate dimensions in this study they are of course connected; we discussed in Chapter 2 that these two processes of forming an attachment to place are related. In addition, a feeling of high satisfaction and comfort could be seen as a form of dependence that approaches identity forming, which could explain why this item ended up in the place identity factor⁹. On the other hand, it should also be noted that the item 'I am very attached to this river area' was reverse coded in the survey; this could have confused some respondents and slightly distorted the analysis. Overall, however, our findings support the conclusions of authors such as Kyle et al. (2004b) that place identity and place dependence are distinguishable as separate elements of place attachment.

The last factor that is easily interpretable is the fifth factor, which contains two items on spending time with family members. The factor has a rather low reliability ($\alpha = .588$), but this is not surprising considering it only contains two items. Since this factor clearly expresses a sentiment of using a place for bonding with family members, we termed this factor 'Family bonding' after Raymond et al. (2010). Interestingly, this factor originally included the item 'When I fish/boat in this river area I prefer not to be alone' with a good factor loading (.646), but inclusion of this item made Cronbach's alpha drop to an unacceptably low value (.343). As such, we were forced to remove it from the family bonding factor. It does support our interpretation, however, that this factor is a form of bonding with other people.

⁹ The author would like to thank Riyan van den Born for bringing this to our attention

	Factor loading	Mean level of agreement	Standard deviation of mean level
Place identity			
Id I feel this river area is a part of me	.879	0.24	1.076
Id This river area means a lot to me	.875	0.73	.977
Id Fishing/Boating in this river area says a lot about who I am	.784	0.51	1.018
Id This river area is very special to me	.640	0.83	1.018
Dp I get more satisfaction out of fishing/boating in this river area than any other place	.465	0.11	1.110
Mean level of adherence (Place identity)		0.48	.850
Cronbach's alpha	.875		
Belongingness			
So The contacts established through fishing/boating in this river area are very important to me	.782	0.39	.943
So I feel connected to other fishermen/boaters	.771	0.67	.977
Na I would be saddened if there would be a loss of plants and animals in this river area	.708	1.24	.714
Na I have become more interested in the natural environment in this river area since I started fishing/boating here	.670	0.65	1.007
Na When I spend time in the natural environment in this river area, I feel at peace with myself	.588	0.93	.920
Na I am very attached to the natural environment in this river area	.586	0.95	.787
So When I fish/boat in this river area I prefer not to be alone	-.510	0.52	1.095
Mean level of adherence (Belongingness)		0.62	.686
Cronbach's alpha	.861		
Place dependence			
Dp No other place can compare to this river area	.769	0.35	1.180
Id I am very attached to this river area	.693	0.56	1.177
Dp I would not substitute any other area for fishing/boating in this river area	.679	0.20	1.208
Dp I get more satisfaction out of fishing/boating in this river area than any other place	.636	0.11	1.110
Dp There are no better places for the activities I like to do than this river area	.511	-0.19	1.147
Mean level of adherence (Place dependence)		0.21	.855
Cronbach's alpha	.786		
Nature bonding			
Na The natural environment in this river area is important to me	.847	1.01	1.168
Dp There are no better places for the activities I like to do than this river area	.507	-0.19	1.147
Na I am very attached to the natural environment in this river area	.487	0.95	.787
Na When I spend time in the natural environment in this river area, I feel at peace with myself	.451	0.93	.920
Mean level of adherence (Factor 4)		0.68	.764
Cronbach's alpha	.742		
Family bonding			
So I enjoy taking my family along when I fish/boat in this river area	.736	0.28	1.073
So I would like to show this river area to my (grand)children	.512	0.87	.920
Mean level of adherence (Family bonding)		0.57	.841
Cronbach's alpha	.588		

Table 5.4: Factor analysis of our place attachment scale. For each factor, items are listed in descending order of factor loadings, where factor loadings indicate how well an item fits into the factor. Mean level of agreement denotes the average agreement with a statement or factor, recoded to a scale running from -2 ('strongly disagree') to 2 ('strongly agree'). The abbreviations in front of the items refer to the original dimension of place attachment they are a part of (Id = Place identity, Dp = Place dependence, So = Social bonding, and Na = Nature bonding)

There are two factors remaining, the second and fourth ones. The second factor contains three social bonding items and four nature bonding items, which makes it more challenging to interpret, while the fourth factor contains three nature bonding items and one dependency item, three of which are also found in other factors. The second factor is very reliable however ($\alpha = .861$), and if we look closely we can see that it does express a unique form of attachment. The two items with the highest factor loading are 'The contacts established through fishing/boating in this river area are very important to me' and 'I feel connected to other fishermen/boaters'. Note that these two social bonding items are distinctly different from the family bonding items: they do not express recreating with other people, but being part of a greater collective, being one of 'the fishermen/boaters of the Waal'. Establishing contacts, for instance by joining a local fishing group, does not mean they join you while recreating. We are talking here, in other words, about a more indirect form of social bonding. This is supported by the item 'When I fish/boat in this river area I prefer not to be alone' loading negatively onto this factor; apparently, adherents to this factor like being part of the collective, but do prefer to recreate on their own. The nature bonding items in this factor express bonding with the flora and fauna in the area, spending time in it, and growing more interested and attached to it. The nature bonding items thus also express the desire to be a part of something bigger, in this case nature. The inspiration for this factor's name came from Raymond et al. (2010), who called one of their factors "friend bonding / belongingness" (p. 427). The authors used the term 'belongingness' to refer to belonging to a social group, but the word can be more broadly used to describe a 'feeling of belongingness', of being part of something bigger; Hammitt et al. (2006) used this term in such a way to denote a form of place attachment. Since it corresponds well with our interpretation of the second factor, this factor was termed 'Belongingness'.

This leaves us with the fourth factor, which has an acceptable Cronbach's alpha ($\alpha = .742$). This factor mostly revolves around the item 'The natural environment in this river area is important to me', which has a much higher factor loading than the other items. These other items include two nature bonding items that are also included in factor 2, and a dependency item. Since the factor is strongly oriented towards an appreciation of nature and its benefits, we termed this factor 'Nature bonding'. Note, however, that this factor includes two items that were included in another factor, as well as two items that were reverse coded in the survey. As such, we suspect that at least some of the reason for this being a separate factor is confusion regarding the reverse coding. This issue will be taken up further in the discussion in Chapter 6.

Let us move on to the adherence to the five factors. At first glance, Table 5.4 already tells us that the mean degrees of agreement come out fairly similarly to each other, most means being on a range between slight to moderate agreement. Nature bonding and belongingness come out as the most agreed with dimensions, followed by family bonding. Place identity takes fourth spot, with place dependence being the least agreed with, with a low (though positive) mean degree of 0.21. The two most agreed on items are those on sadness over loss of nature and on the importance of nature, these being the only items with a mean degree above 1 (1.24 and 1.01 respectively). The only item with a negative mean degree is 'There are no better places for the activities I like to do than this river area', which respondents on average disagree with (though -0.19 is fairly neutral).

Using the same method as we did for Images of Relationship, we also classified all respondents with a mean degree of agreement ≥ 1 as agreeing with a factor. Our results here give a slightly different picture than the mean levels of agreement: the most agreed with factor was family bonding with 34 respondents (45.3%), closely followed by nature bonding with 30 respondents (40%). In descending order, the remaining factors are identity with 23 respondents (30.7%), belongingness with 19 respondents (25.3%) and finally dependence with 16 respondents (21.3%). These differences can be explained by noting that mean degree of agreement measures the *strength* of agreement: apparently family bonding is something many respondent reach a score of around 1 on, while a feeling of belongingness is felt by fewer respondents but felt very strongly by those who do. Interestingly, dependence is the least agreed with factor using both methods.

Our contingency tables, the results of which are shown in Table 5.5, show the effects of background variables on agreement with these five forms of place attachment. Our findings confirm that, like length of residency for residents, recreation duration in the area has an influence on the levels of place identity, belongingness and place dependence of our respondents; specifically, those who have recreated more than 30 years in the area scored highly on these factors. In addition, those who live in the area scored higher on place identity. We found no statistically significant relationship between recreation duration and nature bonding, which it similar to how Raymond et al. (2010) found no such relationship for residents either (p. 430). Age, gender, education, religion and spending a major part of childhood in the area showed no statistically significant relationships with the factors, which we did not really expect based on the literature discussed in Chapter 2.

	Identity	Belongingness	Dependence	Nature bonding	Family bonding
Recreation duration	.044	.032	.006		
Recreation role	.000	.000	.000	.000	.032
Age					
Gender					
Education					
Living in the area	.017				
Childhood in the area					
Religion					
Highest Value of Nature	.032	.000	.046	.000	
High Functional				.023	
High Wild					
High Penetrative					
High Guardian					.024
High Partner	.046				
High Master					

Table 5.5: Results of Cross tabulation of the five place attachment factors and several other variables. The numbers in the table are the p-values of Pearson's Chi-square; only p-values ≤ 0.05 are shown

Following our third research question, we also checked if the classifications used for our Visions of Nature analysis related to our place attachment dimensions. It is interesting to note that the group of respondents who valued nature with a 5 out of 5 ('very important') tended to score

more highly on identity and dependence, and especially on belongingness and nature bonding; those last two are highly significant ($p = 0.000$). It is of course not surprising that those who value nature very much score more highly on belongingness to a natural area and bonding with nature, but seeing it confirmed in our analysis is encouraging. We also checked whether Images of Nature and Images of Relationships might be related to place attachment. For Images of Nature we found one statistically significant relationship: those who scored functional nature highly on naturalness were less frequently found in the group with high levels of nature bonding. This is not altogether surprising: those who can also appreciate houseplants as real nature might be less in need of bonding with outdoor natural areas. The relationships between place attachment and Images of Relationship were less revelatory: Guardians more often scored highly on family bonding, possibly because of the 'future generations' element of the Steward, and Partners more frequently reported higher levels of place identity. Overall though, especially Values of Nature appears to be somewhat indicative of higher levels of place attachment among our respondents.

The variable that stands out most, however, is recreation role. Fishermen were much more frequently found in the group with mean levels of agreement ≥ 1 on all factors, with only family bonding having a p-value greater than 0.000. These differences were quite remarkable: for instance, only 1 out of 44 boaters reached the benchmark value on place dependence, while a majority (14 out of 25) of the fishermen did. We did expect such a relationship, since boaters tend to recreate across much larger areas and as such were hypothesised to form less of an attachment to a specific place, but these results surpassed our expectations. Recall also that we showed in paragraph 5.1 that the fishermen in our sample were much more likely to have a special place in the area; having such a special place likely contributes to developing greater attachments.

These findings confirmed insights gained in our interviews as well. When asked whether they considered the area to be 'theirs', three of the four fishermen immediately described it as 'their' Waal; in addition, two of them had a few specific groynes that they considered 'theirs'. Both of them noted that while the area is technically not their property, it does feel like it. One of them noted that no other area he fished in could compare (F1), which is a clear indication of place dependence, while the other noted that because of their extensive use of the groynes the local fishermen felt a sense of responsibility for the area (F3). One fishermen mentioned that they often felt 'one with the river' (F2), a form of place identity that also brings to mind Participation in nature, while another described it as having "Waalblood coursing through his veins" (F1). In addition, three fishermen agreed that they felt at home in the area.

It should be noted that the two fishermen who most frequently discussed such strong sentiments about the project area (F1 and F3) do not boat on the river, while all our other interviewees do. The fishermen with a boat tended to emphasise connections with the Waal in general rather than the specific project area, while the boaters tended to discuss other rivers as well. In addition, the boaters we interviewed did not really discuss strong sentiments like being 'one with the Waal', or the Waal being crucial in their life; rather, they emphasised enjoyment of the landscape for residence or recreation. Our interviews thus seem to suggest that being strongly

rooted in a recreation area plays a role in forming stronger attachments with it, which is what we would expect to find based on the literature.

Seven out of eight interviewees argued that the Waal is a unique river, mostly because of its wild and dynamic nature (F4), its diversity (B1) and its importance for the shipping industry (B2). The only exception was one interviewee, who noted that “all flood meadow areas are the same for me” (B3). In addition, while the draw of nature in the area was discussed extensively, social attachments to the area came up much less frequently. Several respondents mentioned that they took their family or friends to the area, but this did not seem to be key to their attachment. The only exception is one of the fishermen, who noted that the Waal for her meant coming together with people from her village, and that celebrations such as New Year’s Eve along the river provided a sense of solidarity in the village (F3). We can see here the social element of belongingness which we also saw in our factor analysis.

In summary, our factor analysis confirmed the identity and dependence dimensions from earlier studies, but found a belongingness factor along with family and nature bonding. Our analysis revealed that the fishermen in our sample reported much higher levels of attachment across all five dimensions, which we hypothesize could have to do with them being more ‘rooted’ in one specific spot. In addition, we found that high valuation of nature seemed to be indicative of higher levels of attachment to the area.

5.4: Evaluation of the Measures

After giving respondents a basic description of the measures, along with an artist’s impression of the longitudinal dams and a map showing their planned locations, respondents were asked to rate the dams on five criteria: beauty, naturalness, effects on flood safety, accessibility of the area, and the effects on ease of fishing/boating. In addition, they were asked for an overall evaluation of the measures. The resulting scores are found in Table 5.6, while Figure 5.2 presents the data in a bar chart.

	Fishermen	Boaters	All
Beauty	-0.60	-0.09	-0.37
Naturalness	-0.48	-0.16	-0.39
Flood safety	0.04	0.39	0.20
Accessibility	-0.96	-0.05	-0.43
Ease of recreation	-0.60	0.23	-0.15
Overall evaluation	-0.72	0.02	-0.31

Table 5.6: Respondents’ evaluation of the longitudinal dams. Mean scores are given on five criteria (“I expect the longitudinal dams to make the area...”) as well as an overall evaluation (“Overall I think placement of the longitudinal dams in this river area is a good idea”) running from -2 to 2 (‘strongly disagree’ to ‘strongly agree’). Mean scores are given for fishermen, boaters, and all respondents (which includes respondents who identified as both)

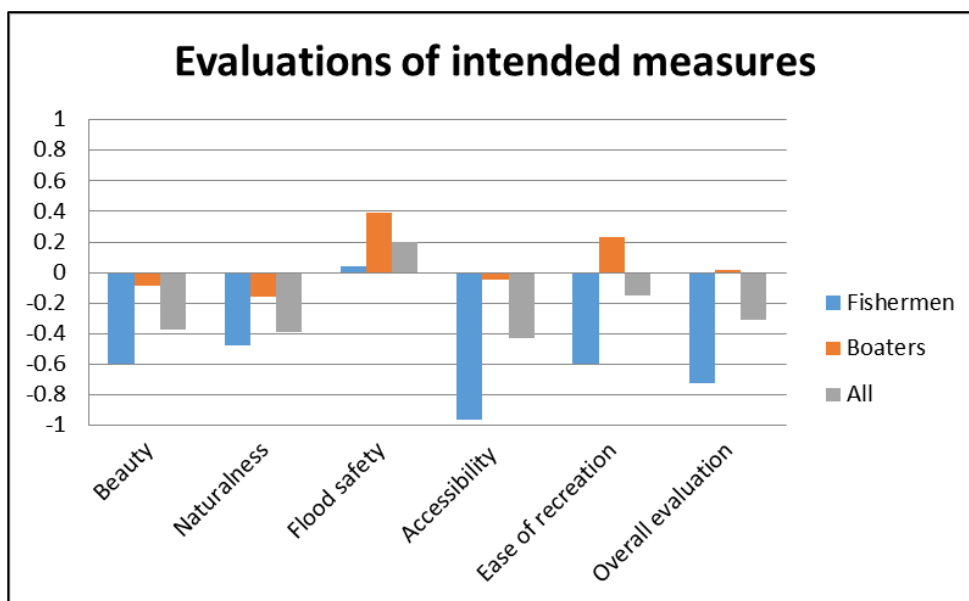


Figure 5.2: Respondents' evaluation of the longitudinal dams, presented as bar charts. The y-axis runs from -1 (disagree) to 1 (agree). Mean scores are given for fishermen, boaters, and all respondents (which includes respondents who identified as both)

Overall, respondents evaluated the longitudinal dams negatively. Accessibility, beauty and naturalness are all evaluated with a mean score of around -0.40, and flood safety is the only criterion where the mean score among all respondents is positive (0.20). Table 5.6 and Figure 5.2 also show that the fishermen in our sample are much more negative about the measures than the boaters; especially the differences in expected effects on accessibility and ease of recreation are notable (-0.05 and 0.23 for the boaters respectively, compared to -0.96 and -0.60 respectively for the fishermen). Clearly the fishermen in our sample are much more pessimistic about the placement of longitudinal dams, especially concerning the effects it will have on their recreational activities.

The same criteria that we presented to all respondents were also touched upon in the interviews. Concerning the expected effect on the natural environment in the area, our interviewees' expectations centred around whether they felt nature was fragile or not; in other words, it seemed to be connected with their Image of Nature. Four interviewees, all of whom fished, expressed their worries that the measures would cause great damage to the natural area. Their concern was not so much with the dams as with the removal of the groynes, as they feared removal of the groynes would cause stronger currents along the river bank, which would prevent fish from spawning there. In addition, popular fish such as the barbel and the zander were noted to prefer the area between the groynes, and as such these interviewees feared for their continued presence after the measures. These fears were also expressed by several respondents in the survey. The other four interviewees on the other hand, three boaters and one fishermen, argued instead that effects on nature would be either small or temporary. In this case the natural environment in the area was seen as resilient, as exemplified in the quotation below:

A: Of course it will briefly have an impact on the entire landscape, flora and fauna, but in a year you won't notice any of it, then it will be overgrown or green (...)

Q: It will restore itself?

A: Yes, I think fairly quickly, and that's the beauty of a river landscape (B2)

Concerning flood safety, respondents tended to agree that the measures would improve flood safety by improving the flow of water along the river, thus helping to prevent dangerously high water levels. This corresponds with the relatively positive mean score this criterion scored in our survey. Our interviewees did express a few concerns, however: for instance, several noted that the river might also start to flow too strongly once the groynes are removed, which they feared might lead to safety risks for boaters. In addition, several respondents discussed the issue of the river silting up; some feared that the measures would lead to the build-up of silt, which they feared would narrow the river and thus conflict with the goal to give the river more room to flow.

Regarding beauty and landscape aesthetics, some survey respondents and interviewees feared that the dams would ruin the natural landscape and block the characteristic view on the river. One interviewee noted that the dams looked decidedly "thought up by humans", which did not fit in with his appreciation of the landscape (F4). Interestingly, he quickly admitted that groynes are themselves human interventions and not natural either, but argued that the groynes "have been here for years now and have become part of the landscape" (F4). Several interviewees, however, expressed doubts whether there would be significant effects on the landscape.

As for accessibility and ease of recreation, one frequently discussed topic was the safety for ships, both recreational and professional. Reflecting our survey results, boaters on average were positive. The three dedicated boaters we interviewed were quite enthusiastic about the plans to split professional and recreational ships, as the Waal was seen as a rather dangerous river to navigate. Some other interviewees brought up a few possible dangers, however, including a stronger flow of the river (F4) and the possibility of ships colliding with the dams (FB1). The second aspect brought up often was the accessibility for fishermen. The low mean score on this dimension for fishermen was reflected in the interviews as well: all the interviewees who fished noted that the removal of the groynes and/or the possible damage to spawn locations would be detrimental to their ability to recreate in the area. The only positive effect of the measures on fishermen's ability to recreate was argued to be the ability to trailer boats to the waterside (F2). Overall, for the fishermen the negatives clearly outweighed the positives.

Finally, we inquired about possible effects of the measures on interviewees' attachment to the area. The three boaters we interviewed did not expect the measures to have much of an effect on their bond with the area. The fishermen did express a fear of losing their attachment; phrases used ran the gamut from the area becoming "boring and uninteresting" (F2) all the way to the measures being described as "the beginning of the end" (F1). Some of the fishermen discussed having to relocate to other areas; however, as noted in the previous paragraph fishermen tended to feel more dependent on their current location. For instance, one interviewee noted that she had made arrangements for members of her local fishing organisation to fish with another local group,

but she also agreed that it would feel a bit like fishing “in someone else’s water” (F3). As such, our interviews support the finding that the fishermen in our sample are more negative about the measures than the boaters.

As a final step in our analysis, and following our final research question, we decided to enter the six evaluation criteria from Table 5.6 into a contingency table with several background variables, as well as our place attachment and Visions of Nature dimensions. For the evaluation criteria we took our sample as a whole and split it for every criterion between those who were positive, neutral, and negative about the measures. The results are found in Table 5.7.

	Beauty	Naturalness	Flood safety	Accessibility	Ease of recreation	Overall evaluation
Recreation duration						
Recreation role	.013	.039		.012		
Age		.018		.006		
Gender						
Education						
Living in the area						
Childhood in the area						
Religion						
High Identity						
High Belongingness						
High Dependence						
High Nature bonding						
High Family bonding						
Highest Value of Nature						
High Functional	.001	.038		.014		.002
High Wild						
High Penetrative						
High Guardian			.024			
High Partner		.020		.042		.021
High Master						
Landscape attractiveness						
Special place						
Sense of safety				.032		
Flood awareness				.046		
Trust Rijkswaterstaat			.006			.006
Personal responsibility						
Dams knowledge			.045			
Project awareness						

Table 5.7: Results of Cross tabulation of the six evaluation criteria and background variables, place attachment and Visions of Nature. The numbers in the table are the p-values of Pearson’s Chi-square; only p-values ≤ 0.05 are shown

First of all, if we look at relations between evaluations and Visions of Nature we notice that Values of Nature has no relationship with any of the criteria. Those respondents who ascribed an above average level of naturalness to functional nature were much more positive about the expected beauty, naturalness, accessibility and overall evaluation of the measures. These findings are in line with our expectations; those with a broad Image of Nature are more likely to accept the longitudinal dams as becoming part of the natural landscape than those who emphasise wild and

untouched nature. As for Images of Relationship, adherents to Guardianship were more likely to be positive about the effects of the dams on flood safety. The Guardians' emphasis on this aspect of the dams could be linked both with the 'future generations' element of Stewardship as well as the desire to protect nature. After all, as one interviewee noted, a direct threat to humans would be a threat to animals as well (B2). The Partners in our sample were more optimistic about the expected naturalness of the dams, as well as their effect on accessibility and their overall evaluation. Apparently for these respondents the longitudinal dams are a form of humans working with nature. Adherence to Mastery showed no relationships, which is not surprising considering only one respondent could be classified as adherent to this Image of Relationship.

Interestingly, agreement with any of the place attachment dimensions was not related to evaluation of the measures at a statistically significant level. This runs contrary to our expectations, since we would expect high levels of place dependence or nature bonding, for example, to be related to negative evaluation of the dams. This result is in line with De Groot (2012), who found no relationship between Sense of Place and river management options. She argued, however, that such a relationship would be expected "as soon as specific measures are planned in the nearby floodplain" (De Groot, 2010, p. 103); this expectation was not confirmed here, however. Indeed, other attachment-related variables such as whether the landscape was evaluated as attractive or not, or whether respondents had a special place in the area, were not related to evaluation of the measures. It seems that Visions of Nature and forms of recreation are more strongly related to evaluation of the measures than place attachment.

Speaking of recreation role, we were not surprised to find that this background variable was significantly related to evaluation of the measures. Specifically, boaters were more positive regarding the beauty, naturalness and accessibility of the measures. This ties in with the results reported earlier in this paragraph, especially concerning the fears the majority of the fishermen we interviewed seemed to have regarding the effect on nature in the area. The fishermen's more negative evaluation of accessibility support our earlier findings as well. Other background variables did not reveal much in the way of statistically significant relationships: the only exception is age, specifically that respondents of 60 years or older were more positive about the effects of the measures on naturalness and accessibility of the area. Gender, education, religion, living in the area and having spent a significant part of their youth in the area were all not significant.

Finally, sense of safety, which we probed simply by asking whether respondents felt safe when recreating in the area, was related to accessibility: those who felt safe were more sceptical about the effects on accessibility of the area. This could be explained by noting that especially boaters who feel unsafe on the Waal might feel that the separation of professional and recreational boats will make the area safer and thus more accessible to recreationists. Oddly enough, flood awareness, whether respondents frequently thought about flood risk in the area, was not related to flood safety but did show a statistically significant relationship with accessibility. Table 5.7 also shows a relationship between knowledge about what longitudinal dams are (86.7% of respondents professed to know 'somewhat' or 'exactly' what longitudinal dams are) and expectations of effects on flood safety, but this relationship was rather unclear.

A more interesting finding is that those who said they did not trust Rijkswaterstaat for ensuring flood safety were more negative about the measures in general, and their effects on flood safety in specific. Trust in Rijkswaterstaat was mentioned quite frequently by respondents as well as interviewees. On the one hand, those who trusted Rijkswaterstaat seemed to more easily accept benefits of the measures; one interviewee noted that “if a number of experienced hydraulic engineers think of something like that or start working on it, then I tend to trust it” (B1). On the other hand, some took a ‘seeing is believing’ position, while others were downright sceptical:

A: See, I’m sure there are people at Rijkswaterstaat that have studied for this (...), but then I wonder if they’ve got it right?

Q: Yes, are the models actually correct?

A: Exactly (FB1)

One cause of distrust seems to be experiences with earlier projects: both survey respondents and interviewees brought up such experiences as shaping their expectations of this one. The relationship between trust in Rijkswaterstaat and evaluation of the measures is interesting; it seems to indicate that building trust with recreationists could contribute to acceptance of both the longitudinal dams as well as future projects.

In summary, both the mean evaluations of our survey respondents, as well as the discussions with our interviewees, revealed that overall evaluations were rather negative, with only the effects on flood safety generally seen as positive. We also saw that fishermen tended to be much more negative than boaters, though our contingency table revealed that this relationship was not statistically significant for every criterion. Place attachment did not seem to be indicative of positive or negative evaluations, while some dimensions of Visions of Nature were; especially having a broad Image of Nature was shown to lead to more positive evaluations. Finally, most background variables were not related to evaluations as a statistically significant level, with the relationship between trust in Rijkswaterstaat and positive evaluation of the measures argued to be the most interesting result.

Chapter 6: Conclusion and Reflection

In this final chapter we will first revisit our findings in order to answer our research questions and draw our conclusions; this is done in paragraph 6.1. Paragraph 6.2 will provide a theoretical reflection, in order to discuss the theoretical implications of our findings, and a methodological reflection, wherein we will look back at the decisions we made throughout the project and discuss where we could have improved our approach. Finally, paragraph 6.3 closes the thesis by briefly discussing the implications of our findings for the pilot project.

6.1: Conclusion

In this paragraph we will cast our gaze back to the introduction, specifically to our research questions, and briefly discuss what we found in relation to each question.

1. What are the Visions of Nature of the fishermen and boaters in the project area?

Our results on Values of Nature indicate that nature is very important to our respondents, with a mean score of 4.41 on a scale from 1 to 5. Respondents' articulated Values of Nature emphasised recreational values such as beauty and relaxation, which was in line with our expectations. Intrinsic value was a less popular option than in earlier studies, though some intrinsic logics were mentioned in the interviews.

Regarding Images of Nature, factor analysis revealed that respondents did not follow our own classification as discussed in Chapter 4. Respondents recognised a functional and a wild Image of Nature, but our Arcadian items were absorbed into these functional and wild nature images, while a penetrative nature image that we did not intend to include was clearly recognised. The item 'the Waal river' was not included in any factor, which we argued could be either due to the river being multifunctional, or due to the item being less specific. Our interviews taught us that, consistent with earlier research, a lack of human interference was an oft-cited criterion for 'real' nature. Our interviewees held differing views on the position of humans in nature and whether nature is vulnerable or not, while occasionally appearing somewhat inconsistent.

Finally, our analysis of Images of Relationship revealed that respondents recognised the Mastery and Partnership images, but combined Stewardship and Participation to create a highly ecocentric form of Guardianship; this is a different Guardian than the one in De Groot (2010), though the combination of responsibility for and being part of nature had been found in earlier studies. This Guardian was the most popular image; our respondents seemed drawn to the responsibility inherent to the Stewardship image, but preferred an ecocentric Steward that is 'one with nature'. Interestingly, the Partnership image was recognised more clearly than in earlier studies. We also found that when presenting several arguments for human intervention of nature to our respondents, improving the quality of the natural environment was seen as the most acceptable argument. In our interviews we found rejection of the Master and a strong agreement with the Steward's responsibility, though elements of Participation were rarely emphasised. We argued that this was likely a result of our framing of the interview questions.

2. *What are the place attachments to the project area of the fishermen and boaters?*
3. *How are the Visions of Nature of the fishermen and boaters related to their place attachments?*

Concerning place attachment, our second research question, factor analysis showed that respondents recognised identity, dependence and family bonding factors in accordance with earlier studies. Our respondents also recognised a type of attachment expressing a desire to be ‘part of something bigger’, which we referred to as belongingness. Interestingly, this form of social bonding did not involve recreating with other people. Nature bonding was also recognised, though this factor largely revolved around one item, and as discussed in the next paragraph its appearance might be due to choices we made when designing the survey.

The response to these factors at first glance seemed somewhat neutral, with slight to moderate agreement reported on all five factors, but our contingency table showed that place attachment differed markedly between fishermen and boaters: fishermen felt a much stronger attachment to the Waal on all five dimensions. This seems to confirm results from earlier studies, as the rootedness and development of special places inherent in fishing from the groynes appears to contribute to increased bonding with the area. This relationship between recreation role and place attachment was observed in our qualitative data as well, as the fishermen we interviewed expressed stronger emotional bonds with the area than the boaters we spoke to.

Our third research question revolved around connecting Visions of Nature and place attachment, which we did by entering our Visions of Nature dimensions into a contingency table with our place attachment dimensions in order to check the influence of the former on the latter. The connection between Values of Nature and place attachment was strongest; considering nature ‘very important’ was related to higher levels of attachment, especially to the natural environment. Appreciating functional nature as ‘real’ nature was also related to place attachment; we found that such an appreciation seems to lessen the need for strong nature bonding along the Waal. Images of Relationship did not show many relationships with place attachment, though Stewards seemed partial to family bonding; we suggested that the Steward’s care for the future generation might lie at the basis of this relationship.

4. *How do these recreationists evaluate the intended measures of the pilot project?*
5. *How is their evaluation of the intended measures related to their Visions of Nature, place attachments and background variables?*

Regarding the evaluation of the intended measures, our final two research questions, based on Devine-Wright and Howes (2010) we expected negative evaluations due to the measures likely being seen as a technological disruption of a restorative natural area. This expectation was confirmed by our results, as the dams were negatively evaluated by our respondents on almost all criteria. Only the effects on flood safety were evaluated positively, while beauty and naturalness were assessed more negatively. Our interviews revealed that boaters brought up safety concerns such as regulating traffic on the river, while the fishermen especially worried about fish populations and a reduced opportunity to find fishing spots. This was reflected in the strongly negative score the fishermen gave to the dams’ effect on accessibility (-0.96). Sampling bias of course has to be taken

into account, and will be discussed in the next paragraph. Still, the myriad of concerns raised by our respondents are unlikely to be felt only by those 75 people.

Our contingency tables showed that many relationships were not statistically significant; indeed, the most surprising of these were the place attachment dimensions, none of which were significantly related to evaluations. What was statistically significant, however, was recreation role: fishermen were more negative about the measures on all accounts. And since we noted above that fishermen felt more attached to the area, it could well be that attachment is indirectly related anyway. Of our Visions of Nature dimensions, the most revelatory was a functional Image of Nature, as those respondents who appreciated functional nature as ‘real’ nature were more positive about the measures. Most other variables were not significant, though less trust in Rijkswaterstaat was related to scepticism about the effects on the measures on flood safety. This relationship carries some interesting implications, which we return to at the end of this chapter.

6.2: Reflection

In this paragraph we briefly reflect on our research project as a whole. Paragraph 6.2.1 will discuss a few theoretical implications of our findings, while paragraph 6.2.2 will highlight the methodological angle by reflecting on our design choices.

6.2.1: Theoretical Reflection

Looking back at our Visions of Nature results, we would like to emphasise two findings that are especially interesting in relation to previous work on the theory. First of all, while intrinsic value was not a particularly popular option with our respondents, this does not mean that they can be assigned a strongly anthropocentric position. Indeed, as discussed in both Chapter 2 and Chapter 5 we ought to remember that intrinsic value remains a difficult concept to grasp for people. As argued by McShane (2007), however, the fact that people struggle with the notion does not mean they do not value nature for its own sake. Indeed, our interviews seem to indicate that especially fishermen feel very strongly connected to nature while recreating, and respect for natural beings was emphasised several times. We would argue here that the recreationists we studied are likely more ecocentric than our Values of Nature analysis indicates, a claim supported by the Participation elements of our Guardianship image.

Secondly, concerning Images of Nature and the role of humans in nature we find something similar to earlier studies: interviewees seemed to switch between seeing humans as separate from nature, where nature is vast and resourceful, and a nature where humans participate and thus can also significantly damage it. What we would like to focus on here is a line of argumentation we encountered that was also found by De Groot and Van den Born (2007): some interviewees seem to consider humans as part of nature only if they act in an appropriate manner. This could include respecting nature, or not polluting or damaging it. Interestingly, this line of thinking would imply that according to this lay philosophy we could split humans into two groups: those we are ‘in touch with’ and part of nature, and those who are not. Yet respondents in De Groot and Van den Born (2007) all

denied that we could split humans into two groups like that, which seems decidedly inconsistent. Probing this apparent inconsistency in certain lay Images of Nature would be an interesting point for further research.

Concerning place attachment, our most interesting finding is that respondents recognise more dimensions of this concept than just place identity and place dependence, and that they even go beyond the four dimensions we studied. Our 'belongingness' factor combined being part of a social and natural whole, while appreciating this bond on your own. Our findings thus support the claim by Hammitt et al. (2006) that place attachment research should expand beyond the identity and dependence dimensions, and we would urge place researchers to delve deeper into these diverse meaning places hold for people.

Another interesting result of our analysis is that recreation role was significantly related to place attachment, but not to Visions of Nature. In other words, fishermen and boaters differed in their type and strength of attachment to the area, but they shared ideas about what nature is and how humans ought to relate to it. This raises some interesting possibilities; are Visions of Nature perhaps less malleable than place attachments, and thus less subject to change due to factors such as recreation behaviour? Or perhaps recreating in a natural area, as both fishermen and boater do, has influenced their Visions of Nature, but the type of recreation is of lesser importance? Our analysis here is not able to answer these questions, but they provide some interesting perspectives for further research.

Finally, a theoretical goal of this study was to make a first attempt at connecting Visions of Nature and place attachment. Our first results are modest but encouraging: while the link with Images of Relationship was limited, nature bonding did not seem to mix well with an appreciation of functional nature as 'real' nature, and high valuation of nature seemed to be related to higher levels of attachment. Connecting these two strands of theoretical material obviously deserves much more attention than we were able to give it here, but our results do seem to indicate that elements of our lay philosophy of nature also influence in what way and to what degree we grow attached to places.

6.2.2: Methodological Reflection

Conducting research could be seen as a long series of decisions: about what to investigate, about how to approach the data, and about how to unravel the data to uncover relevant information. In this paragraph we will review some of the decisions we made over the course of this project, and discuss what we might have changed now that we have the luxury of looking back. For the sake of brevity we will focus here on two elements of our project: sampling and research design.

Concerning sampling, one issue that springs to mind is our relatively low number of respondents. While 75 respondents was enough for us to carry out the analyses we aimed for, we would have preferred a larger sample. Finding respondents was in fact somewhat of a pilot project for us as researchers as well as the organisations helping us, as the recreationists along the Waal were a new group for us to try and reach. One explanation for the low number of respondents could

thus be our less-than-optimal first try; as noted in Chapter 4, especially local fishing groups were initially somewhat reluctant to participate. The low number of respondents definitely constitutes a weakness of this study.

Perhaps a more interesting issue than sample size, however, is sampling strategy. In Chapter 4 we argued that traditional sampling methods such as random selection were not possible for us, since we had no way to contact recreationists directly. We chose what we still feel was the best option, which was to use recreation organisations as an intermediary. As a form of self-selecting sampling, however, this strategy does magnify the issue of sampling bias. It is likely that for both groups of recreationists, those with the strongest opinions on the intended measures (whether positive or negative) were more likely to complete the survey. This might very well have influenced our analysis; for instance, the evaluations of the measures were decidedly negative in this study, but could very well be more neutral in the larger population of recreationists. We would argue, however, that the major differences between the place attachments and evaluations of the fishermen compared to those of the boaters were not influenced by our sampling strategy. Since we approached both groups using the same sampling strategy, we likely encountered both the fishermen and the boaters with the strongest opinions on the Waal and the intended measures. As such, the differences between the groups would likely be found in the larger population as well. Indeed, it is remarkable how strong the levels of significance sometimes were, taking the small sample size into account. These considerations do support our decision to limit generalisations to a larger population, as our sample is unlikely to be an accurate reflection of the entire population. As reiterated at several points in this thesis, we were duly aware of this issue when discussing our results.

As for research design, we are overall rather pleased with the design of the survey and interview guide. The survey items on Visions of Nature especially stood out: the factor analyses of Images of Nature and Images of Relationship both showed clear and reliable factors. In addition, the only item out of the two analyses that was not included in a factor was 'the Waal river', which was a result in itself. As noted before, we included this item to see under which Image of Nature respondents would classify it; clearly, the item is either too broad or too abstract (or both) for respondents to classify consistently. One issue with construct validity of the Humans and Nature (HaN) scale, however, is the item 'technology and science will enable us to solve environmental problems in the future'. As argued in Chapter 5, both this study and several earlier studies have shown that the item expresses a sentiment that lay people do not associate with the much stronger element of Mastery over nature present in the other Master items. Indeed, while technological optimism is seen as an element of the Mastery image, appreciating the potential for technological solutions is not really in conflict with a Steward or a Guardian, or even a Partner. Indeed, in a 21st century increasingly dominated by complex technology, science and technology play an unmistakably large role in combating environmental issues. If this item is to remain as an expression of Mastery over nature, perhaps it would be prudent to strengthen it, for example by rephrasing it as 'technological developments are sufficient to deal with any environmental problem in the future'. A stronger statement might be more characteristic of true technological optimism as characteristic of the Master.

While we were pleased with the Visions of Nature scale items, we were somewhat less impressed with the factor analysis of our place attachment scale. Looking back, a major source of distortion seems to be our decision to apply reverse coding to four of the place attachment statements; these reverse coded statements tended to end up in different factors than other statements expressing the same dimension, and especially ‘The natural environment in this river area is important to me’ seems to have become largely its own factor due to this. We decided to apply reverse coding in order to keep respondents on their toes, but it seems we mostly succeeded in confusing them. In future studies, we will have to carefully assess whether the risks of reverse coding are worth the benefits.

Regarding our qualitative research component, our interview guide largely succeeded in inviting interviewees to discuss their attachment to the Waal and their ideas about the measures. Two points of improvement stand out, however, both concerning Visions of Nature. Firstly, like in Van den Born (2008) intrinsic value remains a difficult issue to explain in an interview. Interviewees sometimes struggled with the notion of value without a human valuer, and our more concrete example of a closed-off natural area was perhaps not the best illustration of this abstract notion of intrinsic value. On the other hand, respondents did sometimes broach discussions reflecting the literature, such as the respondent who brought up that animals could assign value just as humans can. While this element of qualitative inquiry into Visions of Nature still demands more attention, it remains a fascinating element of environmental philosophy.

Secondly, we already mentioned in Chapter 5 that when discussing the human position in relation to nature we left little room for Participation in nature to be discussed. Looking back, we ourselves framed humans and nature as being separate entities in our questions, which made it difficult for interviewees to express other viewpoints. Instead of asking people “are humans part of nature”, we could first explain that there is a discussion on whether humans are a part of nature or not, and then ask for the interviewees’ point of view. On the other hand, doing so would likely steer the respondent too much; we are interested in their own voice, after all, not their confirmation of ours. As such, open questions like the ones we used might ultimately be the most suitable option. In addition, it is quite difficult to introduce the topic of ‘humans and nature’ without framing them as separate. However, in future studies we will pay even more attention to the way questions can influence possible responses.

Finally, an important element of our overarching research design was our use of mixed methods. Using mixed methods is certainly challenging; we attempted to broach the same topics in both the survey and the interviews, but uniting these two very different datasets is not an easy task. However, we close off this reflection by noting that despite its challenges mixed methods are of unmistakable value. We feel that this study would have painted a much more incomplete picture without either the quantitative or the qualitative data. We chose to give greater priority to our quantitative data, but the interviews gave invaluable insight into what being attached to a river means, and why some people have doubts about the expected benefits of the longitudinal dams. We thus support the call for continued use of mixed methods research into these topics.

6.3: Implications for the Pilot Project

As we explained in Chapter 1, the practical relevance of this project was its collection of baseline data on stakeholder perceptions of the Waal. In this final paragraph of the thesis, we briefly address two points we feel are relevant to keep in mind for the future of the pilot project. We are of course hesitant to generalise too much, but as we noted before some of the concerns we encountered here are likely shared by more people than just our respondents. As such, we feel these two points deserve mention.

Firstly, we found that nature is very important to our respondents, and plays an important role in respondents' attachment to the Waal. Our respondents also strongly agreed that humans have a responsibility towards nature, and improvement of the natural environment was reported as the most acceptable argument for human intervention in nature. Taking all of these considerations into account, we would suggest emphasising the aspect of nature benefits in communication to recreationists, as the expected effects on nature could be an important factor in their overall levels of acceptance. Seen in this light, the low score for expected effects on nature found here is worrying. Especially fishermen seem very concerned about the effects of the measures on the fish populations. The monitoring of river ecology, also part of the pilot project's monitoring programme, can play an important role here. If the monitoring indicates permanent harm to the fish populations, steps ought to be taken to mitigate the damage, not just in the interest of nature but also in order to improve support for the measures.

The issue of trust is the second point we would like to emphasise here. Trust in Rijkswaterstaat was related to a more positive evaluation of the measures, which is a double-edged sword. On the one hand, this gives practical relevance to our efforts: by speaking to different groups and learning about their concerns, we can help to build trust and in turn improve their views of the measures. On the other hand, it also means that when this trust is lost it will negatively influence expectations of current and future projects. We would advise Rijkswaterstaat to communicate monitoring results throughout this project; monitoring can take years, and if recreationists are not kept up to date they may start to grow suspicious. Rijkswaterstaat has wisely decided to involve recreational organisations in its current communication strategy; this ought to be maintained. Fishermen do their own monitoring of fish populations, and some keep in contact with fishing organisations about this; as such, these organisations can aid in the dialogue between fishermen and Rijkswaterstaat, which is important for building trust. In addition, recreationists' local knowledge could be useful to include in the monitoring itself, as some of these recreationists have intimate knowledge of the area. By keeping this group informed and involved their trust in Rijkswaterstaat will likely improve, which might ultimately help to make the changes in the landscape easier for them to accept.

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