



Research Paper

The role of place attachment in public perceptions of a re-landscaping intervention in the river Waal (The Netherlands)

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ABSTRACT

Rivers are among the most heavily managed landscapes worldwide. The meanings people ascribe to river landscapes and their preferences for management have implications for public support for management decisions. This paper reports on a postal survey (N = 1102) on perceived landscape qualities (place attachment, scenic beauty and safety perception) and public perceptions of a planned river intervention in four residential areas along the river Waal (The Netherlands). The objectives of this study were to (1) examine the relationship between place attachment and socio-demographic and geographic variables, and (2) explore the role of perceived landscape qualities in public perceptions of a planned river intervention. Multiple regression analyses showed that socio-demographic and geographic variables explain 21–41% of variation in place attachment dimensions (including place identity, place dependence, social bonding, and narrative bonding). We found that local residents have intermediate to strong bonds with the area and that village residents were more attached than city residents. Narrative bonding was tested as a separate dimension, which resulted in a coherent set of statements with good reliability. Overall, the planned intervention was positively evaluated, especially in terms of improving flood safety. Social bonding, scenic beauty, and recreational value correlated positively with the evaluation scores. Our findings emphasize the importance of place as a social environment in residents' responses to re-landscaping river interventions and we discuss opportunities to engage local communities and sustain social processes in river management.

1. Introduction

People perceive, value and interact with landscapes in multiple ways, making them complex social-ecological systems. Rivers are among the most heavily managed landscapes worldwide (Nilsson, Reidy, Dynesius, & Revenga, 2005; Tockner & Stanford, 2002). Landscape interventions in rivers include large-scale, regulating engineering works, such as the construction of dams, as well as river restoration or rehabilitation measures aimed at decreasing human influence and increasing natural values. Climate change and urbanization put increasing pressures on river landscapes in terms of flood resilience and flood protection (Palmer et al., 2009). For example, the Netherlands has many low-lying, flood-prone urban areas and a long tradition in flood protection and river management (Baan & Klijn, 2004). After the near-floods in 1993 and 1995 new measures were implemented to maintain safety standards in the face of the projected increase in river discharges resulting from climate change (van Stokkom, Smits, & Leuven, 2005). River landscapes were transformed to create more space for the river, for example by constructing side channels or excavating floodplains,

and enable sustainable use of its resources for economic, ecological and human well-being benefits (Rijke, van Herk, Zevenbergen, & Ashley, 2012). Incorporating local values, knowledge and perspectives to account for these benefits is one of the major challenges of river management (e.g. Fliervoet, van den Born, Smits, & Knippenberg, 2013; Gundersen, Kaltenborn, & Williams, 2016; Smith, Clifford, & Mant, 2014).

Local residents' livelihoods are among the ones greatest affected by both floods and flood prevention measures, however, their particular interests are often not represented in decision-making processes (Burley, Jenkins, Laska, & Davis, 2007; Junker, Buchecker, & Müller-Böker, 2007; Michels, 2016). As Manzo and Perkins (2006) already noted, practitioners often regard research on public perceptions as a luxury, however, the costs of overlooking social and contextual factors may be great. Several studies highlight the importance of considering emotional connections to place (or place attachment) in planning processes for river management (Agyeman, Devine-Wright, & Prange, 2009; Davenport & Anderson, 2005; Jacobs & Buijs, 2011). These bonds may take a long time to develop (Åberg & Tapsell, 2013) and relate to

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different values, such as recreational values, naturalness, and connectedness to landscape (Junker et al., 2007; Seidl & Stauffacher, 2013). The relationships between the meanings individuals ascribe to landscapes and their preferences for management outcomes have become an increasingly important area of research, as they may explain conflicting views on landscape management (Gundersen et al., 2016; Smith, Davenport, Anderson, & Leahy, 2011) or community opposition to new developments (Vorkinn & Riese, 2001).

We present a case study of the planned construction of longitudinal training dams in the river Waal (The Netherlands) with the aim to improve our understanding of the role of people's attachment to rivers in shaping their perceptions of re-landscaping management interventions. To inform this study, we first reviewed existing literature on place meanings of and attachment to river landscapes in a management or restoration context. The intervention under consideration in our study aims for an integral solution to river issues (i.e. to improve flood safety, ecological conditions and navigability) and is not a river restoration project per se. However, we do believe that this literature is relevant as it also concerns landscape change. Using a sample of local residents of four communities living along the river Waal, we then examine (1) the influence of socio-demographic and geographic variables on four dimensions of place attachment (i.e. place identity, place dependence, social bonding, and narrative bonding) and (2) the role of perceived landscape qualities (including place attachment, scenic beauty and safety perception) in public perceptions of this planned river intervention.

1.1. Interpreting place meanings in changing landscapes

People's responses to place changes are complex and result from the process of (1) becoming aware, (2) interpreting, (3) evaluating, and (4) coping, leading (possibly) to (5) resistance or support (Devine-Wright, 2009). This complex relationship becomes apparent when reviewing qualitative studies on place meanings in a river setting. A qualitative study carried out in rural Nebraska by Davenport and Anderson (2005) found four interlinked river meanings; depicting the river as (1) part of people's or communities' *identity*, (2) a place for recreation that is beneficial for the body and mind (as a *tonic*), (3) a resource (or *sustenance*), and (4) a place for *nature*. They conclude that it "is not simply a matter of being for or against development", but that, depending on the nature of the intervention, meanings attributed to the river could be enhanced or interfered (Davenport & Anderson, 2005, p. 639). Using semi-structured interviews with Dutch floodplain residents, farmers and water professionals, Jacobs and Buijs (2011) identified beauty, functionality, attachment, biodiversity, and risk as important place meaning categories. For local residents, their appreciation of the beauty of the riverine landscape (determined by nature, agricultural use and historical elements) shaped positive attitudes toward stream restorations (Jacobs & Buijs, 2011). A public perception study based on semi-structured interviews which were held 14 years after a restoration project in England found similar categories but also noted the importance of connections between the river and the landscapes, changes in the landscape after restoration, and the role of history, memories and traditional practices (Westling, Surridge, Sharp, & Lerner, 2014).

Places can also become meaningful through spiritual or mythological relationships, participation in cultural events, and storytelling and place naming (Low, 1992). Thus, the understanding that places give meaning to one's identity inherently includes a historical dimension which should not be overlooked (O'Neill, Holland, & Light, 2008). This sense of identity is rooted in what Drenthen (2013, p. 17) refers to as a "narrative understanding of place", in which landmarks construct a narrative that reflects the history of the place and its relation to people (Drenthen, 2009a). For example, the traditional groynes in the river Waal (i.e. small dams placed perpendicular to the river; Fig. 1) continue to tell the story of the Dutch that 'tamed' the river in the 18th and 19th century to keep people protected from floods and to make it suitable for

shipping (Lenders, 2003). Moreover, people often have memories that are specifically linked to these landmarks, either from their childhood or as part of recreational activities. Through re-landscaping interventions (such as the replacement of groynes by longitudinal training dams), these cultural and historical meanings of a landscape may be lost, creating non-places without any historical identity or narrative value (Drenthen, 2009b; Westling et al., 2014). While this may be true, it is also important to note that places may regain meaning as people familiarize themselves with or learn more about their new environment (Davenport & Anderson, 2005). For example, a large-scale survey among school pupils living in small Polish communities found that educating young people about local history yielded an increased interest in history and greater place attachment (Stefaniak, Bilewicz, & Lewicka, 2017).

Place attachment broadly refers to affective bonds between people and places and has been studied extensively in the past decades (Altman & Low, 1992), in particular in the field of environmental psychology. As a concept, it originated independently in different disciplines and therefore a broad spectrum of terms and concepts is employed (Hernández, Hidalgo, & Ruiz, 2014). For example, Trentelman (2009) notes that 'place attachment' and 'sense of place' are both used as overarching concepts while subcomponents such as place dependency and place identity are used as constituent parts of both. Recently, Raymond, Brown, and Weber (2010) developed and tested a framework with four dimensions of place attachment, including place identity, place dependence, social bonding and bonding with nature. Place identity (referring to personal affective bonds) and place dependence (referring to an instrumental value) are two of the most well studied dimensions of place attachment. Social bonding refers to meaningful social relationships and shared experiences, for example in the neighborhood where you live or when engaging in social outdoor activities (Hidalgo & Hernández, 2001; Kyle, Graefe, & Manning, 2005). The fourth dimension refers to bonding with the natural environment (Raymond et al., 2010).

In a theoretical discussion of place identity and risk perception, Wester-Herber (2004) argues that artificial landscape changes may stigmatize places by negatively affecting an individual's sense of self-esteem and self-efficacy, a loss of distinctive landscape features, or through disruption of continuity. Therefore, attachment to place should be given importance in itself, and not be "disguised as health or environmental concern" (Wester-Herber, 2004, p. 114), as it may influence whether people support decisions for land (use) change. It is not easy to detect a direct relation between people's attachment to place and their support for river management, because this is highly depending on contextual factors, such as the kind of intervention and the location. Previous quantitative research on this topic mainly addressed personal attachment to and recreational value of an area using a composite variable such as 'importance of the river' (de Groot & de Groot, 2009) or 'sense of place' (de Groot, 2012) in the analyses. For example, de Groot and de Groot (2009) found both positive and negative relationships between the perceived importance of the river and public support for different management interventions (i.e. negative for cutting down trees and dike relocation, while positive for the construction of side channels). In a follow up study in France, Germany and The Netherlands, sense of place did not emerge as a significant predictor (de Groot, 2012). The mixed-method study of Buijs (2009) sheds some light on the plurality of views among residents by identifying different frames used to inform their arguments to oppose or support river restoration. While people adhering to an attractive nature frame supported river restoration, those using an attachment or rurality frame opposed it, reflecting their fears of losing cultural heritage and agricultural land respectively. Other place attachment literature suggests that people with higher place attachment report greater social and political involvement in communities and are more likely to work together to achieve mutual goals such as protecting social and physical features that characterize their places (Mesch & Manor, 1998).

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