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Perception matrices: An adaptation of repertory grid technique

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ABSTRACT

Perceptions of stakeholders can influence who is included and excluded from environmental policy-making processes. Repertory grid technique is a qualitative method that captures how a person differentiates objects according to dimensions of similarity. Used in a qualitative way, repertory grids reflect a person's individual constructed reality of the world. We adapt the technique to create a quantitative perception matrix that offers research participants the same set of stakeholder groups and descriptors that, unlike qualitative applications, can be used to compare perceptions between decision-makers to understand and predict preferences for stakeholder inclusion. Eight senior policy advisors and six scientists who were involved in developing fox eradication policies in Tasmania, Australia, completed a perception matrix with a supplied set of stakeholder groups (i.e. repertory grid elements, e.g. government, media, general community) and descriptors (i.e. repertory grid constructs, e.g. credibility, effectiveness, influence). They rated each stakeholder group against each descriptor. The results show that different groups of stakeholders were rated similarly to each other, for example, scientific experts and government departments were rated similarly between participants, and were considered more credible and effective than the general community and the media. The results also show that sets of descriptors were used to describe stakeholders, for instance if a stakeholder was perceived to be credible, they also tended to be perceived as effective. Differences between policy advisors and scientists revealed opportunities to explore functional roles of stakeholders, where stakeholders are considered in terms of *what* they can offer to the decision making process, rather than *who* they are. Our adaptation of repertory grid technique, with supplied elements and constructs, demonstrates the usefulness of perception matrices in enabling statistical comparison of implicit perceptions; identifying similarity and variability among individuals' perceptions of stakeholders; and providing a visual representation of the structure of perceptions of groups of individuals.

1. Introduction

An ever-growing number and diversity of stakeholders seek to have a voice in environmental policy processes (Eden, 1994; Reed, 2008; Welp et al., 2006). How decision-makers perceive and characterize these stakeholders can influence who is included or excluded from policy processes and how stakeholders' concerns are reflected in policy outcomes (Dryzek and Berejikian, 1993; Reed et al., 2009). Decision-makers often use their perceptions to anticipate how stakeholders will respond to a policy problem or to gauge their acceptability of policy alternatives (Chevalier and Buckles, 2008; Reed et al., 2009). Decision-makers can also use their perceptions of stakeholders when choosing engagement tools and targeting policy messages (Anderson et al., 1998; De Lopez, 2001; Shandas and Messer, 2008). Including legitimate stakeholders, perceived or otherwise, in policy processes can be crucial for successful policy implementation (Bryson and Bromiley, 1993; Grimble and Wellard, 1997; Moon et al., 2015).

Decision-makers' perceptions of stakeholders can be both explicit and implicit. Explicit perceptions are those that are known, expressed or written; implicit perceptions are those that are unknown, or unconscious, or not yet articulated (Fazio and Olson, 2003; Raymond et al., 2010). Expression of explicit perceptions

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of stakeholders can be observed as deliberate, formal and strategic decisions or engagement processes, while implicit perceptions are more likely to be found embedded within codified norms and rules (Matten and Moon, 2008) and in informal relationships (Pahl-Wostl, 2002). Implicit perceptions are important to reveal because they can explain explicit preferences for who is involved in policy-making processes and why (Moon et al., 2015; Reed et al., 2009); preferences that might not be immediately obvious. For instance, the notion of stakeholder legitimacy is often implicitly coupled with power, creating a perceived authority and allowing some stakeholders access to policy processes while denying others (Mitchell et al., 1997). Comparing implicit perceptions can be useful in revealing who is providing stakeholders access to policy processes and why. Implicit perceptions, however, can be difficult to elicit, particularly quantitatively (Fazey et al., 2006), limiting opportunities to define and compare the range of perceptions that can influence stakeholder engagement. That is, implicit perceptions are difficult to elicit but if we want to understand who is gaining access to policy processes, and why, then we need to be able to elicit these perceptions. If we want to compare these perceptions, then we need quantitative methods. Only a handful of existing methods are available and we test whether one of them, an adapted repertory grid technique, to determine if it would be a useful quantitative method to elicit and compare decision-makers' implicit perceptions of stakeholders in an environmental policy setting (Adams-Webber, 1970).

Repertory grids were developed in the 1950s by George Kelly (1955) to operationalize his personal construct theory (Fransella et al., 2004). He supposed that people develop a set of theories about how the world is structured on the basis of their personal interpretations of objects and the environment around them, what he called 'constructs' (Girard, 2013). These theories, or expectations, are used to understand and navigate the world, and are tested by experience and behaviour and modified accordingly. When a person receives information that contrasts with their personal construct system, they have the opportunity to revise their constructs. He stated that constructs are finite and bipolar (Kelly, 1955) so, for instance, a stakeholder could be perceived as enabling or disabling, supportive or unsupportive.

Kelly created the repertory grid, a matrix to capture an individual's personal construct system, essentially how they differentiate objects according to dimensions of similarity or contrast. For example, does a person consider that the 'general community' is informed or uniformed about climate change? Repertory grids comprise three components: a set of elements (objects), a set of constructs (descriptors of objects), and a "linking mechanism" that allows each element to be assessed against each construct (Daniels et al., 1995; Easterby-Smith, 1980a). For example, evidence (element) can be credible or not credible (construct), and can be measured using a rating scale (1 = not credible; 5 = credible) (linking mechanism). Repertory grids offer a well-articulated set of data elicitation and analysis methods, and unlike many other implicit perception measures (Fazio and Olson, 2003), have a solid theoretical basis (Bjorklund, 2008; Hillier, 1998; Kelly, 1955).

The *structure* of the grid has the potential to be immensely useful in designing stakeholder engagement strategies, in terms of tailoring and delivering strategies to specific groups based on perceptions of their role and value (e.g. Girard, 2013). Repertory grids with supplied elements and constructs can be used to compare a full set of descriptors for an unlimited number of stakeholders from a group of decision-makers. The structure of the repertory grid offers a method to access perceptions that provides for mapping and multidimensional analysis of data, enabling greater understanding and practical intervention at a range of scales (Cliffe, 1986; Tan and Hunter, 2002). Yet, existing applications of repertory grids used in the land use policy and environmental domain have involved the researcher supplying elements, while constructs have been elicited from the participants (e.g. Merenlender et al., 2016; Raymond et al., 2016; Schweinsberg et al., 2012; Sühlsen and Hisschemöller, 2014; van de Kerkhof et al., 2009; Vasileiadou et al., 2014; Yorke, 1978). Because the constructs can be vastly different from one another in such applications, they do not allow for constructs to be compared quantitatively between participants. Even when similar constructs are observed, shared meanings cannot be inferred. Traditional applications of repertory grid technique are, therefore, useful for revealing individual personal construct system, but are not useful for comparing perceptions between individuals.

While some authors have discussed the value of using grids with supplied elements and constructs (Easterby-Smith, 1980a, 1980b; Tan and Hunter, 2002), we have been able to find very few examples that apply the grids in this way either in the land use and environmental policy domains or more broadly (e.g. Coakes et al., 1999). One reason for the paucity of repertory grid research with supplies elements and constructs could relate to epistemological challenges (e.g. Klapper 2011). Some researchers argue that *meaning* is lost when elements and constructs are supplied, without which the grid has limited value (see Adams-Webber, 1970; Fransella et al., 2004 for a discussion). Another reason could be the implicit assumptions that researchers make about participants' perceptions of the elements and constructs as well as their responses. As Yorke offers: "The situation calls to mind the scene in the film Romanoff and Juliet in which Peter Ustinov is heard to declare 'We know they know we know their code': can the researcher using repertory grids claim likewise?" (1978, p. 64). Or simply that, personal constructs are more useful to participants than researcher-elicited constructs (Adams-Webber, 1970).

Thus, our aim is to demonstrate the value of using repertory grids as a quantitative tool to compare implicit perceptions. Given the different epistemological foundations of our application (i.e. objectivist versus constructionist), we create distance to Kelly's repertory grids by redefining the grid as a 'perception matrix'. Below, we explain the epistemological differences between our approach and Kelly's. We outline how we have applied repertory grids with supplied elements and constructs, assisting researchers to understand some of the considerations associated with selecting this method. We then move on to describing the methods, and focus our discussion on the usefulness of the repertory grid method for understanding stakeholder inclusion in environmental policy processes. We provide details of our case to demonstrate the nature of the data that grids can provide, but our focus is on the application of our method.

1.1. Case study: fox eradication in Tasmania, Australia

We used the European red fox (*Vulpes vulpes*) eradication policy-making process in Tasmania, Australia to explore senior policy advisors and scientists' (i.e. decision-makers) perceptions of stakeholders. Invasive species management presents a useful case to examine decision-makers' perceptions of community stakeholders (i.e. local, affected and/or interested individuals or groups, herein referred to as stakeholders) because successful control or eradication commonly relies on stakeholder participation. Thus, the perceived legitimacy of stakeholders by decision-makers could influence the extent to which they are engaged and thus their support for a program (Morrison et al., 2011; Veitch et al., 2011).

Reports of fox incursions into Tasmania were recorded between 1998 and 2001. The red fox has caused half of the known mammal extinctions worldwide in the last 200 years (Kinnear et al., 2002; Short and Smith, 1994), and within Tasmania alone would threaten to put 78 native terrestrial vertebrate species at risk of extinction (see Blackman et al., 2013; Blackman et al., 2014; Moon et al., 2015; Sarre et al., 2014; Saunders et al., 2006 for further details of the