

# Cognitive Research in Information Systems

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## INTRODUCTION

The existence and significance of cognition in organizations and its influence on patterns of behaviour in organizations and organizational outcomes are increasingly accepted in information systems (IS) research (Barley, 1986; DeSanctis & Poole, 1994; Griffith, 1999; Griffith & Northcraft, 1996; Orlikowski, 1992, 1994 #208). However, assessing the commonality and individuality in cognition and eliciting the subjective understanding of research participants either as individuals or as groups of individuals remain a challenge to IS researchers (Orlikowski & Gash, 1994). Various methods for studying cognition in organizations have been offered - for example, clinical interviewing (Schein, 1987), focus groups (Krueger, 1988), discourse-based interviewing (Odell, Goswami & Herrington, 1983). This article proposes that cognition applied to making sense of IT in organizations can also be explored using Kelly's (1955) Personal Construct Theory and its methodological extension, the Repertory Grid (RepGrid). The RepGrid can be used in IS research for uncovering the constructs research participants use to structure and interpret events relating to the development, implementation, use and management of IS in organizations.

In the context of this article, cognition is considered to be synonymous with subjective understanding: "the everyday common sense and everyday meanings with which the observed human subjects see themselves and which gives rise to the behaviour that they manifest in socially constructed

settings" (Lee, 1991, p. 351). Research into cognition in organizations investigates the subjective understanding of individual members within the organization and the similarities and differences in the understandings among groups of individuals (Jelinek & Litterer, 1994; Porac & Thomas, 1989). In IS research, it is the personal constructs managers, users and IS professionals use to interpret and make sense of information technology (IT) and its role in organizations. The discussion here outlines the myriad of ways the RepGrid can be employed to address specific research objectives relating to subjective understanding and cognition in organizations. It illustrates, from a variety of published studies in IS (see Table 1), the flexibility of the RepGrid to support both qualitative and/or quantitative analyses of the subjective understandings of research participants.

## BACKGROUND

We propose to use a framework to facilitate this discussion (see Figure 1) that presents a two-dimensional view of the types of research using the repertory grid. The examples in Table 1 are mapped along these two dimensions.

### Theory-Focused vs. Method-Focused

On one dimension, we distinguish research that applies Kelly's (1955) personal construct theory (theory-focused)

Figure 1. Distinguishing research using the repertory grid

Theory-Focused	Hunter (1997)*	Latta and Swigger (1992) =
Method-focused	Moynihan (1996)*	Rhythian and King (1992)=

\* Idiographic (i.e. individual interpretations - unique grids)

= Nomothetic (i.e. group interpretations - common grids)

from those applying the repertory grid method, without delving into the conceptual underpinnings of the theory (method-focused). When introduced some 45 years ago, the repertory grid technique served as the methodological extension of the personal construct theory. It operationalizes key aspects of Kelly's fundamental postulate and corollaries. IS researchers interested in the subjective understandings of individuals will find the repertory grid a powerful tool that permits the study of the individual's construct system and provides richer cognitive insights into research findings. For example, Latta and Swigger (1992) validated the use of the repertory grid for representing commonality of construing among participants regarding the design of intelligent user interfaces. The study lent strong support to the commonality corollary in grids, which can be confidently used to represent a consensus of knowledge around a problem domain. Hunter (1997) used the laddering technique to elicit what Kelly termed as super-ordinate constructs – constructs that are core to the individual's system of interpretation.

In contrast, there is research that has accepted Kelly's theory and employed the repertory grid solely as a data gathering technique. These works have employed the utility of the technique purely for its methodological strengths. Stewart and Stewart (1981) suggest, "At its simplest, Grids provide a way of doing research into problems – any problems – in a more precise, less biased way than any other research method" (pp. vii). These authors further contend that the repertory grid "...enables one to interview someone in detail, extracting a good deal of information ... and to do this in such a way that the input from the observer is reduced to zero" (p. 5). Two of the examples in Table 1 have taken the method-focused approach to the use of the repertory grid technique. For instance, Moynihan (1996) was purely interested in using the repertory grid technique to collect data and to compare the results with the extant literature. Moynihan argued that the free-ranging responses resulting from the non-prohibitive nature of the technique permitted the participants to apply the "theories-of-action" (theories individuals use to guide their actions) they employ daily – resulting in the identification of themes and issues over and above the extant literature. In the studies by Phythian and King (1992), the repertory grid was used to explore the similarity and differences in the views between individual managers. No direct references were made to Kelly's personal construct theory, as the focus was to identify key factors influencing tender decisions and the relationships among these factors by interviewing two managers closely involved in such tender activities.

### **Qualitative vs. Quantitative**

On the second dimension, we distinguish research that is either qualitative or quantitative. The identification of emerging themes from elicited constructs is common in a

qualitative approach using the repertory grid. For example, Hunter (1997), when investigating how certain groups of individuals interpreted the qualities of "excellent" systems analysts, employed content analysis of the data gathered from individual interviews conducted using the repertory grid technique. The numeric component of the grid was only employed to conduct visual focusing at the end of each interview as a means of quickly assessing what had transpired during the interview and whether the research participant agreed with this initial assessment. Similarly, Moynihan (1996) employed the repertory grid technique as a method to elicit interpretations from research participants of what aspects were considered important when deciding upon an approach to adopt for projects to be conducted for external clients. Unique grids were developed for each research participant. Then the data were analyzed from a qualitative perspective via content analysis at the construct level, where emerging themes were identified and categorized. In these examples, the researchers took an open view toward gathering data and allowed themes or categories to emerge from the data as the investigation proceeded.

In contrast, the quantitative approach utilizes mathematical and/or statistical analyses of grid data (Daniels, Markoczy & de Chernatony, 1994). These techniques are commonly used to explore the structure and content of an individual's construct systems or make comparisons between groups of individuals (Ginsberg, 1989). This approach was adopted by two of the examples in Table 1. For instance, in Phythian and King (1992), statistical analyses (specifically, cluster analysis and correlation analysis) were conducted on individual and combined grids. These data were used to support the development of an expert support system. Similarly, Latta and Swigger (1992) applied cluster analysis and Spearman's rank order correlation to analyze the grids. The study revealed an overall correlation between the students' and the instructor's grids, promoting the utility of the repertory grid technique in modeling knowledge relating to the design of information systems.

### **Idiographic vs. Nomothetic**

Within both the qualitative and quantitative perspectives, research using the repertory grid technique is either idiographic or nomothetic in nature. The idiographic approach focuses on the subjective experiences of the individual and presents results in expressions and terms used by the individual. The resulting grid is considered unique in that there are no common elements or constructs employed in the elicitation process. For example, in the study of systems analysts, each participant was asked to name up to six systems analysts with whom s/he had interacted. In this project, Hunter (1997) provided a role description (i.e., system analysts interacted with) and asked each participant to specify examples that fit this category. The analysts named were not common

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