Chapter 5.15
Relating Cognitive Problem-Solving Style to User Resistance

Michael J. Mullany
Northland Polytechnic, New Zealand

INTRODUCTION

This chapter explores cognitive problem-solving style and its impact on user resistance, based on the premise that the greater the *cognitive difference* (*cognitive gap*) between users and developers, the greater the user resistance is likely to be. Mullany (1989, 2003) conducted an empirical study demonstrating this. This study contradicts the findings of Huber (1983) and supports Carey (1991) in her conclusion that cognitive style theory, as applied to IS, should not be abandoned. Mullany's findings, in fact, are the opposite. Kirton (1999, 2004) supported Mullany's results. In particular, Mullany made use of Kirton's (2004) adaption–innovation theory. The emergent instrument, called the Kirton adaption–innovation inventory (KAI; Kirton, 1999, 2004), was used by Mullany as his measure of cognitive style.

Mullany's study also investigated the relationship between user resistance and user ages and lengths of service in the organisation. It failed to show any relationship between these factors and user resistance. This countermands the findings of Bruwer (1984) and dismisses any intimation that older or longer-serving employees are necessarily more resistant to change as myths.

BACKGROUND

Ever since the early 1980s, experts have identified user resistance to new systems as an expensive time overhead (see studies by Hirschheim & Newman, 1988, and Markus, 1983). Some authors suggest the greater importance of age and length of service. Bruwer (1984), for instance, claimed to have demonstrated that the older or longer-serving an employee, the more resistant he or she is likely to be to a new computer system. Clarification of issues surrounding user resistance has also highlighted *cognitive style theory* as potentially important, but to date, its impacts have only been sparsely researched in relation to user resistance, many of the prior studies being open to question. This research, on the other hand, proposes that a system will fail when the developer and user differ significantly in their problem-solving ap-

proaches. To reduce user resistance, it thus makes sense to recommend system designs that suit the user's approach to problem solving.

This issue appears only to have been studied empirically by Mullany (1989, 2003). He formulated the research question, "Is there a relationship between user resistance to a given information system and the difference in cognitive style between the user and the developer?" With the aid of his own instrument for measuring user resistance and the Kirton adaption–innovation instrument (Kirton, 1999) to measure the cognitive styles of users and associated system developers, he found a highly significant relationship between developer–user cognitive style differences and the level of user resistance to systems.

Why no other studies along similar lines have been reported in credible current research is difficult to explain. One possibility is that the literature contains speculative studies, such as that by Huber (1983), that discredit cognitive-style theory as a tool in understanding system success. Other studies, such as that by Carey (1991), while encouraging the continued use of cognitive-style theory in studying system phenomena, do not demonstrate its predictive success in information systems (IS). The remainder of this chapter thus examines the meaning and measure of cognitive style, the measure of user resistance, the specific findings of Mullany (1989, 2003), and outlooks for the future in this area of research.

THE MEANING AND MEASURE OF COGNITIVE PROBLEM-SOLVING STYLE

Liu and Ginther (1999) defined *cognitive style* as, "An individual's consistent and characteristic predispositions of perceiving, remembering, organizing, processing, thinking and problem-solving." Schroder, Driver, and Streufert (1967), in a discussion of human information processing, suggested that organisms "either inherit or develop characteristic modes of thinking, adapting or responding and go on to focus upon adaptation in terms of information processing." In short, an individual exhibits characteristic ways of processing information (and, hence, solving problems), known as his or her "cognitive style." Table 1 gives an historic summary of key experts over the years who have endeavoured to name and measure the construct of cognitive style. Of these, the MBTI (Myers–Briggs type indicator) is the most used

Table 1. Cognitive-style constructs: Key studies

Reference	**Cognitive-Style Construct**	**Instrument**
Kelly (1955)	Cognitive complexity or simplicity	**RepGrid** (Repertory grid)
Jung (1960)	Jungian typology	**MBTI** (Myers–Briggs type indicator)
Witkin et al. (1967)	Field dependence or independence	**EFT** (Embedded figures test)
Hudson (1966)	Converger or diverger	None
Schroder et al. (1967)	Cognitive complexity	**DDSE** (Driver's decision-style exercise)
Ornstein (1973)	Hemispherical lateralisation	Brain scan
Kirton (1976)	Adaptor–innovator continuum	**KAI** (Kirton adaption–innovation inventory)
Taggart (1988)	Whole-brain human information processing	**HIP** (Human information-processing instrument)