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# The relationship between learning style and cognitive style

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## Abstract

One of the principal debates in the field of individual differences in ‘learning style’ (often used to include cognitive style) has centred around the proliferation of constructs and measures, many of which have been developed with little regard for extant theories and instruments. This study explored the construct validity of learning style as operationalised in the Learning Styles Inventory (LSI) and its relationship with cognitive style as measured using the Cognitive Styles Analysis (CSA). In addition the relationship between styles and learning preferences was examined. Correlational and principal components analyses suggested that: the Learning Style Inventory assesses two dimensions as theorised by Kolb (comprehension and transformation); learning style and cognitive style are independent and the relationship between style and preference is mediated by gender. © 2001 Elsevier Science Ltd. All rights reserved.

*Keywords:* Cognitive style; Learning preferences; Learning style

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## 1. Introduction

The term ‘learning style’ is used widely in education and training to refer to a range of constructs from instructional preferences to cognitive style (Riding & Cheema, 1991). One of the most significant taxonomic developments in the field came with the work of Curry (1983). She placed learning style in between learning preferences and cognitive style in a layered ‘onion’ model of individual difference constructs. The ‘core’ of the onion is the central personality dimension; as one passes outwards from the centre, the constructs (cognitive style, learning style and learning preferences) become increasingly open to introspection, more context-dependent

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and less fixed. In spite of this theoretical advance individual researchers continue to design and develop their own instruments without sufficient regard for extant theory and measures, consequently there is the potential for real confusion amongst researchers and practitioners alike. As Furnham (1992) noted ‘the proliferation of eponymous questionnaires that overlap considerably cannot be good for the development of the discipline’. If the field is to progress there is a need to delineate cognitive styles and learning styles as separate constructs (if indeed they are such). The LSI has been the subject of recent analyses by Willcoxson and Prosser (1996), Yahya (1998) and Loo (1999). Their findings gave some support to the LSI’s two-dimensional structure, however they did not consider learning style in relation to other constructs. It is the aim of this study to assess the validity of a widely used measure of learning style — the Learning Styles Inventory (Kolb, 1985) and compare it with a measure of cognitive style (Cognitive Styles Analysis; Riding, 1991).

### *1.1. Cognitive style*

Messick’s (1984) definition of cognitive style as consistent individual differences in preferred ways of organising and processing information and experience has been cited widely. Sternberg and Grigorenko speculated that cognitive style may represent ‘a bridge between what might seem to be two fairly distinct areas of psychological investigation: cognition and personality’ (Sternberg & Grigorenko, 1997). Riding and Cheema (1991) argued that learners differ in terms of two fundamental and independent dimensions of cognitive style, the wholist-analytical (WA) dimension and the verbaliser-imager (VI) dimension (Riding, 1991). The wholist-analytical dimension of cognitive style describes the habitual way in which an individual processes and organises information: some individuals will process and organise information into its component parts (described as analytics); others will retain a global or overall view of information (described as wholists). Low correlations ( $r=0.05$ ) have been reported between the wholist-analytical dimension of cognitive style and intelligence as measured by the British Abilities Scale (Riding & Pearson, 1994). The verbal-imagery dimension of cognitive style describes an individual’s habitual mode of representing information in memory during thinking. According to Riding (1994) verbalisers ‘consider the information they read, see or listen to, in words or verbal associations’; imagers on the other hand, when they read, listen to or consider information, experience ‘fluent spontaneous and frequent pictorial mental pictures’. As with the WA dimension, very low correlations ( $r=0.12$ ) have been reported between the VI dimension and intelligence (Riding & Pearson, 1994). Riding and Wigley (1997) observed very low correlations ( $r < \pm 0.09$ ) between both cognitive style dimensions and the scales of the EPQ-R and IVE personality questionnaires (Eysenck & Eysenck, 1991).

### *1.2. Learning style*

Kolb (1984) described learning as a four-stage process consisting of concrete experience, observation and reflection, formation of abstract concepts and generalisations and the testing of the implications of these concepts in new situations. Kolb suggested that pairs of these activities may be represented as polarities with a dialectical tension between concrete experience and abstract conceptualisation (a comprehension dimension) and between reflective observation and

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