Macrothink Institute™

International Journal of Linguistics
ISSN 1948-5425
2012, Vol. 4, No. 3

The Relationship between Thinking Styles and Metacognitive Awareness among Iranian EFL Learners

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Received: July 6 2, 2012 Accepted: August 6, 2012 Published: September 1, 2012

doi:10.5296/ijl.v4i3.2061 URL: http://dx.doi.org/10.5296/ijl.v4i3.2061

Abstract

Throughout the recent decades, within the realm of educational psychology, learners' thinking styles and metacognitive awareness as influential factors on learning and thinking have received considerable attention. The present study explored the relationship between thinking styles and metacognitive awareness of Iranian EFL university students majoring in English Literature, English Translation, and English Language Teaching. In addition, the study pursued whether thinking styles could act as the predictors of metacognition. Thinking Styles Inventory (TSI) and Metacognitive Awareness Inventory (MAI) were administered at 100 Iranian senior undergraduate EFL students at the University of Sistan and Baluchestan and Islamic Azad University of Zahedan. The reliability of TSI and MAI was confirmed, and the analysis of data through Pearson product-moment correlation coefficient indicated that functions and levels of thinking styles were positively correlated with metacognitive awareness. Moreover, significant positive correlations were found between hierarchical, anarchic, and external styles and metacognitive awareness. However, results manifested no significant relationship between monarchic, oligarchic, and conservative styles and metacognitive awareness. The analysis of data also showed positive and significant

relationship between the two scopes of thinking styles, namely internal and external, and knowledge of cognition as one of the components of metacognition, whereas merely external style was positively and significantly correlated with the other component of metacognition called regulation of cognition. Furthermore, regression analysis suggested that executive, hierarchical, and conservative styles could predict metacognition.

Keywords: Thinking styles, Metacognitive awareness, English as a foreign language

1. Introduction

There is no doubt that many EFL students nowadays experience language learning materials and teaching methods that are not in line with their psychological constructs and often deny their natural intelligences and curiosity. Moreover, numerous EFL learners are enforced to acquire discreet bits of knowledge that do not cultivate metacognition and do not correspond to their preferred style of thinking and consequently bring about rote learning. But during the last few decades, understandings of English language learning have developed significantly. In parallel with these developments, increasing attention has been given to educational psychology and learners' psychological constructs. Mangal (2002) states that educational psychology deals with teaching and learning and it can be applied for the purpose of refining the methods, processes and products of teaching and learning in a scientific way. According to Zhang (2004), the theory of mental self-government (MSG) concerns people's thinking styles which are applied to different types of activities including learning. Likewise, Aydin and Coskun (2011) put an emphasis on the significance of mental activities and metacognition, which refers to the awareness and regulation of one's own thinking processes, in the process of learning.

Considering the substantial contribution of psychological factors such as thinking styles and metacognition to the process of learning in general and language learning in particular, the present study aims at investigating the potential relationship between Iranian EFL learners' thinking styles and their metacognitive awareness that appears to have influential impact on EFL students' success. Furthermore, this study examines how well thinking styles are able to predict metacognitive awareness of EFL university students.

1.1 Thinking Styles

A style is a way of thinking and what teachers assume as a difference in EFL students' knowledge of course material may be the diversity of their learning and thinking styles. Further, the reason why many people fail in school and do not succeed in learning is due to how they think (Sternberg, 1997).

The most comprehensive model of thinking styles was established by Robert J. Sternberg as the theory of MSG in 1988. According to the theory of MSG, Zhang and Sternberg (2005) maintained that there are various approaches of governing a society and handling one's own activities which are called thinking styles. To be more precise, thinking styles correspond to the preferred manner of utilizing one's own abilities. As a matter of fact, people select the styles that they find more agreeable to their feelings and tendencies.

In accordance with Sternberg (1997) and Zhang and Sternberg (2005), the theory of MSG consists of thirteen thinking styles falling along five dimensions. Three of these styles of thinking, namely *legislative*, *executive*, and *judicial*, are functions of MSG. Legislative people require creative strategies, whereas executive people work with clear instructions. Individuals with judicial style evaluate the performance of other people. *Hierarchical*, *monarchic*, *oligarchic*, and *anarchic* styles are the forms of MSG theory. Those distributing attention to multiple tasks and prioritizing them possess hierarchical style, and those not

prioritizing their tasks are oligarchic. Besides, monarchic people concentrate on one thing at a time, and anarchic people prefer the tasks that can be accomplished flexibly. The theory of MSG is also comprised of two levels including *global* and *local* thinking styles. Individuals adhering to abstract ideas and to the overall picture of an issue benefit from global thinking style. In contrast, individuals who tend to consider concrete details have local thinking style. Further, *Internal* and *external* styles are the two scopes of the theory of MSG. Internal individuals perform different activities independently. External persons, on the other hand, seek to work collaboratively. The theory of MSG represents two leanings which are *liberal* and *conservative* styles of thinking. Liberal persons like the tasks that involve novelty and ambiguity, where as conservative people stick to the existing rules.

1.2 Metacognitive Awareness

Metacognition is a bridge between areas such as thinking and memory, learning and motivation, and learning and cognitive development (Metcalfe & Shimamura, 1994). Based on Livingston (2003), Metacognition is defined as thinking about thinking. To put it another way, metacognition corresponds to higher order thinking which involves regulating and overseeing the cognitive processes of learning. "Activities such as planning how to approach a given learning task, monitoring comprehension, and evaluating progress toward the completion of a task are metacognitive in nature"(Livingstone, 2003, p.2).

According to Flavell (1987), the term metacognition is associated with knowledge about cognitive issues. John Flavell, the pioneer in the field, attempted to classify it. He created a taxonomy consisting of two key concepts which are *metacognitive knowledge* and *metacognitive regulation.* Metacognitive knowledge, on the one hand, reflects the acquired knowledge about cognitive processes which can be used to control cognitive processes. Metacognitive regulation, on the other hand, refers to employing metacognitive strategies which are sequential processes adopted by learners in order to control cognitive activities. These processes which involve planning and monitoring cognitive activities, as well as inspecting the outcomes of those activities aid in regulating any type of learning like English language learning.

2. Literature Review

Multiple research projects have been conducted to investigate the relationship between Sternberg's thinking styles and some other factors in academic research samples (e.g. Grigorenko & Sternberg, 1997; Kadivar & Shokri, 2008; Weiqiau & Zhang, 2009; Zhang, 2000, 2001, 2002, 2010b; Zhu & Zhang, 2011). Some of the research projects delved into the concept of thinking styles and academic achievement. As an illustration, Zhang and Sternberg (1998) examined thinking styles, abilities, and academic achievement among 622 Hong Kong university students. The analysis of data revealed the predictive power of thinking styles for academic achievement over and above abilities. In addition, different relationship between male and female students' academic achievement with their analytical thinking style was found.

Developing metacognition is indispensible for academic attainment. From the earliest research into metacognition, learning and metacognitive awareness were associated since the goal of metacognition is regulating and directing learning. Furthermore, the majority of investigations into classroom interventions which incorporate metacognition as a part of their programs consider the impact of metacognitive training on EFL learners' academic success (Coutinho, 2007; Kassaian & Ghadiri, 2011; Mohammadi Ghavam, Rastegar, & Razmi, 2011; Negretti & Kuteeva, 2011; Sheorey & Mokhtari,2001; Vandergrift, 2005; Zhang & Wu, 2009). In a study Zhang (2010a) probed into the contributions of thinking styles to metacognition beyond self-rated abilities. A total 424 university students, majoring in Biology, Education, and Finance, filled out the Chinese version of Thinking Styles Inventory-Revised II (TSI-R2) and MAI. Results demonstrated that thinking styles made unique contributions to metacognition, and legislative, judicial, executive, and liberal styles were the most critical contributors.

As can be perceived, metacognition and thinking styles have been the subject of much research. However, little research has been carried out concerning the thinking styles and metacognitive awareness of EFL university students.

3. Methodology

3.1 Participants

The participants of this study were 100 Iranian senior undergraduate students (78 females and 28 males) studying English Translation, English Literature, and English Teaching at the University of Sistan and Baluchestan and Islamic Azad University of Zahedan. The participants were not chosen randomly since almost all of the senior students at these two universities were the samples of this study.

3.2 Instruments

The following questionnaires were administered in this study to obtain data:

a: Thinking Styles Inventory (Sternberg & Wagner, 1991).

b: Metacognitive Awareness Inventory (Schraw & Dennison, 1994).

3.2.1 Thinking Styles Inventory

The Thinking Styles Inventory (TSI), designed by Sternberg and Wagner (1991), is a self-report questionnaire consisting of 104 items. The inventory involves 13 subscales, with 8 items on each subscale. The participants rated themselves on a seven-point Likert scale ranging from *not at all* the statement is true about me to *extremely well* the statement represents my performance. Good reliability and validity have been obtained for TSI in different occasions and cultures. Sternberg and Wagner collected norms for various age groups, and for their college sample, the median reliability for subscales was .78. Sternberg (1994) found five factors for TSI which accounted for 77% of the variance. This five-factor model corresponded to the five dimensions of the theory of MSG reviewed earlier.

3.2.2 Metacognitive Awareness Inventory

The Metacognitive Awareness Inventory (MAI), developed by Schraw and Dennison (1994), includes 52 items which assess various facets of metacognition. Items of MAI are under two categories: Knowledge of cognition and regulation of cognition. Eighteen items of the MAI measure knowledge of cognition, and the remaining thirty four items assess regulation of cognition. The responses are on a five-point Likert scale ranging from *never or almost never true of me* to *always or almost always true of me.* Different studies have supported the satisfactory reliability and validity of the inventory. The internal reliability for the knowledge of cognition scale varied from the low .70s to the high .80s and for the regulation of cognition scale varied from the low .80s to the low .90s. For the entire inventory, the internal reliability was .90 (Schraw & Dennison, 1994; Sperling, Howard, Staley, & DuBois, 2004; Zhang, 2010a). The validity of the MAI was substantiated by Schraw and Dennison (1994) who performed a two-factor solution on the data. The result supported two factors accounting for 65% of the sample variance.

3.3 Data Collection

The two questionnaires (TSI and MAI) were administered at the senior EFL university students majoring in English Literature, English Translation, and English Teaching. The participants were given oral description of the objectives of the questionnaires. Participants were given 45-50 minutes to respond, and they were ensured that the obtained data would be kept confidential and would not influence their course final scores in order to prevent any anxiety or stress.

4. Results

4.1 Reliabilities of Thinking Styles Inventory and Metacognitive Awareness Inventory

The descriptive statistics and the alpha coefficients for the total scales and all subscales are shown in Table 1. The calculated Cronbach's alphas denote the satisfactory internal consistency of the TSI and MAI subscales among senior EFL university students in the context of Iran.

Table 1. Descriptive Statistics and Cronbach's alphas for TSI and MAI scales (N=100).

Variables	Minimum	Maximum	Mean	SD	A
TSI					
Legislative Style	17.00	55.00	38.9000	8.40454	0.78
Executive Style	16.00	54.00	40.4400	8.60505	0.85
Judicial Style	19.00	55.00	38.2200	9.34478	0.86
Monarchic Style	18.00	50.00	34.3800	7.65649	0.63
Hierarchic Style	20.00	56.00	41.5600	8.00671	0.85
Oligarchic Style	19.00	50.00	33.7600	6.85804	0.63
Anarchic Style	9.00	56.00	33.8600	7.89453	0.73
Global Style	8.00	56.00	33.1400	8.97248	0.86

Local Style	8.00	50.00	34.0800	8.12613	0.78
Internal Style	9.00	54.00	31.9500	10.10688	0.88
Liberal Style	18.00	56.00	40.4100	8.99842	0.89
Conservative Style	11.00	51.00	29.0500	8.92887	0.88
External Style	12.00	56.00	37.2000	9.99798	0.92
Total TSI					0.93
MAI					
Knowledge of Cognition	35.00	83.00	62.7800	8.93928	0.86
Regulation of Cognition	71.00	174.00	126.590	18.79668	0.92
Total MAI					0.95

4.2 The Relationship between Thinking Styles and Metacognition

To examine the relationship between the subscales of thinking styles and metacognitive awareness, zero-order Pearson product-moment correlation coefficients were conducted (Table 2). The results manifested significant positive relationship between functions and levels of thinking styles and metacognitive awareness. Hierarchic, anarchic, and liberal styles had significant positive correlations with metacognitive awareness. Furthermore, internal, external, and liberal styles were positively and significantly correlated with knowledge of cognition, whereas only external and liberal styles showed significant positive correlations with regulation of cognition. However, no significant correlation was found between monarchic, oligarchic, and conservative styles and metacognitive awareness.

Table 2. Pearson Correlation between Thinking Styles and Metacognitive Awareness Scales

	Scales	Knowledge of Cognition	Regulation of Cognition
Functions	Legislative style	.337**	.324**
	Executive Style	.504**	.632**
	Judicial Style	.357**	.385**
Forms	Monarchic Style	.189	.177
	Hierarchic Style	.556**	.590**
	Oligarchic Style	.162	.173
	Anarchic Style	.330**	.388**
Levels	Global Style	.280**	.256*
	Local Style	.225*	.252*
Scopes	Internal Style	.204*	.090
	External Style	.235*	.310**
Leanings	Liberal Style	.392**	.512**
	Conservative Style	.071	-.044

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

4.3 Thinking Styles as the Predictors of Metacognition

Standard multiple regression was run to determine the extent to which metacognition could be predicted by thinking styles. The 13 thinking styles were entered into the regression model simultaneously. The data analysis revealed that both metacognitive scales were significantly predicted by the executive and hierarchical thinking styles. What is more, executive style was the first significant positive predictor for regulation of cognition and the second significant positive predictor for knowledge of cognition. Moreover, the first and second significant positive predictor for knowledge of cognition and regulation of cognition respectively was hierarchical thinking style. In addition, conservative thinking style served as the third predictor for regulation of cognition which negatively predicted this level of metacognition. To be more specific, both executive and hierarchical thinking styles accounted for 42% of variance in knowledge of cognition. And hierarchical, executive, and conservative styles together explained 53% of variance in regulation of cognition. The nature of the prediction of metacognitive awareness from thinking styles is presented by the β weights for each significant predictive relationship. The summary of the results is given in Table 3.

Table 3. Predicting metacognition from thinking styles (N=100).

Metacognitive Awareness Scales	*Knowledge of Cognition*	*Regulation of Cognition*
R^2 Thinking styles	.42	.53
β Style 1	.277* Hierarchical	.427*** Executive
β Style 2	.276* Executive	.218* Hierarchical
β Style 3		-.189* Conservative
F	4.940***	7.613***
Df	99	99

*p < .05; **p < .01; ***p < .001

5. Discussion

This study aimed at examining the relationship between thinking styles and metacognitive awareness of EFL learners. Besides, the contribution of thinking styles to metacognitive awareness was assessed. Initially, reliability estimates provided detailed insight about the internal scales reliability among Iranian EFL university students and in comparison with previous research studies implementing the same measures with other samples (e.g. Grigorenko & Sternberg,1997; Schraw & Dennison, 1994; Sendurur, Sendurur, Mutlu, & Baser, 2011; Tok, Ozgan, & Dos, 2010; Weiqiao & Zhang,2009; Zhang, 2001,2002, 2010b), TSI and MAI showed similar and acceptable reliabilities proving the internal consistency of the inventories.

Regarding the relationship between thinking styles and metacognitive awareness, functions, levels, scopes, two forms of thinking styles (hierarchical and anarchic) and one leaning of thinking styles (liberal) showed statistically significant positive relationships with knowledge of cognition. These findings gave the indication that from among all styles of thinking, only conservative, oligarchic, and monarchic styles displayed no significant relationship with knowledge of cognition respectively. To illustrate, conservative students displayed the weakest knowledge of cognition probably because they like to be ushered and be given a

picture of all steps and precise instructions for carrying out every task. Thus, they are not metacognitively aware probably because they are not inclined to reflect upon and plan how to finish their assignments by themselves. By the same token, oligarchic students, who tend to initiate several projects simultaneously but cannot complete them because of the shortage of time and the difficulty in setting priorities, lack metacognitive awareness. This finding is meaningful since metacognitively aware individuals are able to prioritize their tasks and can regulate their time in order to fulfill their tasks. Likewise, monarchic people exhibit tendency for a single goal and a single way of doing things which is in contrast with high levels of metacognition. That is to say, individuals who are metacognitively aware are capable of concentrating on multiple tasks and can assess and prioritize them. Internal style, which was significantly correlated with knowledge of cognition, did not show any significant relationship with regulation of cognition. This finding indicates that internal people, preferring to accomplish their tasks individually rather than collaboratively, may have good knowledge of cognition; however, they may not be as successful as the external in regulating what and how they do a task.

The findings of the present study are in line with Borkowski, Peck, Reid, and Kurtz (1983), Meichenbaum and Goodman (1969), and Palladino, Poli, Masi, and Marcheschi (1997) investigating the relationship between cognitive styles and metacognitive processes. Their results revealed that children with reflective cognitive style utilized metacognition more than those with impulsive style.

Considering the results of multiple regression analysis, executive, hierarchical, and conservative styles made unique contribution to the processes of metacognition. Totally, thinking styles explained 42% of variance in knowledge of cognition and 53% of variance in regulation of cognition. These substantial magnitudes confirmed the meaningfulness of the findings.

The hierarchical style was the first most important predictor for knowledge of cognition and the second most important predictor for regulation of cognition. These findings make sense since students with hierarchical style reflect tendency for setting multiple goals with different priorities and devote more time and energy to them. So they require knowledge of what to do and how to perform and regulate different activities in order to be able to finish them.

The executive style was the first most important predictor for regulation of cognition and the second most important predictor for knowledge of cognition. As it was expected, students with executive style benefit from high levels of metacognition because they are always ready for the class, for doing the assigned activities, and for solving the problems posed by others. Therefore, individuals with high levels of metacognitive awareness make use of executive and hierarchical thinking styles most of the time.

The signs of the beta weights signal the negative contribution of conservative style to regulation of cognition which was consistent with our expectations. As noted earlier, conservative students adhere to existing rules and similar situations. Also, they have tendency towards explicit instructions of others for performing their tasks. To make the point, such

individuals do not feel the need for directing and governing what they do and how they perform.

These results are in line with the findings revealed in a study investigating the contribution of thinking styles to metacognition beyond self-rated abilities (Zhang, 2010a). As reviewed earlier, Zhang (2010a) pointed out that hierarchical, legislative, executive, and liberal styles were the positive predictors for knowledge of cognition respectively. In the case of regulation of cognition, hierarchical, liberal, and executive styles acted as the positive predictors. The analysis of data in the present study reinforced the critical contribution of hierarchical and executive styles to metacognition. Inconsistent with the findings of Zhang (2010a), conservative thinking style made significant and negative contribution to regulation of cognition in this study.

The present study comprised some limitations. First, the findings of this research project were obtained merely through self-reported data which might not be as precise as the data collected through behavioral measures. Second, the specific sample of Iranian senior university students was small and not obtained through a random sampling procedure which restricted the generalisability of the results. Third, the generalisability of the results was also limited by the adoption of only one measure of thinking styles and metacognition.

Further research studies can use qualitative research tools, namely interviews, observations, think-aloud protocols, and diaries, or adopt different measures of thinking styles and metacognitive awareness with large and random sample.

6. Conclusions and Implications

This research study is an exploration of the relationship between thinking styles and metacognitive awareness of Iranian EFL senior students, and the contribution of thinking styles to metacognition. The psychometric properties of TSI and MAI substantiated the applicability of these two inventories to Iranian undergraduate students. Moreover, this study made a principal contribution to the current literature concerning thinking styles and metacognition. Both teachers and students can benefit from the pedagogical implications derived from the results of this study. Teachers and students have to be aware that human beings possess a profile of thinking styles and utilize their abilities in different ways. An understanding of the existence of different styles of thought encourages teachers to teach via a variety of styles so as to enable all students, regardless of their preferred style, benefit from their instruction. Besides, teachers' awareness of the relationship between thinking styles and metacognitive awareness can induce teachers to provide students with the learning tasks which demand those thinking styles that enhance and cultivate metacognition. What is more, teachers can use a variety of assessment techniques in order to allow different thinking styles. Likewise, when students are equipped with knowledge about the relationship between thinking styles and metacognitive awareness, they can make more conscious effort to boost their metacognitive awareness by fostering creativity-generating and complex thinking styles. In addition to teachers and students, the findings of the present research can be employed by policy makers, who make the chief decisions regarding teaching and learning, in order to direct the operations of textbook writers, curriculum designers, and educators in line with the

disposition of the learners. Furthermore, educational organizations, academic specialists, administrators, university managers, course developers, and language instructors can also be influenced by the results so as to promote executive and hierarchical thinking styles as well as metacognitive awareness among their students. In this way, they can augment the incentive of learners and facilitate the process of language learning for them.

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