

The Validity and Reliability of the Turkish Version of the Metacognitive Awareness Inventory

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Abstract

This study investigated the validity and reliability of the Turkish version of the Metacognitive Awareness Inventory. The sample of the study consisted of 607 university students. Results of language equivalence indicated that the correlations between Turkish and English forms of the MAI were quite high ($r = .93$). As a result of a series of factor analyses eight subscales have emerged under the knowledge and regulation of cognition. These subscales were declarative knowledge, procedural knowledge, conditional knowledge, planning, monitoring, evaluation, debugging, and information management. The internal consistency of the entire inventory was .95. The item-total correlations ranged from .35 to .65 and test-retest reliability coefficient was .95. According to these findings, the Metacognitive Awareness Inventory is a valid and reliable instrument that can be used in the field of education.

Key Words

Metacognitive Awareness, Validity, Reliability, Factor Analysis

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It is important for students to be aware of their strengths and limitations as learners. In last twenty years, metacognition has been receiving increased attention in cognitive psychology. Specific attention has been focused on this construct as the interface between cognition and affect and its essential role in self-regulation in achievement settings (Carrell, Gajdusek, & Wise, 1998; Lucangeli & Cornoldi, 1997). Metacognition itself does not predict achievement, but theorists believe that it may serve as a mediator to learning (Braten, 1991; Bruning, Schraw, & Ronning, 1995). Pintrich & De Groot, 1990). Highly metacognitive individuals do better than others in planning, managing information, monitoring, debugging, and evaluating (Anderson & Walker, 1991; Schraw & Dennison 1994).

The concept of metacognition was introduced by John Flavell in the early 1970s, based on the term metamemory, previously conceived by the same scholar (Butler & Winne, 1995; Campbell, 1999; Delclos & Harrington, 1991). Flavell (1979) regarded metacognition as learners' knowledge of their own cognition, defining it as "knowledge and cognition about cognitive phenomena" (p. 906). Metacognition is often referred to in the literature as 'thinking about one's own thinking', or 'cognitions about cognitions'. It is usually associated with learners' knowledge, awareness, and control of the processes by which they learn (Brown 1987; Garner & Alexander 1989) and the metacognitive learner is believed to be characterized by ability to recognize, evaluate, and where needed reconstruct existing ideas (Blank, 2000; Gunstone, 1991; Wellman, 1985). Though no universally accepted definition of metacognition can be found in the literature, many researchers agree on common fundamental components of metacognition and they suggest that metacognition can be classified into two main components as; knowledge of cognition and regulation of cognition (Brown, 1987; Everson & Tobias, 1998; Flavell, 1987; Forrest-Pressley & Waller, 1984; Mazzoni & Nelson, 1998; Metcalfe & Shimmura, 1994; Nelson & Narens, 1990; Schraw & Dennison, 1994). Knowledge of cognition refers to what individuals know about their own cognition or about cognition in general (Kumar, 1998; Kyllonen & Woltz, 1989). It includes at least three different kinds of metacognitive awareness: Declarative, procedural, and conditional knowledge

(Brown, 1987; Jacobs & Paris, 1987; Schraw & Moshman, 1995). Declarative knowledge refers to knowing “about” things. Procedural knowledge refers to knowing “how” to do things. Conditional knowledge refers to knowing the “why” and “when” aspects of cognition. Regulation of cognition refers to a set of activities that help students control their learning (Gavelek & Raphael, 1982; Gourgey, 1998; Hartman, 1998). Although a number of regulatory skills have been defined in the literature, three basic skills are included in all accounts: Planning, monitoring, and evaluation (Fraenkel & Wallen, 2000; Jacobs & Paris, 1987). “Planning involves the selection of appropriate strategies and the allocation of resources that affect performance. Monitoring refers to one’s on-line awareness of comprehension and task performance. Evaluation refers to appraising the products and efficiency of one’s learning” (Schraw, 1998, p. 115).

In sum, metacognition is an important construct that influences individuals’ learning processes. Since they have intense learning tasks, it is essential for today’s university students that they have planning, controlling, and evaluating skills about themselves. These activities are metacognition in nature. Therefore, determining metacognitive levels is an important issue for university students. However in our country there is no inventory that assesses college students’ metacognitive awareness. Therefore, the aim of this research is to translate the Metacognitive Awareness Inventory (Schraw & Dennison, 1994) to Turkish and to examine psychometric properties of the Turkish version. The MAI is a 52-item self-report inventory and each item is rated on 5-Point Likert-type scale which ranges from “1-always false” to “5-always true” to report respondents’ level of agreement with the 52 items. High scores indicate strong agreement. The MAI takes approximately twenty minutes to complete.

Method

The sample of study consisted of 607 university students who were enrolled in different programs at Sakarya University, Turkey. These programs were computer education and instructional technologies ($n=112$), pre-school education ($n=76$), psychological counseling and guidance ($n=88$), elementary school education ($n=107$),

social science education ($n=115$), and Turkish language ($n=109$). Of the participants, 297 were female; 310 were male. The mean age of the participants was 20 years. In this study, exploratory factor analysis was performed to examine the factor structure of the scale according to the data obtained from the Turkish students. Also concurrent validity, re-test and internal consistency reliabilities, and item analysis of the inventory were examined.

Results

First, the English form of the MAI was translated into Turkish and back translated to English by 25 English teacher. Then, they examined the congruence between the Turkish and English forms and made some corrections. Finally, experts discussed the Turkish form of the MAI and along with some corrections this scale was prepared to use. Before the validity and reliability analyses, the Turkish form of the MAI was examined, as content validity, by three academicians who were experts in the field of educational sciences and according to their views some corrections were made. To examine the equivalency between the original and Turkish inventories, both forms are administered to 86 English teachers, with interval of one week, respectively. The correlation between the English and Turkish versions is found to be .93 for entire inventory, .96 for declarative knowledge, .94 for procedural knowledge, .96 for conditional knowledge, .95 for planning, .96 for monitoring, .97 for evaluation, .96 for debugging, and .97 for information management. These results confirm that the Turkish and English versions of the scales might be regarded equivalent.

Results of exploratory factor analysis have demonstrated that the items loaded on eight factors under the knowledge of cognition and regulation of cognition dimensions. These eight factors were; declarative knowledge, procedural knowledge, conditional knowledge, planning, monitoring, information management, debugging, and evaluation. Factor loadings ranged from .49 to .72 for declarative knowledge, .36 to .63 for procedural knowledge, .35 to .74 for conditional knowledge, .38 to .65 for planning, .32 to .83 for monitoring, .35 to .70 for evaluation, .32 to .55 for debugging, and .32 to .75 for information management. For concurrent validity, the relationship between the Metacognitive Awareness Inventory

(Yurdakul, 2004) and the MAI (Schraw & Dennison, 1994) which was translated into Turkish in this study was calculated. This result also showed that there was a high relationship between two inventories ($r = .95$).

The internal consistencies of the MAI, was found .95 for the entire scale, and for subscales were found ranged between .93-.98. Findings also demonstrated that the corrected item-total correlations ranged from .35 to .65. For each factor and each item, the differences between mean scores of upper 27 % and lower 27 % groups are significant. Test-retest reliability coefficient of MAI over three-week period was .95.

Discussion

The aim of this research was to translate the MAI into Turkish and to examine its psychometric properties. Overall findings demonstrated that this scale had acceptable to high validity and reliability scores. So, this inventory can be named as a valid and reliable instrument that could be used in the field of education. However, because participants were university students, examination of the factor structure of the MAI for targeting other student populations should be made. Finally, to examine the original inventory's factor structure in Turkish culture, a confirmatory factor analysis study should be performed.

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