AERA Proposal Summary

Motivation and Self-Regulated Learning,
The Motivated Strategies for Learning Questionnaire: An Instrument for the General Curriculum Level?

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Abstract

The *Motivated Strategies for Learning Questionnaire* (MSLQ) is a widely used self-report instrument to measure student motivation and self-regulated learning strategies at the course-specific level (i.e. an individual course or subject domain). The present study sought to explore the utility of the MSLQ in measuring student motivation and self-regulated learning strategies at the general school level (i.e. all courses and subjects taken together) rather than the course-specific level. To that end, the instrument was slightly modified and administered to freshman polytechnic students (*N* = 1,166) in Singapore. The construct and predictive validity of the instrument were determined using confirmatory factor analysis and by correlating the individual scales of the instrument with the overall semester grades. Results showed that the modified MSLQ is a reliable and valid instrument to determine student motivation and self-regulated learning strategies at the general school level.

**Keywords:** Motivated Strategies for Learning Questionnaire, Student Approaches to Learning, Motivation, Self-Regulated Learning, Structural Equation Modeling.
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Within educational psychology there are two general approaches to study student motivation and learning. On the one hand there is the Student Approaches to Learning (SAL) and on the other the Self-Regulated Learning (SRL) approach. A key difference between the two approaches is the detail of measurement, or “grain size” of the instruments used to assess student learning (Lonka, Olkinuora, & Mäkinen, 2004). Generally, grain-size refers to the number of constructs an instrument is intended and designed to measure within a given learning context; the more constructs, the smaller the grain size of the instrument. SAL instruments are based on a holistic approach to describe general conceptualizations of learning (i.e. a larger grain size), whereas the SRL instruments are designed to measure students’ motivational beliefs and the use of self-regulated learning strategies at the course-specific level (i.e. an individual study course or subject domain, thus a smaller grain size). Both approaches have their advantages; SAL instruments provide valuable information about students’ general learning orientations and study approaches, whereas SRL research provides insights in students’ context-specific self-regulatory learning capabilities.

The objective of the present study was to reconcile both approaches by combining the positive features of both SAL and SRL perspectives. With the present study we investigated whether it is possible to use a combined approach by using a highly detailed SRL instrument to measure students’ general motivational beliefs and the use of self-regulated learning strategies at the general curriculum level. To that end, we used the Motivated Strategies for Learning Questionnaire, or MSLQ (Pintrich, Smith, Garcia, & McKeachie, 1991) and tested whether it is capable of measuring student motivation and self-regulated learning strategies pertaining to the general curriculum level. Until now, the MSLQ has exclusively been used at the course-specific level with a focus on situational factors that influence student motivation and learning. Our study was based on the assumption that student motivation and learning strategies are not necessarily limited to situational, contextual condition but that students may have fairly stable dispositional self-regulated learning strategies that can be observed at the curriculum level as well. This assumption was based on findings from previous studies that compared the use of learning strategies between different subject domains. The findings suggest, that besides some small variations, students have rather stable patterns of learning strategies when comparing them across different subject areas (Vermetten, Lodewijks, & Vermunt, 1999; Wolters & Pintrich, 1998). For the purpose of administering the MSLQ at the curriculum level we slightly modified the wordings of several items and administered the modified MSLQ to 1166 polytechnic students in Singapore. The data were analyzed using confirmatory factor analysis to test whether the factor structure of the modified MSLQ remains stable when administering it at the general curriculum level.

The MSLQ is an 81-item, self-report instrument consisting of 6 motivation scales and 9 learning strategy scales (Pintrich et al., 1991). The motivational scales
consist of the subscales self-efficacy, control of learning beliefs, intrinsic goal orientation, extrinsic goal orientation, task value beliefs and test anxiety. The learning strategies section consists of the subscales rehearsal, elaboration, organization strategies, critical thinking, metacognitive self-regulation, time and study management, effort regulation, peer learning and help-seeking.

The MSLQ has shown to be a reliable and valid instrument (Pintrich, Simith, Garcia, & McKeachie, 1993; Pintrich et al., 1991) that has been used in a variety of studies across various courses, content areas and countries (Bandalos, Finney, & Geske, 2003; Brookhart & Durkin, 2003; Ommundsen, 2003; Seibert, 2002; Zusho, Pintrich, & Coppola, 2003). The MSLQ can be used either in its entirety or its subscales and has most frequently been applied to evaluate the motivational and cognitive effects educational programs have on students (Bong, 2004; Bong & Hocevar, 2002). The MSLQ has however not yet been used at the curriculum level to determine students’ general motivational beliefs and self-regulated learning strategies.

Method

The sample consisted of 1166 participants (44% male and 56% female) with an average age of 17.40 years ($SD = .93$). The majority of the participants (96%) were Singaporean citizens; the remaining participants came from China, India, Indonesia, Japan, Malaysia, Myanmar, Philippines, Sri Lanka and Thailand. During the freshmen orientation program at the polytechnic all first-year students were administered the MSLQ (Pintrich et al., 1991). Several of the original items were modified to enable measurement of motivation and learning strategies at the curriculum level. The modification was done with the intent to minimally alter the items to assure a close resemblance to the original MSLQ. For instance, all items referring to a ‘course’ were altered to fit the more general context of a ‘School’ or ‘Polytechnic’ (e.g. item 12: “I’m confident I can learn the basic concepts taught in this course” was altered to “I’m confident I can learn the basic concepts taught at the Polytechnic”).

For the purpose of our analyses, we clustered the items of the modified MSLQ in groups of two based on semantic overlap. This technique is called “item parceling” (Bandalos & Finney, 2001; Little, Cunningham, Shahar, & Widaman, 2002). Item Parceling is a measurement practice that is commonly used for latent variable analysis. According to Little (2002), a parcel can be defined as an aggregate-level indicator, comprised of the sum or average of two or more items. For the modified MSLQ a total of 36 parcels were formed (10 for the motivation section and 26 for the learning strategies section).

In order to determine the predictive validity of the modified MSLQ we correlated the scores of the MSLQ scales with the overall semester grade, the English grade and the Mathematics grade. The overall semester grade is the aggregated mean score, based on all five module grades of a common first semester at the polytechnic (all students had to complete a English, Mathematics, Science, Enterprise skills, Cognitive learning course).

The data were analyzed using a Structural Equation Modeling approach. The analysis was done with AMOS 5 (Arbuckle, 2003). The two sections of the MSLQ were analyzed separately. Thus, two confirmatory factor analyses were conducted: one for the set of motivation items and another for the set of learning strategies items.
Parameter estimates were generated using maximum likelihood and tests of goodness of fit. Chi-square accompanied by degrees of freedom, sample size, p-value and the root mean square error of approximation (RMSEA) were used as indices of absolute fit between the models and the data.

As a reliability measure, Hancock’s coefficient \( H \) was calculated for each scale. The coefficient \( H \) is a construct reliability measure for latent variable systems (see Hancock & Mueller, 2001).

**Results and Discussion**

Testing the measurement model revealed that the factor structure of the MSLQ fitted the data well. All parcel loadings (i.e. regression weights) were significant at the .01 level and ranged from .29 (Time and Study Environment Management) to .85 (Self-Efficacy for Learning and Performance), which is indicative of an adequate construct validity of the 13 scales of the instrument.

Correlation and covariance matrices were calculated for all input variables. Covariance matrices were used to perform maximum likelihood linear structural relations analyses. The results demonstrate that the data fitted the motivation and learning strategies models well. The Chi-square/df ratio for the motivation section was 3.79, \( p < .00, N = 1166, \) RMSEA = .05 and CFI = .98. Also, the learning strategies section fitted the data reasonably well: The Chi-square/df ratio was 4.63, \( p < .00, N = 1166, \) RMSEA = .06 and CFI = .91.

These findings are in agreement with an earlier study conducted by Pintrich et al. (1993) at the course-specific level. In fact, when comparing the model fit statistics used in the Pintrich et al. “reliability and predictive validity study” (Pintrich et al., 1993) one can see that our data fitted the model even better. In the Pintrich et al. study the goodness-of-fit and adjusted goodness-of-fit indices (GFI and AGFI) as well as the root mean residual (RMR) were used as model fit indices. A GFI and AGFI of .90 or greater and an RMR of .05 or less are heuristic values that indicate an adequate model fit. Table 1 provides and overview of the comparison between our findings and the findings from Pintrich et al.

*Table 1: Comparison of the Goodness-of-Fit Index, the Adjusted Fit Goodness-of-Fit Index and Root Mean Residual between the Pintrich et al. (1993, pp.807-809) Study and the Findings of the Present Study.*

<table>
<thead>
<tr>
<th>Scale/Index</th>
<th>Pintrich et al. study</th>
<th>Present study</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Motivation Section</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GFI</td>
<td>.77</td>
<td>.94</td>
</tr>
<tr>
<td>AGFI</td>
<td>.73</td>
<td>.92</td>
</tr>
<tr>
<td>RMR</td>
<td>.07</td>
<td>.03</td>
</tr>
<tr>
<td><strong>Learning Strategies Section</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GFI</td>
<td>.78</td>
<td>.86</td>
</tr>
<tr>
<td>AGFI</td>
<td>.75</td>
<td>.84</td>
</tr>
<tr>
<td>RMR</td>
<td>.08</td>
<td>.04</td>
</tr>
</tbody>
</table>
The reliability of the 13 scales was assessed using the coefficient $H$, which represents the degree of replicability of a construct based on its measured indicator variables. Values ranged from .52 (Peer learning) to .86 (Self-efficacy for learning and performance). The values are indicative of a moderate to good internal consistency of the motivation and learning strategies scales.

Concerning the predictive validity of the MSLQ for the curriculum level, the results of the correlational analyses revealed that the instrument is capable of predicting the overall semester grade reasonably well. Although the correlations between MSLQ scores and the final overall semester grade were rather moderate (between .10 and .17), they were all statistically significant at the .05 level, except for the ‘extrinsic goal orientation’ subscale. These findings were similar to the results found with the course-specific MSLQ (Pintrich et al., 1993). The differences we found in strengths of correlations between the MSLQ scores and the English and Mathematics course grades suggest that the modified MSLQ is capable of distinguishing between subject domains. This context sensitivity seems to be related to the grain-size of the instrument. Stated differently, despite the fact that the MSLQ was administered at the curriculum level we were able to pick up variations in correlations between different courses. Although this explanation needs to be tested in further studies, the results do add to the overall validity of the MSLQ.

Overall, our results showed a good model fit between the tested models and the data indicating that the modified MSLQ is a valid instrument to determine student motivation and self-regulated learning strategies at the curriculum level.

**Significance of the Findings**

Considering the practical implications of our findings, the modified MSLQ can be considered as an alternative instrument to existing SAL-based self-report instruments like the Approaches to Studying Inventory (Entwistle & Ramsden, 1983) or the Study Processes Questionnaire (Biggs, Kember, & Leung, 2001) in measuring student motivation and learning strategies at the curriculum level. The advantage of using the modified MSLQ may be its greater grain-size. As Entwistle and McCune (2004) pointed out in their comparison of SRL and SAL instruments, the scales of the MSLQ cover a larger number of motivational, cognitive and study resource management related constructs than most of the SAL instruments. This difference in grain-size may prove beneficial in providing educational researchers with more detailed information about students’ self-regulatory capabilities at the general curriculum level as compared to other SAL instruments.
References
