The value of assessing pupils' academic self-concept*

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* Robert L. Burden, emeritus Professor, University of Exeter, had an active role in an early version of the article. However, he died in the spring 2014, without being able to complete the work with us. We dedicate the article to him in memory of his work on the Myself-as-a-Learner Scale.

Abstract

The Myself-As-a-Learner scale (MALS) has been constructed to assess academic self-concept (Burden 2000; 2012). The scale consists of 20 self-referring statements to which individuals are invited to respond in a positive, negative or neutral manner. A Norwegian translation showed to be an internal consistent tool for the schools. The reliability and validity were explored in a sample of 84 monolingual children in which all children were assessed twice with a time difference of about eight months. Compared to a control group (N=31) we found no significant effect of participation in the vocabulary training study on the children's academic self-concept. Instead we found that high achievers evaluated themselves more positively over time, while low achievers evaluated themselves more negatively in the same period.

Key words: MALS, Academic self-concept, Reading, Vocabulary, Low-achievers

Introduction

One of the most contentious issues in self-concept research and theory is how to define the construct. Rosenberg (1965) focused on self-concept as a global measure, often referred to as General Self Concept, while others consider the ways in which specific sub areas all interact in a hierarchical system such as one's views about one's academic abilities, one's social interactions, and one's bodily self-image (Shavelson, Hubner, & Stanton, 1976). On the whole, most widely used self-concept scales, such as those by Marsh (1992) and Harter (2001) tend to take a cumulative approach, providing a means of examining a person's view of themselves and their attributes in various sub-areas, all of which are considered to contribute to the general self-concept. Unfortunately, this can also mean that the scales themselves, whilst fairly long and time consuming, may only provide a short number of items devoted to any one area. In addition, research concerning the weighting of specific components in comprehensive models of self-concept seemed problematic (Marsh, 1992). On this background some researchers have constructed questionnaires that focus more explicitly on specific areas such as academic self-esteem (Lawrence, 2006) or academic self-concept (Burden, 1998; 2005) with no relation to a comprehensive or an accumulated common factor of self-concept.

As a result of his own studies, Burns (1982:126) concluded that '*children whose self-concepts do not include the view that they can achieve academically, tend to fulfil that prediction'*. Subsequent research in a multitude of studies has borne this out (see, for example, Fairhurst and Pumfrey, 1992; Frederickson & Jacobs, 2001). Moreover, the importance of focusing on domain-specific self-perceptions rather than on global self-esteem has been emphasised in many other studies (e.g. Skaalvik & Hagtvet, 1990; Carr, Borkowski, & Maxwell, 1991). The way in which scores in these different domains interact, particularly with regard to different school subjects, is clearly shown in the self-concept scales of Marsh (1992) and of Harter (1985). It should be noted, however, that what these studies and many others tend to show is the existence of an association between self-concept and academic achievement in the nature of 0.3 to 0.4, but this does not necessarily indicate causality. A study by Muijs (1997) is an example of an investigation that takes this into account and concludes that self-concept is likely to act as a mediating variable between general academic ability, as measured by

cognitive tests and academic achievement in various domains, but may be more likely to function as a result of high achievement than as a contributing factor.

The Myself-As-a-Learner-Scale (MALS) was constructed by Burden (1998) as an alternative approach to more global measures of self-concept, focusing explicitly on the relation between school students' academic self-concepts and school achievement. Original and follow-up standardisation studies of the MALS with UK students have shown the scale to be robust with high reliability and strong validity (Burden, 2012). It has therefore been used increasingly widely in a number of educational research studies as a means of providing additional predictive and outcome-based data.

As the MALS has continued to arouse considerable interest in its applicability to the specific learning self-concepts of students, it was decided to examine more closely how well it translated into the Norwegian context. In particular, the complex nature of the relationship between academic self-concept (MALS), verbal and non-verbal ability, and reading attainment were examined in the context of a vocabulary training study in a pre-post design. As a result of the growing awareness of the central role played by a person's self-concept in contributing to motivation and achievement in schools, there is a need for more valid and reliable instruments to be made available for teachers, psychologists and researchers. Numerous learning experiences over time may contribute to how a child thinks about him/herself as a learner. In addition, these experiences might be dependent on basic verbal and nonverbal skills which play key roles in schoolwork and may contribute to success or failures in the educational setting. One way of validating the MALS, therefore, is to explore the associations between test scores on standardized instruments of basic verbal skills and the MALS scores as part of a training study. This kind of validation was not performed with the English version of the scale.

With this in mind, we considered that in validating the content of the scale it was important to investigate how the results on the scale are related to background factors of the participants in the training study. Background factors such as verbal and non-verbal abilities measured by general cognitive tests are factors which underlie academic performance at different areas of performance at school. We expected these general cognitive factors to explain a significant amount of the difference in development between children in this study, both regarding vocabulary development, reading and spelling as a result of training. In addition we expected to find a systematic relation between level of accomplishment in development and academic

self-concept. We therefore elaborated the following hypotheses for this part of the training study and with a special focus on vocabulary learning:

Hypothesis 1: We expect that cognitive factors such as language comprehension, reading comprehension and problem solving are indirectly related to academic self-concept. This might mean that success in vocabulary learning is depending on these cognitive skills. Next, the level of development of these skills might determine the development of academic self-concept. This is in line with Muijs (1997: 274), who found a significant relation between academic achievement and academic self-concept.

In trying to dissolve the question of dynamic changes in self-concept over time, the following hypothesis was also formulated:

Hypothesis 2: As a continuation of the study of Muijs (1997) who concluded that self-concept is mostly seen as a result of achievement rather than as a contributing factor to achievement, we further hypothesize that low performing children run the risk of lowering their academic self-concept over time, while high performing children tend to increase their academic self-concept.

Method

Design

The MALS (Burden, 2012) was first translated into Norwegian and subsequently used in an experimental design, implementing vocabulary training programs at different grade levels. The effect of the training program has been measured pre-post, and the results presented in Frost et al. (2014) and in Frost, Ottem, Hagtvet, & Snow (2015). However, at pre and post-times the MALS questionnaire was used in order to examine the impact of the intensive training program on the academic self-concept of children at different grade levels and compared to a control group of pupils that did not participate in the vocabulary training program.

Sample and materials

The translation of MALS was administered to a sample of 115 monolingual pupils at two schools in Oslo. The pupils at one school received intensive vocabulary training (N=84) while pupils at the other school served as controls (N=31). Mean age at the first administration of the scale was 147 months and mean age at the second administration was 155 months. The full sample consisted of 59 boys and 56 girls. As in the original version of the MALS, the respondents were required to read each of 20 statements relating to themselves as learners and problem-solvers, and to circle one of five alternative possible responses, ranging from 1 to 5. The scores were then altered to raw scores reflecting positive responses.

Table 1 is an overview of the mean raw scores obtained by the participants on the first and second administration of the MALS. In addition, 114 children had been assessed with the Raven's Matrices nonverbal test (Raven, Court, & Raven, 1986) at the time of the MALS pre-test. Data from a test of sentence reading (S40) (Høien, Tønnesen, & Igland, 2008) were available from 108 children. Moreover 113 children were assessed with the BPVS (Dunn, Dunn, Whetton, & Burley, 1997). Independent sample t-tests revealed no significant difference between the experimental and control groups on any of the variables.

Insert Table 1 here

Statistical analyses

As a first step Cronbach's alpha was used to examine the reliability of the MALS using a split-half procedure based on 20 items from the MALS pre-test data and 20 items from the post-test data. Next, a MANCOVA analysis was carried out to explore the effect of vocabulary training on academic self-perception. Finally, two-step cluster analysis was used to explore dynamic changes in the data from the time of the pre-tests to the time of the post-tests.

Reliability

One important aspect of the reliability of the MALS is the internal consistency of the items in relation to each other. The correlations between the forms were .64. In part 1 Cronbach's Alpha was .85, and in part 2, Cronbach's Alpha was .78.

Correlations

If the MALS is a valid instrument, it ought to be associated with academic performance in general. Table 2 shows the correlations between the MALS and other instruments used in the study. It can be seen that all instruments correlate with the MALS pre- and posttest results at the .01 level or less. These correlations support the view that academic self-concept is associated with a person's verbal, nonverbal and reading performances.

Insert Table 2 here

Results

In what follows the two hypotheses will be assessed.

Sensitivity to changing self-concept over a period of time. (Hypothesis 2)

The MALS pre-test and post-test data correlate .64 ($p<.001$) indicating that academic self-concept to some extent is stable over time. That is, pupils with high pre-test scores have high post-test scores. However, a correlation of .64 is not particular high, and there could be some dynamic changes in the relation between the pre-test and post-test data. For example, some pupils may evaluate themselves less favourably at the time of the post-test than on the pre-test, while other pupils may evaluate themselves more favourably at the post-test than at the time of the pre-test.

One way of approaching the problem of dynamic changes is to look for natural groupings in the post-test data, and then relate these grouping to the pre-test data. The post-test results on the MALS were selected for cluster analysis, because all participants at this time had been working with a number of tests and most of them had also participated in a program for teaching vocabulary. Two-step Cluster Analysis procedure is an exploratory tool designed to reveal natural groupings (or clusters) within a dataset that would otherwise not be apparent. This procedure has been used to explore whether the MALS post-test dataset is composed of a single group or whether there are two or more natural groupings of children in the data.

An analysis of the post-test MALS data reveals two natural clusters. The cluster quality chart indicates that the overall model quality is "Fair". Cluster 1 consists of 77 children with a high MALS score and Cluster 2 consists of 38 children with a lower MALS score. Figure 1 shows the MALS post-test profile patterns for the two clusters. Inspection of the "variables of importance chart" indicates that the two most important variables contributing to the clustering results are item 12 ("I am not very good at solving problems"), item 16 ("I find a lot of school work difficult") and item 20 ("learning is difficult").

Insert Figure 1 here

Insert Figure 2 here

Development of academic self-perception for high- and low scoring children (Hypothesis 1)

Figure 2 shows the mean scores on the BPVS, Raven and S40 for the two clusters. T-tests for groups indicates that pupils in cluster 2 have significantly lower scores on these instruments ($p<.001$). Figure 2 also shows the mean pre-test and post-test MALS sum scores for the two clusters. It can be seen that children with high post-test MALS scores (cluster 1) have improved their self-concept compared to the first administration of the MALS ($t=5.30$, $df=76$, $p<.001$). For children in cluster 2, a significant decline in their self-concept ($t=-2.10$, $df=37$, $p<.05$) can be seen. Data in Figure 2 indicate that low performing children run the risk of lowering their academic self-concept over time, while high performing children tend to increase their academic self-perception.

An ANCOVA analysis of variance has been used to find the variables that best distinguish between the two clusters at the time of the post-test. In this analysis the MALS post-test data has been entered as the dependent variable. The fixed variables are the two clusters (N=70 and N=35) and participation in the vocabulary training program (N=76 and N=29). The

covariates are the MALS pre-test data, the Raven, the BPVS, and S40. We found a significant effect of clusters on the MALS post-test data (1,105)=94.67, p<.001), but no significant effect of participation in the teaching program on the MALS post-test data (F(1,105)=.72, NS). Furthermore, there are no significant interaction effects between clusters and participation and cluster. Of the four co-variates there is a significant effect of the MALS pre-test scores on the MALS post-test scores (F(1,105)=35.66, p<.001) and a significant effect of the Raven on the MALS post-test scores (F(1,105)=8.20, p<.001), but no significant effect of the S40 (F(1,105)=1.12, NS) and BPVS (F(1,105)=.23, NS).

In sum, pupils with low MALS pre-test scores and low Raven scores run the risk of decreasing academic self-concept over time. This finding supports the view that changes in academic self-perception and problem solving ability is related. This indicates a Matthew effect (Stanovich, 1986) often seen in studies of learning.

Discussion

At the first administration of the MALS the score for the full sample was 72.1 and at the second administration the score was 74.5 (see Table 1). These values are quite similar to the values reported in a test retest study carried out by Burden (2012). He found that the mean score at the first occasion was 69.5 and 70.25 at the second. In Burden's study the MALS was administered at two occasions with a few days interval. The correlation between the scores at each occasion was found to be .96. This correlation is substantially higher than the correlation between the MALS scores on the two occasions in our study (r=.64). One explanation of this difference between the correlations might be that the sample studied by Burden was considerably smaller (N=22 and N=19) than the current sample. Another explanation might be differences in time between the two occasions of testing in the studies: a few days in Burden's study and about 8 months in the present study. In the English standardization sample (N=389) Cronbach's alpha was .85. This level is quite similar to the alphas found in the present study. The statistical values regarding the Norwegian translation supports that MALS can be considered to be an internal consistent instrument to be used in Norwegian schools

A main idea behind the construction of the MALS is that standardized tests of ability cannot predict with perfect accuracy how successful children will develop at school or in society (Burden 2012). Other factors such as academic self-concept will also contribute. To evaluate

the relation between academic self-concept and cognitive measures, Burden (2012) computed a number of correlations between MALS and cognitive measures. These correlations were found to be highly significant.

The MALS is clearly sensitive to changing self-perception over an extended period of time. The dynamics of these changes was studied by using cluster analysis of the post-test data. When the two clusters were related to background information, the two clusters could be referred to as groups of respectively low and high achievers. The dynamics of the changing self-concept in the course of time seems to be that high achievers evaluate themselves more positively, while low achievers evaluate themselves more negatively. The background variable that distinguished most clearly between high and low achievers was the Raven. Raven is a nonverbal test of problem solving, but it may also be regarded as a test of information processing (Raven et al., 1986). In this perspective, it becomes clear that pupils who experience information processing problems rate themselves more negatively in the course of time while higher processing capacity has a beneficial effect on academic self-concept after a period of time.

In most Western countries extended use of tests and time spent on preparing the children for the tests, has been practiced. This positive point of departure with ambitions of strengthening the learning culture in schools might end up with a boomerang effect with declining results. This might happen if the ambitions regarding the school system in a country create a culture regarding effects and control, which disregards the importance of a supportive teaching culture in the schools favoring children coming from low achieving families. Our results could be regarded a warning to society regarding the quality of school culture. If the culture promotes competition and segregation of children in school, we ought to be aware of consequences for the children who might not succeed in meeting these high ambitions in the daily work in the classroom. The general consequences of this might easily be an increased negative Matthew effect (Stanovich, 1986). Ambitions are positive and might create good test results for some children, however, if the consequences of the test culture is teach-to-test practice and superficial learning, these results might come with a serious cost.
So, the important here and now message might be to make use of tools like MALS in order better to understand the psychological state of learning among the children. Burns' wording (1982:126) that '*children whose self-concepts do not include the view that they can achieve academically, tend to fulfil that prediction'* is a 'writing on the wall', which everybody who

is responsible for school development has to be aware of, to prevent the negative consequences of an exaggerated achievement-oriented school culture.

Accordingly, we consider the MALS to be a useful instrument for teachers to gain insight into pupils' self-concept to be able to intercept negative developmental signals from pupils with a low academic self-concept in order to ensure mastery for each child on important learning areas.

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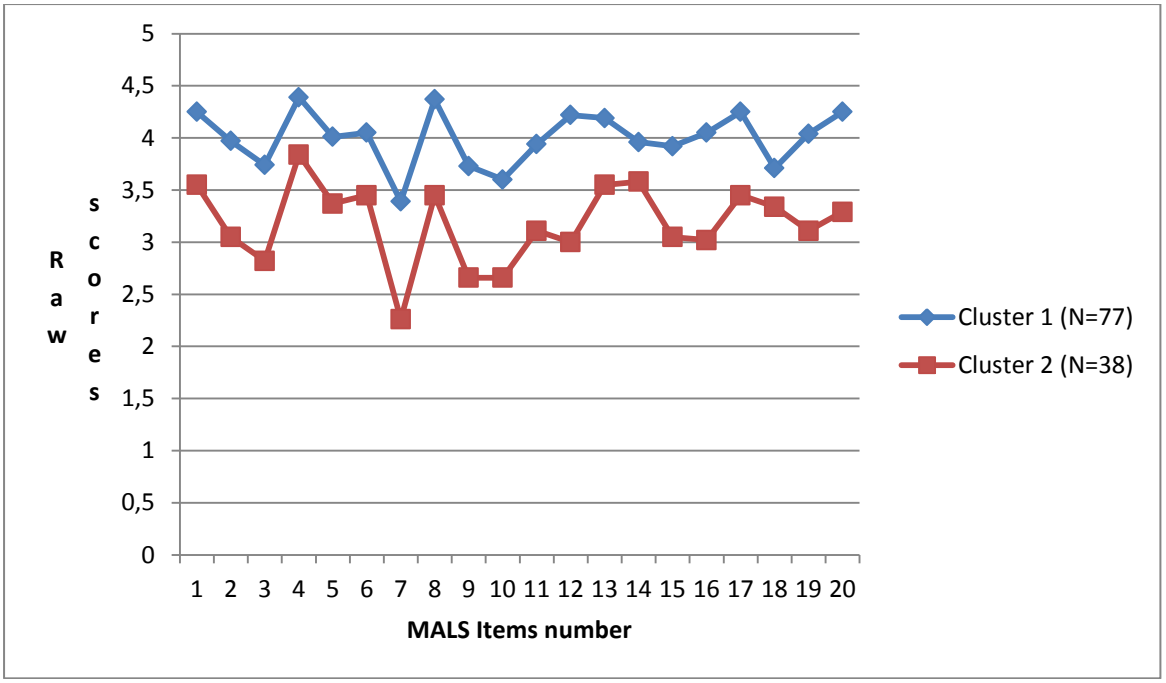

Figure 1: MALS post-test profile patterns for each of two clusters (level of positive self-concept)

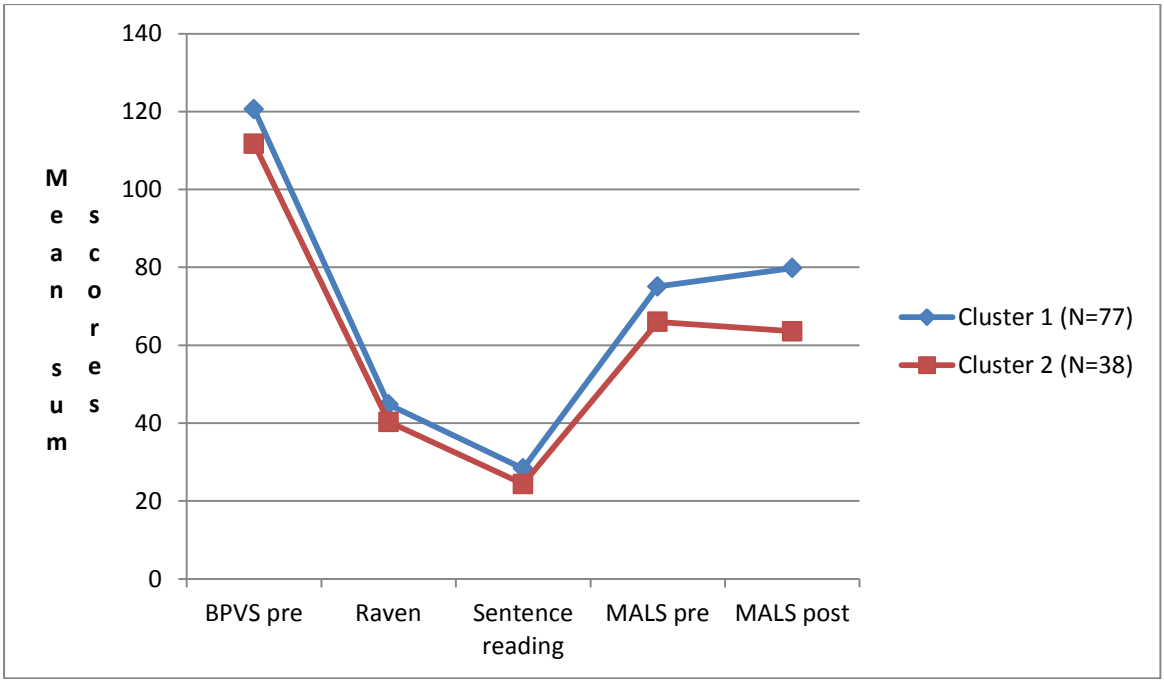

Figure 2: The mean scores on the BPVS, Raven, S40 and MALS for the two clusters**.**

Table 1: Means, raw scores, number of cases, and standard deviations for the experimental and control group on the instruments used in the study.

		MALS pre	MALS post	Problem Solving (Raven)	Receptive language (BPVS)	Reading comprehension (S40)	Age at the time of pre-test
Experiment	Mean	72.04	73.89	43.10	117.25	26.67	148.

	N	84	84	83	83	78	84
	Sd	9.15	9.73	7.66	10.72	5.686	14.52
Control	Mean	72.38	76.03	43.77	118.93	27.97	143
	N	31	31	31	30	30	31
	Sd	11.42	9.65	5.73	11.623	6.206	17.94
Total	Mean	72.13	74.46	43.28	117.69	27.03	147
	N	115	115	114	113	108	115
	Sd	9.77	9.71	7.17	10.942	5.835	15.59

Table 2: Pearson correlations between the MALS and other instruments used in the study.

Instruments		MALS pre	MALS post
BPVS pre	r	.38**	.35**
	p	.000	.000
	N	113	113
BPVS post	r	.27**	.28**
	p	.004	.003

	N	113	113
Raven pre	r	.42**	.32**
	p	.000	.000
	N	114	114
Sentence reading pre	r	.24**	.23*
	p	.010	.016
	N	108	108

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

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