DEVELOPING NEW SCALES FOR ASSESSING ENGLISH AND GERMAN LANGUAGE MASTERY MOTIVATION

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INTRODUCTION

This paper is dedicated to Marianne Nikolov on the occasion of her birthday. Some years ago we had a joint project focused on language achievements in English and German (Józsa & Nikolov 2005; Nikolov & Józsa, 2006). I really enjoyed that collaboration with Marianne and learned a lot.

In her study published ten years ago, she wrote that studies on foreign language learning motivation had a renaissance (Nikolov, 2003). This statement still holds true today. Moreover, we can even say that research on motivation has become more intense in the past decades. In her study mentioned above, Nikolov compared foreign language learning motivation of learners of English and German. This paper attempts to carry out a similar analysis, focusing on language learning motivation in English and German.

The aim of my research was to explore mastery motivation among Hungarian learners of English and German. A new scale was developed to assess language mastery motivation. The first piloting of the questionnaire took place in September 2013. Participants of the cross-sectional study were students from grades 4, 6, 8, and 10; a total of 775 school children. The present paper summarizes the main findings of this study.

LANGUAGE PREFERENCES IN HUNGARY

After the political change, from the beginning of the 1990s, foreign language preferences in the Hungarian educational system have gradually transformed: in schools the Russian language was replaced by German and English. During the first half of the 2000s approximately 50 percent of the secondary school students learned English, and almost 40 percent learned German. The ratio of those learning a foreign language other than these two did not even reach 10 percent. In the 1990s both English and German were very popular among students; however, now the dominance of English has become evident (Nikolov & Józsa, 2006; Nikolov & Vígh, 2012). English is the language of IT, tourism and business, which significantly contributed to the fact that it gained prominence over German. Also, the possibility to study or work abroad can be a further language learning related motivational factor among students.

LANGUAGE LEARNING MOTIVATION

One of the pioneers of research on language learning motivation is Robert Gardner, whose name marks the so-called socio-psychologic era that remained influential in terms of language learning motivation from the end of the 1950s until the 1990s. Before Gardner the general belief was that the most crucial factors of language learning are intelligence and proper verbal skills; attitudes and motivation were not regarded as important (Gardner, 2001). In Gardner's theory, however, the phenomenon of integrative motivation, learning motivation is closely related to positive attitudes towards the native speakers of the target language, to contacts with them. The concept of instrumental motivation, on the other hand, refers to the individual's desire to master a foreign language, for instance, to get a higher salary or a promotion (Dörnyei et al., 2006).

Research in the past decades has even gone further: motivation is described in a dynamic model, in which an important role is attributed to the teacher, the parents and the group, in other words, to the broader context of learning (Nikolov, 2003).

One of the recent studies pointed out that self-choice activities in English (e.g., watching movies, listening to music, surfing the internet) are closely connected with language motivation (Józsa & Imre, 2013). Classroom processes also play a crucial role in the development of language motivation. However, these were not the focus of research until the middle of the 1990s (Nikolov, 1995). Some research aims at the investigation of the role of intrinsic motivation in language learning (Nikolov, 2003). Intrinsic motivation refers to the desire to participate in an activity, merely for the pleasure derived from the activity itself and can have a significant effect on proficiency (Nikolov, 2007).

MASTERY MOTIVATION

The concept of mastery motivation is clearly related to the concept of intrinsic motivation, but research in the two fields has developed separately, in part because studies of intrinsic motivation have focused on older children and teens, while mastery motivation research has, until recently, focused on infants and preschool children. Although mastery motivation has usually been assumed to be initially intrinsic in young infants, the definition and focus of mastery motivation research have been on a child's persistent attempts at mastering challenging tasks, whether the reward comes from within or extrinsic rewards are offered (Józsa & Morgan, in press; McCall, 1995).

Mastery motivation forces us to train and master a certain skill or ability. Under adequate conditions, mastery motivation operates as long as the challenge persists and as long as acquisition is not complete; i.e., until mastery has been reached. Mastery motivation is understood as a "psychological force that stimulates an individual to attempt independently, in a focused and persistent manner, to solve a problem or master a skill or a task which is at least moderately challenging for him or her" (Morgan et al. 1990, p. 319). Mastery motivation is conceptualized by Barrett and Morgan as a complex psychic structure consisting of two main dimensions: 1) an instrumental component and 2) an expressive or affective component. Further domains of the instrumental component are behavioral manifestations of persistence, which was understood as the principle measure of mastery motivation in previous studies. These manifestations include a) cognitive persistence, b) social persistence and c) gross motor persistence. Experiencing mastery pleasure provides the necessary feedback and reinforcement in relation to mastery motives (Barrett & Morgan, 1995).

Mastery motivation functions as the basis of learning in infants, but such motivation can also be active and can be activated in preschool and school-aged children, as well as in adults. This fact is well exemplified by children who find great pleasure in learning to count and read, or adults who pursue their profession with expertise. However, the school and the family both play an important role in the development and functioning of mastery motivation in these skills (Józsa, 2007). Mastery motivation has a fundamental impact on cognitive, social, and psychomotoric development (Wang & Barrett, 2013). Some studies indicate that mastery motivation may be a better predictor of cognitive development than intelligence, hence playing a crucial role in school achievement (Józsa & Molnár, 2013; Yarrow et al., 1975). Shonkoff and Philips (2000) maintain that mastery motivation is a key factor in personality development. They highlight the importance of research in this field, stating that assessment of mastery motivation should be an important part of the evaluation of childhood development.

DOMAIN-SPECIFIC APPROACH TO MASTERY MOTIVATION

Research on school motivation has highlighted that motivation to learn may strongly depend on context. A student could be motivated in the field of mathematics, but this might not apply to language learning. Research on self-concept has revealed that students' self-concepts are differentiated according to subject domains; e.g., self-concept in mathematics is different from self-concept in reading (Marsh, 1990; Zanobini & Usai, 2002). Similar results have been produced in the field of academic intrinsic motivation (Gottfried et al. 2001; Steinmayr & Spinath, 2009).

Hence, it can be assumed that mastery motivation and cognitive persistence can vary across school contexts, skills, and subjects. However, no instruments are yet available to investigate the school subject-specific aspects of mastery motivation (Józsa & Molnár, 2013).

AIM OF THIS STUDY

The study was part of a larger project concerned with the development of new scales to measure domain-specific dimensions of mastery motivation. Likert-items were developed for the following domains: reading, mathematics, science, English and German as foreign languages, music and art.

This paper aims at an analysis of English and German language mastery motivation. Psychometric indices were calculated for these scales, and age-related changes in foreign language mastery motivation were analyzed between grades 4 and 10. The relationships of mastery motivation and school achievement were also explored, as well as the effects of parents' level of education. The study also sought to determine if there are gender differences in foreign language mastery motivation.

METHODS

Instrument

New scales to assess domain-specific dimensions of mastery motivation were established. For each domain (scale) 9-12 Likert items were formulated. Items were developed on the basis of the definition of mastery motivation (Barrett & Morgan, 1995; Busch-Rossnagel & Morgan, 2013), the DMQ (Dimensions of Mastery Questionnaire) scales by Morgan (1997) and his colleagues as well as their Hungarian adaptation (Józsa, 2007). Those items were regarded as models for our items. It was my intention that the items of the seven scales of the new instrument should be as similar to each other as possible. The two scales analyzed in this study can be regarded as completely equivalent, the only difference between the two be-

ing the name of the foreign language. Both the English and the German language mastery motivation scales were comprised of 10 Likert-type items.

The domain-specific mastery motivation scales were reviewed by fellow-researchers and in-service teachers. The piloting of the instrument was administered to 60 participants at the beginning of September 2013. The results of the pilot study indicated a need to delete one item per scale.

Data were collected within the framework of a school lesson during the last week of September 2013. The questionnaire was supplemented with questions on school achievement (school grades) and demographic data. Students were given 45 minutes to fill in the online questionnaire for which the EDIA software developed by *Center for Research on Learning and Instruction at University of Szeged* was used. During the data collection procedure, students were able to read the Likert items on the screen and simultaneously listen to them using headphones. At the beginning of the data collection procedure, students watched a short video explaining how to fill in the online questionnaire. Data on parents' level of education was collected on a six-point scale (1 = did not finish primary school, 2 = primary school, 3 = vocational school, 4 = secondary grammar school, 5 = BA degree, 6 = MA degree). The data indicated that the parents of English learners proved to have a higher level of education (mother M = 4.85, father M = 4.67) than those of the German learners (mother M = 3.51, father M = 3.73); the difference is significant (mother t = 7.09, $p < .001$; father t = 4.86, $p < .001$). This finding is similar to an earlier one which also found that the parents of English learners have higher levels of education (Józsa & Nikolov, 2005).

Sample

A total of 775 students participated in the study from grades 4, 6, 8, and 10. 47% of the participants were boys. When comparing the different grade levels, no significant differences were found in mother's and father's highest levels of education.

Each student filled in the questionnaire in the foreign language they have been studying for the longest time. 75% of the students fell into the learners of English as a foreign language subsample, while 23% of them were in the German as a foreign language subsample. No significant differences were found between the grade levels concerning the ratio of learners of English and German. Only 2% of the students claimed that they were not learning either English or German; they were excluded from further analyses.

RESULTS

Reliability and basic statistics of the scales

The Cronbach's alpha index of the English mastery motivation scale was high, 0.90, for the total sample. Similarly high alpha indices were found in the subsamples of the different grade levels: 0.89 – 0.90. The corrected item-total correlations were also high, 0.41 – 0.79, their median being 0.69. Both the item-total correlations and the alpha if item deleted indices are indicative of a good fit for each Likert-item (Table 1).

Table 1. Likert items in English language mastery motivation (EMM) scale

#	Item	Corrected item-total correlation	Cronbach's alpha if item deleted
E1	If I do not understand an English sentence, I read it again.	.646	.891
E2	If I cannot spell something in English, I practice until I learn it well.	.677	.889
E3	I do my best to be good at English.	.790	.882
E4	I practice English to get better at it.	.741	.884
E5	I practice English words until I know them well.	.756	.884
E6	I want to master English.	.694	.889
E7	I do my best to be a better and better speaker of English.	.740	.885
E8	I am pleased when I can think in English.	.411	.903
E9R	I do not care if I have poor English.	.524	.900
E10R	If I do not understand something in English, I give up.	.598	.895

Note: *R* refers to negative items.

The reliability of the German language mastery motivation scale is also high, 0.84; in the subsamples of the different grades the indices are all above 0.8. This degree of reliability is somewhat lower than that of the English language mastery motivation scale, but still suggests a high reliability of the scale. The corrected item-total

correlations are acceptable, ranging between 0.27 and 0.74, their median being 0.61 (Table 2).

Both scales included two reversed items. Comprehension of reversed items turned out to be more demanding for respondents. These items often lower the degree of reliability of Likert-scales (Józsa & Morgan, 2012). This negative effect was not observed for these two scales. In this study the reversed items of the English language mastery motivation scales show an appropriate fit. However, it must be noted that the omission of these items would not result in a lower degree of reliability. Items E8 and G8 assess mastery pleasure. Mastery pleasure comprises a distinct scale of the DMQ (Morgan, 1997). Accordingly, these items show a looser fit for the language mastery motivation scales.

Table 2. Likert items in German language mastery motivation (GMM) scale

#	Item	Corrected item-total correlation	Cronbach's alpha if item deleted
G1	If I do not understand a German sentence, I read it again.	.607	.820
G2	If I cannot spell something in German, I practice until I learn it well.	.661	.813
G3	I do my best to be good at German.	.708	.812
G4	I practice German to get better at it.	.741	.803
G5	I practice German words until I know them well.	.595	.820
G6	I want to master German.	.619	.823
G7	I do my best to be a better and better speaker of German.	.686	.814
G8	I am pleased when I can think in German.	.272	.845
G9R	I do not care if I have poor German.	.275	.862
G10R	If I do not understand something in German, I give up.	.462	.839

Note: *R* refers to negative items.

Item means are presented in Table 3, most of them being above 4. Considering that the means were derived from responses on a five-point scale, these values are considered high. Nonetheless, the items displayed an acceptable discriminatory strength with standard deviations ranging between 0.6 and 1.0.

The means of most English language items show a significant decline between grades 4 and 10 (Table 3). However, no such decline was observed for items E6 („I want to master English.") and E8 ("I am pleased when I can think in English."). The means of these items were very high, above 4.5, on each grade level. Similarly, no age-related difference was found in the E9 reversed item.

The means for the German language items exhibited a more significant decline with age. In this case half of the item means of grade 10 students were below 4. One exception to this tendency is item G8 ("I am pleased when I can think in German."), the mean of which does not change with age, but remains high on all grade levels.

After scale means were calculated for each participant, linear transformations were conducted on the means, using the formula (x-1)*25. This way, the scale would range between 0 and 100, called percentage points (%p). Correspondences between the 1-5 values of the scale and the percentage points are as follows: 1 = 0%p, 2 = 25%p, 3 = 50%p, 4 = 75%p, 5 = 100%p.

Table 3. Means of the Likert items

Item	English				German			
	4	6	8	10	4	6	8	10
1	4.59	4.27	4.46	4.44	4.67	4.40	4.13	4.20
2	4.49	3.87	4.08	3.94	4.67	4.56	4.18	3.30
3	4.63	4.23	4.28	4.23	4.80	4.60	4.16	3.73
4	4.55	3.94	4.11	4.14	4.72	4.40	3.84	3.20
5	4.59	4.15	4.31	4.25	4.78	4.73	4.08	3.77
6	4.76	4.58	4.60	4.80	4.88	4.81	4.49	4.38
7	4.65	4.28	4.22	4.30	4.85	4.62	4.08	3.63
8	4.76	4.67	4.81	4.72	4.92	4.92	4.87	4.77
9R	4.39	4.36	4.35	4.48	4.33	3.08	4.08	4.10
10R	4.52	4.26	4.25	4.23	4.21	3.62	3.58	3.70

Note: *R* refers to negative items.

Age-related changes in language mastery motivation are shown by Figure 1. While English language mastery motivation significantly declined between grade 4 and 6, no significant differences were observed in EMM between grades 6, 8 and 10 (Grade comparison 4 > 6, 8, 10; ANOVA F = 4.49, p = .004). German language

mastery motivation, on the other hand, showed a steady decline between grades 4 and 10 (Grade comparison 4 > 6 > 8 > 10; ANOVA F = 11.32, p < .001).

When looking at the whole sample for all ages combined, no significant difference was found between English (M = 85, SD = 18) and German (M = 83, SD = 17) language mastery motivation (t = 1.07, p = .286). When comparisons were made by grade level, no significant difference was found between grade 4, 6 and 8. However, in grade 10 learners of English (M = 84) reported significantly higher mastery motivation (t = 3.51, p = .001) than their German learner peers (M = 72).

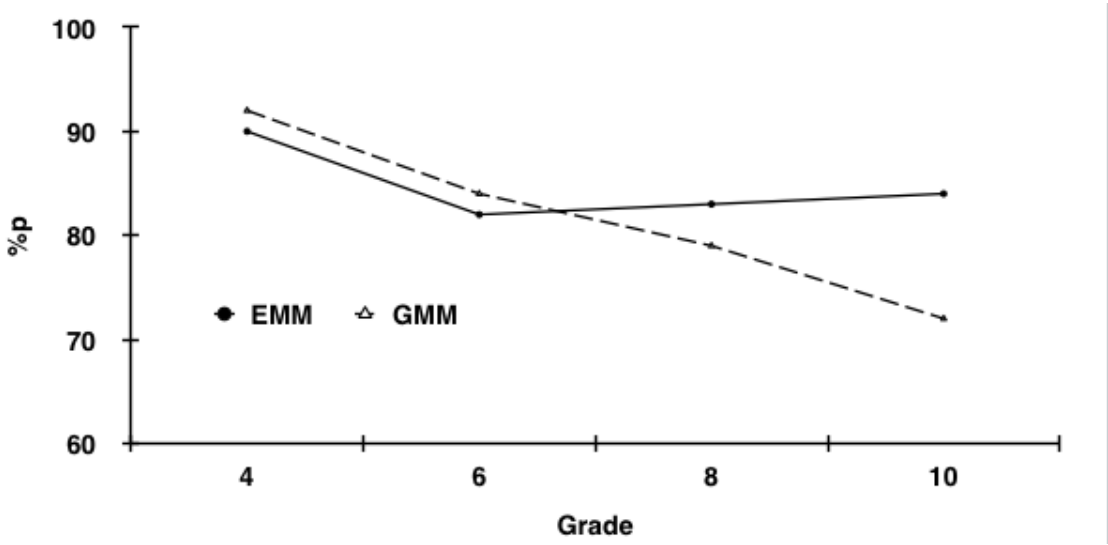

Figure 1. Age changes in English (EMM) and German (GMM) language mastery motivation

Two background variables: Gender and parents' education

The English language mastery motivation of girls (M = 88, SD = 15) is higher than that of boys (M = 81, SD = 21). Although the difference is significant (t = 4.02, p < .001), the effect size is small (eta^2 = .03). In contrast to English, no significant gender differences were found in German language mastery motivation (t = .012, p = .991).

In the demographic part of the questionnaire, students were asked about their parents' highest education level. About one third of the students supplied no information about this question, who were then excluded from this analysis. A composite index was created for parents' education level by calculating the means of the two variables. Parents' education was correlated with English and German mastery motivation at each grade level (Table 4). Out of the eight correlations, five indicated a significant relationship between the parents' level of education and language

mastery motivation. For English, the median of correlations is .25, for German it is .20. These results suggest that parents' education is weakly related to language mastery motivation.

Table 4. Correlations between language mastery motivation and parents' education

Language	Grade			
	4	6	8	10
EMM	.36**	.04	.30**	.19*
GMM	.03	.45*	.02	.37*

Note: EMM = English language mastery motivation; GMM = German language mastery motivation.

Relationships between language mastery motivation and school achievement

We explored relationships between language mastery motivation and school grades on the different grade levels. Correlation analyses were carried out between English language mastery motivation and English grades, as well as between German language mastery motivation and German grades. These resulted in a total of eight correlation coefficients (Table 5). Every correlation coefficient was found significant ($p < 0.01$). The median of the four correlation coefficients of EMM and English grades is 0.49, while that of GMM and German grades is 0.51. Thus the relationship between language mastery motivation and grades received in the given foreign language are of equal strength for both English and German. It can be concluded that mastery motivation is related to L2 achievement at school both for English and German. According to Vaske, Gliner and Morgan (2002), the effect sizes of these correlations are larger than typical.

Table 5. Correlations between language mastery motivation and school grades in English and German

Language	School grades in English or German			
	4	6	8	10
EMM	.54	.35	.54	.44
GMM	.75	.51	.51	.37

Note: EMM = English language mastery motivation; GMM = German language mastery motivation. All correlations are significant at $p < 0.01$.

DISCUSSION AND CONCLUSION

In this study I started out from the assumption that there are skill-specific and school subject-specific dimensions of mastery motivation. From among these, the present study focused on language learning. It introduced a new Likert-type instrument to measure English and German language mastery motivation and presented the results of the first data collection procedure with this instrument among grade 4–10 students.

For the assessment of English and German language mastery motivation two Likert-scales were developed, consisting of ten items each. The scales proved to be of high internal consistency reliability, the Cronbach's alpha being .90 for the English and .84 for the German scale. These values are somewhat higher than those of the scales of DMQ. The scales of English and German mastery motivation are specific versions related to the *cognitive persistence* scale of DMQ. The reliability of the DMQ cognitive persistence scale is .74 for Hungarian (Józsa, 2007), .78 for American and .75 for Chinese students (Morgan et al., 2013). The reliability of the scales of language mastery motivation might be higher, because items in these scales have more items and have a narrower scope; therefore, their internal consistency could be higher than that of the DMQ cognitive persistence scale. It can be assumed that high reliabilities confirm that school-subject-specific aspects of mastery motivation can be measured.

Previous studies have pointed out that dimensions of mastery motivation decline with age. This decline is evident in the case of Hungarian, American and Chinese students alike (Józsa & Molnár, 2013; Wang et al., 2012). In line with the results of these studies, German language mastery motivation also decreases with age. However, English mastery motivation drops significantly only between grades 4 and 6, but no further decline was found in later ages in the overall scale score. Most of the English items do show a decline, but several of them, including the negatively worded items and mastery pleasure item, do not. No difference was observed between English and German mastery motivation among grade 4, 6 and 8 students. In grade 10, however, English mastery motivation was significantly higher than German mastery motivation.

No significant gender differences were found in language mastery motivation. Mastery motivation for both English and German shows a weak correlation with the parents' level of education ($r \sim 0.2$). These results are consistent with previous findings on gender differences and the role of parental background in mastery motivation (Józsa, 2007; Józsa & Molnár, 2013; Józsa & Morgan, in press).

There is a moderate correlation between English and German in terms of language mastery motivation and school grades ($r \sim 0.5$). This result suggests that mastery motivation plays an important role in foreign language learning at school. This, incidentally, is in accordance with previous research which found that DMQ cognitive persistence was moderately related to school grades (Józsa & Molnár, 2013).

To my knowledge this paper was the first to explore school-related, subject-specific mastery motivation. The results indicate that the newly developed scales are appropriate measures to be used in further studies as well. It also seems to be necessary to conduct further research on schoolchildren's subject-specific mastery motivation. It can be assumed that subject-specific mastery motivation may be more closely related to successful acquisition in the given domain, subject or skill, than mastery motivation in general.

Further research is necessary to explore the relationship between language mastery motivation and other subject-specific mastery motivation dimensions (reading, maths, etc.). Similarly, it is yet to be answered how subject-specific mastery motivation is related to other dimensions of mastery motivation measured by the DMQ. Finally, the most important question may be the one that concerns the role of these different dimensions of mastery motivation in successful school-based learning.

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