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EDUCATIONAL PSYCHOLOGY & COUNSELLING | RESEARCH ARTICLE

Comparative study of Russian- and Romanian-speaking students' mastery motivation in the Republic of Moldova

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Abstract: Recent empirical research has demonstrated the importance of mastery motivation in child development. Therefore, it is essential to have valid and reliable instruments to measure this variable. The Dimensions of Mastery Questionnaires (DMQ 18) was validated in English, Hungarian, Chinese and Spanish. In this article, we evaluate the psychometric properties of Romanian and Russian versions of DMQ 18 that were piloted simultaneously. The study sample consisted of 315 fifth-grade students studying in Russian language schools or Romanian language schools. Reliability of these two versions was demonstrated by good internal consistency. Factor analysis that fits well the theoretical dimensions provided evidence of construct validity. Moreover, this publication presents a comparative ethnic study of

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PUBLIC INTEREST STATEMENT

The study investigates the psychometric properties of the Romanian and Russian versions of the Dimensions of Mastery Questionnaire in 5th grade students and explores the level of mastery motivation between the students that study in schools with Romanian and Russian language of instruction. This is the first validity study of the DMQ18 in two languages simultaneously in the Republic of Moldova. The use of measurement invariance allowed a cross-ethnic comparison of mastery motivation between students enrolled in schools with different languages of instruction and using the same curriculum. Both versions of DMQ18 showed satisfactory psychometric properties, and the comparison of the means of the DMQ18 scales of the Romanian and Russian groups of students proved that only the Romanian-speaking students rated themselves significantly higher on one scale. Our results make DMQ18 a valid tool for use in all the schools of the Republic of Moldova, regardless of the language used in instruction.

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Russian- and Romanian-speaking school-aged students from the Republic of Moldova and highlights ethnic differences in mastery motivation as perceived by students.

Subjects: Educational Research; Middle School Education; Educational Psychology

Keywords: Motivation; mastery motivation; dimensions of mastery questionnaire; measurement invariance; cross-ethnic study; measurement invariance

1. Introduction

Mastery motivation is a multifaceted, intrinsic, psychological drive that generates in a child the need to try to master a skill or solve a problem that is at least moderately challenging for them. If one is unmotivated to master challenging tasks, then one is unlikely to continue to work on them until one has mastered them; thus, mastery motivation would seem to be a prerequisite of competence development. Mastery motivation is multidimensional, in terms of the contexts in which it is displayed (e.g., home and school), in terms of the domains of development it encompasses (Busch-Rossnagel & Morgan, 2013; Wang & Barrett, 2013), and in terms of two overarching aspects of mastery motivation (Barrett & Morgan, 1995).

The two overarching aspects of mastery motivation are the instrumental and affective/expressive aspects (Józsa & Barrett, 2018). Instrumental aspects are goal-oriented, focusing an individual on pursuing, controlling, and attempting to solve a problem or master a skill, task, or outcome. They include goal-directed persistence and inclination to control and/or have an impact on the environment. Affective/expressive aspects are the emotions produced while the individual is trying to solve a challenging problem or master a skill or task or immediately after mastering or failing to master it, which contribute to ongoing and future motivation. Affective aspects include mild-to-moderate positive and negative emotions that typically stimulate continued mastery attempts, such as pleasure, interest, and enthusiasm in trying to master challenging tasks, as well as mild frustration at perceived impediments to that mastery. In addition, affective mastery motivation includes emotions that may undermine mastery motivation, promoting withdrawal and giving up, such as sadness and shame at less successful mastery (Barrett & Morgan, 2018).

Although most people have some degree of mastery motivation, there are individual differences in level of mastery motivation. Individual differences in the instrumental aspect of mastery motivation involve how motivated a person is to persist physically or cognitively in solving a task of a moderate level of difficulty or mastery of a skill or ability. Regarding the expressive aspect, the primary indicator that has been used is task pleasure, but sometimes other emotions associated with efforts to master, such as anger, sadness, frustration, shame, are also measured. Finally, Barrett and Morgan (2018) identify three domains of instrumental aspect: (1) object mastery motivation, (2) social mastery motivation, and (3) gross motor mastery motivation.

Empirical studies of mastery motivation demonstrated that early development and display of mastery motivation predict cognitive and social competence development and achievement in school; hence, mastery motivation is treated as one of the predictors of school achievement and social life success (Józsa & Molnár, 2013; Józsa & Morgan, 2014). Therefore, mastery motivation is a crucial factor to assess and incorporate into children's preschool evaluation (Shonkoff & Phillips, 2000).

While mastery motivation theory shares the concept of mastery with other approaches to learning motivation such as achievement goal orientations, it conceptualizes mastery from a different perspective. The achievement goal theory theorizes that individuals adapt either a mastery goal or performance goal orientation to learning (Elliot & Murayama, 2008). The pursuit of mastery is regarded as being a core concept in both mastery motivation and achievement goal

theories, but in mastery motivation theory a person persists despite challenges/difficulties, whereas, in the achievement goal orientation approach, mastery-goal oriented children strive despite failure (Józsa & Barrett, 2018). Thus, mastery motivation theory focuses on mastering various challenging tasks and skills in any or all multiple mastery domains, rather than an overall orientation to keep striving despite failure.

Mastery motivation has been assessed in various cultural contexts, which enables research to investigate cultural and social contextual differences in mastery motivation and other variables that are correlated with mastery motivation. However, it is important to ascertain whether the questions in a questionnaire have comparable meaning and psychometric properties after they are translated into different languages. The present study provides data regarding this for the Russian and Romanian translations of the Adult-report DMQ.

2. Ethnic differences

There have been several studies of similarity and differences in mastery motivation between cultures (Józsa et al., 2020). However, to date, cross-cultural psychological studies on mastery motivation have operationalized culture as "country", despite acknowledging cultural differences within countries (Keller, 2012). Moreover, since the majority of studies compared Asian and Western countries, any observed cultural differences were further overgeneralized to stem from differences in individualism/collectivism of Asian versus Western countries and/or the specific structure of the educational system of each country. However, it was not possible to directly test hypotheses regarding the origins of any differences between countries. One exception to this was a study that examined cultural differences related to mastery motivation of preschool children in Taiwan (Taipei) and People's Republic of China (Hangzhou) who share the same traditional Chinese culture (Morgan et al., 2013). The differences that were identified at that time were hypothesized to stem from PRC's one-child policy, which might motivate parents to have higher expectations from their children. This explanation pointed to the possibility that cultural differences in mastery motivation are conditioned by country-specific political and educational systems, even when the cultural tradition of those countries is similar. However, to date, there is very little research on the impact of ethnicity within a country on mastery motivation, and to our knowledge none in countries beyond the U.S., where it is not possible to assume homogeneity in school systems. Therefore, it is not clear whether observed differences are due to ethnic differences or differences in schools that serve children from different ethnic communities.

3. Context of the Republic of Moldova

The educational system of the Republic of Moldova is regulated by the Education Code of the Republic of Moldova and by the National Curriculum, with the latter being obligatory for all pre-university educational institutions. Children are enrolled in primary education (ISCED 1) at the age of seven, but in some cases, they can enter at the age of 6. This level lasts four years and is followed by five years of lower secondary/gymnasium education (ISCED 2). These two levels are compulsory for all children. Later, the students can choose between various types of ISCED 3 schools (lyceum education and—secondary technical and vocational education) and ISCED 5 institutions (post-secondary non-tertiary technical and vocational education and training).

The Republic of Moldova is an ethnically and linguistically diverse country where education is provided in Romanian and Russian languages. A total of 76.31% of the schools (ISCED 1,2) are schools that provide instruction in the Romanian language, 17.54% are Russian language schools, 5.74% are mixed schools where education is offered both in Romanian and Russian, and 0.4% of schools are immersion schools. Thus, 76.17% of the Moldovan students study in a single language, Romanian, and 16.66% study in a single language, Russian. The students from these two types of schools are the target population for the present study.

There is little systematic research on the differences between these two types of educational institutions at any level in the Republic of Moldova, most studies being carried out

based just on the native language of the researcher. But due to the fact that this country was part of the former USSR, it has some geopolitical and socioeconomic similarities with other countries from the former Soviet Union (Connolly, 2014), allowing us to predict some commonalities in terms of discipline. Even after the disappearance of the USSR, obedience is valued as a socializing goal by Russian-speaking parents and educators in comparison with other cultures in the same country (Saar & Niglas, 2001; Tulviste et al., 2012). Considering this finding, there is a need to analyze potential differences between Russian-speaking and Romanian-speaking schools, to determine if any social, cultural and educational differences have an impact on the motivation of the individuals representing different cultures in this multicultural country.

4. Research AIMS

The main research aim of the present study focuses on the adaptation and testing of the Dimensions of Mastery Questionnaire (DMQ 18) into Russian and Romanian and analysis of the psychometric properties of these versions of student self-rated (Morgan et al., 2020). Moreover, the study aims at determining the differences in the perceptions of mastery motivation between fifth-grade Russian-speaking students and Romanian-speaking students in the Moldovan context.

5. Method

5.1. Participants
The research included 275 fifth-grade students receiving instruction either in Russian (162) or Romanian (113). The inclusion criterion that was used was that the students were enrolled in the relevant grade, i.e., fifth grade. The students were selected from schools that belonged to the same school district in the Republic of Moldova and were academically comparable based on the exam results that are made public every year.

5.2. Materials
The instrument used in the study is Dimensions of Mastery Questionnaire (DMQ 18) in Romanian and Russian languages. DMQ 18 consists of 7 scales and 41 five-level Likert items, each rated from not at all typical (1) to very typical (5). The instrumental aspect of mastery motivation contains four scales: Cognitive/Object Persistence (COP) (six items), Gross Motor Persistence (GMP) (five items), Social Persistence with Adults (SPA) (six items), and Social Persistence with Children (SPC) (six items). The expressive aspect of mastery motivation includes two scales: Mastery Pleasure (MP) (five items) and Negative Reactions to Challenge (NRC) (eight items). Finally, the General Competence scale (COM) (five items) measures the perceived ability to master a skill and is a measure of a potential influence on mastery motivation, rather than mastery motivation itself. The Negative Reactions to Challenge (NRC) scale is divided into two subscales: the frustration/anger subscale containing four items and the sadness/shame subscale consisting of a similar number of items.

The DMQ 18 includes 41 items with 5-point Likert scales ranging from 1 "not at all like me"- (child self-report) to 5 "exactly like me". Example items for the self-report version include (scale in parenthesis):

I work on a new problem until I can do it (Cognitive Persistence)
I am pleased with myself when I finish something challenging (Mastery Pleasure)
I try to do well at athletic games (Gross Motor Persistence)
I am sad or ashamed when I do not accomplish a goal (Negative Responses to Challenge)
I try hard to make other kids feel better if they seem sad (Social Persistence with Children)
I try hard to interest adults in my activities (Social Persistence with Adults)

5.3. Procedure

To ensure the comparability of the Russian and Romanian translations of the questionnaire, we adopted the back-translation approach to the adaptation and translation of DMQ-18 (for students and adults; Fajrianthi et al., 2020). A translator who has a strong command of all three languages (English-Russian-Romanian) and of psychology produced the translations from English into Russian and Romanian. The choice of a trilingual translator for the initial translation from English to both languages facilitated the creation of comparable versions across languages.

For the back-translation stage, we selected different translators for each language, Romanian and Russian, to provide the back translation of the instruments from Russian or Romanian into English. Next, back translations of the instruments were submitted to an expert in DMQ who evaluated DMQ18 back translations concerning content validity. At this stage, the expert estimated the degree to which the items within each variable measure what they were designed to. We received the feedback in an online session where each item was discussed in terms of its content validity and equivalence. As a result, more changes were administered in the Russian version based on the expert's feedback.

We also received ethics approval from institutional review board of the university and permission to collect data from the relevant educational institutions. Parents/guardians were informed on the objectives of the study, and they had the opportunity a signed non-consent form. Data were collected by the researchers, who informed the students on the purpose of the research and data collection procedures. The data were collected using paper-and-pencil administration mode.

5.4. Data analysis

Given prior theoretical and empirical research on DMQ 18 that specified an expected factor stracture, we used the confirmatory approach to statistical analysis. Thus, first, a well-fitted baseline model of DMQ 18 was estimated for Romanian-speaking and Russian-speaking groups separately testing both correlated and second-order factor models that were used in previous studies on DMQ 18 (Amukune et al., 2021; Hwang et al., 2017). The purpose of this first stage was to determine whether or not the entire set of Moldovan data fit the predicted model (Hittner et al., 2018). NRC items are usually not included in DMQ 18 factor analyses when there are limited sample sizes, given that their relatively lower internal consistency besides COM items are usually not included because they do not measure mastery motivation (Józsa & Morgan, 2015).

Moreover, the factor loadings of all the items were assessed. The minimum CFA factor loading considered for the study was .500 (K. C. Barrett et al., 2020). The factor loadings were used in defining the baseline model for both groups and residual variance in the model covariance matrices. The goodness of fit was evaluated by assessing the CFI, TLI and RMSEA fit indexes. The cutoff values for an adequate fit are as follows: CFI and TLI >0.900, RMSEA and SRMR <0.08 (Hair et al., 2018). Composite reliability (CR) was used to assess the internal consistency separately for data from the Romanian-speaking sample and the Russian-speaking sample. CR is based on the factor loadings in CFA (Trizano-Hermosilla & Alvarado, 2016). Convergent validity was considered satisfactory if the CR values for all the variables in the scale were higher than .700 and the average variance extracted (AVE) was higher than .500. AVE values lower than .500 were considered acceptable when the convergent validity values were above .600 (Fornell & Larcker, 1981).

Having merged the data of the Romanian-speaking and Russian-speaking participants and established the baseline model, the configural invariance for both groups was simultaneously established (Yu & Shek, 2014). Finally, measurement equivalency across students' language of instruction was conducted via multigroup CFA which provided further indication of construct validity revealing whether the measurement model structure was equivalent between groups with different characteristics (Putnick & Bornstein, 2016). Metric invariance was conducted to determine whether the constructs used in the DMQ18 were perceived the same in both groups, while scalar invariance was used to establish whether the latent means can be compared across

cultures (Hair et al., 2018). Partial invariance was considered for determining scalar invariance which is a prerequisite for comparisons between groups. A factor can be considered partially invariant if more than half of its items are invariant (Vandenberg & Lance, 2000). Invariance is demonstrated when comparisons of the models produce a ΔCFI < 0.01 and ΔRMSEA < 0.015 (Chen, 2007).

The next step was to compare the latent means of the Romanian-speaking group with the Russian-speaking group as the measurement invariance allows for analysis of group differences. The partial scalar invariance model was used as the baseline to compare the latent means between groups. The critical ratio (CR) was used to estimate the latent mean differences. A CR value >1.96 indicates statistically significant difference in the latent means (Byrne, 2013). A positive CR value corresponds to a higher latent mean compared to the reference group. The data were analysed employing IBM SPSS Statistics 23.0 Amos 28.0.

6. Findings

6.1. Baseline testing model
Given that the factor structure of DMQ18 was empirically studied previously, CFA models were employed in assessing the factor structure for Romanian and Russian data. Two correlated factor models were used, and one second-order factor model was tested on that.

First, the correlated five-factor model, which contained 28 items, was tested on the Romanian-speaking group since it contained a smaller sample. The first results proved a poor model fit: χ^2 (113) = 478.232, p < .001, df = 337, CFI = .900, TLI = .888, RMSEA = .061, 90% CI [.048, .073], SRMR = .0704. A model modification was necessary. As the sample size was small, we did not examine the multivariate outliers. However, we examined the standardized factor loadings and residual variance in the model covariance matrices (Molt & Conroy, 2000). Item 30 from the MP scale was dropped as it performed the poorest among all the items with a factor loading of 0.515 and it exceeded the criterion of ±2.000 of residual variance and it was associated with two items; therefore, it was dropped. The fit indices of the final baseline model were as follows: χ^2 (113) = 428.014, p < .001, df = 311, CFI = .914, TLI = .903 RMSEA = .058, 90% CI [.044, .071], SRMR = .0658 which indicated an acceptable fit. All factor and item loadings for this correlated five-factor model were significant (0.48–0.96, p < 0.01) with CR ranging from .861 to .931and AVE .496–.731 (Table A1). Next, based on the first-order five-factor model (27 items), the second-order factor model was tested. The results of fit indexes for this model did not fit the data as shown in Table 1.

Next, the same procedure was used for the data of the Russian-speaking students. Thus, the correlated five-factor model (that did not include item 30) was fit to the Russian-speaking data. The fit indices for the Russian group were as follows: χ2 (162) = 475.816, p < .001, df = 311, CFI = .924, TLI = .914, RMSEA = .057, 90% CI [.047, .067], SRMR = .0662, thereby indicating a good fit. We also examined the correlated five-factor model (that included item 30) on the Russian-speaking sample which produced the following fit indices: χ2 (162) = 500.431, p < .001, df = 337, CFI = .927, TLI = .918, RMSEA = .055, 90% CI [.045, .065], SRMR = .0651. The last second-order factor model provided acceptable fit indexes: χ2 (162) = 477.767, p < .001, df = 316, CFI = .925, TLI = .917, RMSEA = .056, 90% CI [.046, .066], SRMR = .0667. All the factor loading for the correlated five-factor model (27 items) ranged from .574 to .924, p < 0.01 with composite reliability of scale varying from .868 to .932. and AVE from .523 to .735 (Table A1).

Since for the Romanian data only model 2 correlated five-factor model 27 items had acceptable fit index values, this model was chosen to be the baseline model for the Romanian and Russian data. The model fit of the total sample was of the baseline model had also an acceptable fit χ2 (311) = 509.253, p < .001, df = 311, CFI = .942, TLI = .934, RMSEA = .048, 90% CI [.041, .056], SRMR = .0529.

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Table 1. Goodness-of-fit statistics for the CFA models of DMQ18							
	χ2	*df*	*p*	CFI	TLI	RMSEA	SRMR
Romanian-speaking data							
Model 1: correlated five-factor model, 28 items	478.232	337	<.001	.900	. 888	.061	.070
Model 2: correlated five-factor model, 27 items	428.014	311	<.001	.914	.903	.058	.065
Model 3: second-order factor model, 27 items	440.121	316	<.001	.909	.899	.059	.072
Russian-speaking data							
Model 1: correlated five-factor model, 28 items	500.431	337	<.001	.927	.918	.055	.065
Model 2: correlated five-factor model, 27 items	475.816	311	<.001	.924	.914	.057	.066
Model 3: second-order factor model, 27 items	477.767	316	<.001	.925	.917	.056	.066

6.2. Measurement invariance analyses

Measurement invariance was conducted within the framework of multigroup CFA. This analysis entailed testing the goodness of fit of a series of increasingly restrictive CFA models and its purpose was to test factorial invariance across groups which will allow to compare the groups (Romanian and Russian) on the mastery motivation constructs.

As presented in Table 2, the configural invariance model among language groups yielded an acceptable fit to the data, $χ2$ (275) = 903.985, p < .001, df = 622, CFI = .920, RMSEA = .041, 90% CI [.035, .046], SRMR = .065. The next, more restrictive model which tested metric invariance also produced an acceptable model fit, $χ2$ (275) = 930.513, p < .001, df = 644, CFI = .919, RMSEA = .040, 90% CI [.035, .046], SRMR = .069.

Finally, the scalar model was tested, but the results proved a statistical change in the fit of the model. Thus, we proceeded to test the partial scalar invariance model (Vandenberg & Lance, 2000). The intercepts of item 3 of GMP scale, item 1 from COP, items 22 and 33 of SPA and items 25 and 28 of SPC were allowed to vary across the language groups. The model-fit results of the partial scalar invariance were $χ2$ (275) = 984.128, p < .001, df = 665, CFI = .919, RMSEA = .042, 90% CI [.036, .047], SRMR = .070. The change criteria ΔCFI and ΔRMSEA values met the recommended ones.

6.3. Cross-ethnic comparisons

In the quest for an improved understanding of cross-ethnic variations of mastery motivation in the Republic of Moldova, we conducted analyses to determine the differences in perception of the students of their mastery motivation using the DMQ18. Using the tested partial scalar invariance model across Romanian-speaking and Russian-speaking groups, the latent means across these two groups were compared. As shown in Table 3, there are no significant differences between the

Table 2. Goodness-of-fit statistics of measurement invariance for the correlated five-factor first-order model of the DMQ18					
	χ2	*df*	CFI	RMSEA	ΔCFI	ΔRMSEA
Configural invariance	903.985	622	.920	.041		
Metric invariance	930.513	644	.919	.040	.001	.001
Partial scalar invariance	984.128	665	.910	.042	.009	−.002

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Table 3. Latent means and differences in DMQ18 scales among two groups				
DMQ18 scales	**Means (SD)**		**CR**	***d***
	Russian-speaking group	**Romanian-speaking group**		
1. COP	3.557 (.838)	3.904 (.750)	−3.500	.803
2. GMP	3.800 (1.148)	4.033 (.895)	−1.388*	1.052
3. SPA	3.822 (.948)	3.792 (.814)	0.269	.89584
4. SPC	3.896 (.892)	3.792 (.813)	−1.248	.84027
5. MP	4.461(.745)	4.544 (.595)	−1.196	.68767

Note: CR = critical ratio, *d* = Cohen *d*.

*p < .001.

latent means of COP, SPA, SPC and MP scales. But their latent mean comparison demonstrated that the Russian-speaking group 3.800 (1.148) had statistically significant lower GMP then the Romanian-speaking group 4.033 (.895) (CR = −1.388; *p* < .001; Cohen's *d* = 1.052), indicating the greater tendency of Romanian-speaking children to persist on challenging physical activities, in comparison to Russian-speaking children.

7. Discussion

The DMQ18 has been used to assess dimensions of mastery motivation among school children and was used in various empirical studies, including cross-cultural studies aimed at researching education and human development (Hwang et al., 2017; Józsa et al., 2020). We conducted this study with the aim of adapting the DMQ to the Russian and Romanian languages, analyzing the psychometric properties of the Russian and Romanian versions of the DMQ-18 for school-aged students, and determining whether there were any differences between the two language groups at the level of reported mastery motivation domains. The instrument contains 41 items and seven subscales that measure six aspects of mastery motivation, as well as perceived competence.

In the current study, we tested as the baseline model the five-factor first-order and five-factor second-order factor model using CFA for the Romanian-speaking group and for the Russian-speaking group. This first stage of the study is a prerequisite for establishing the whole data baseline model that must fit separately the group data sets. In our study, we started with the Romanian-speaking data set as it was the smallest and the small sample size could have caused model fit issues. The result of the CFA analysis concluded that the model fit of the Romanian-speaking data set was acceptable with the deletion of item 30 from MP scale. The factor loading of this item was acceptable, above .500 but the residual variance was above the cutoff value of ±2 and was associated with two items. The five-factor first-order models test (with and without item 30) yielded an acceptable model fit for the Russian-speaking data. However, since the criterion for the baseline model establishment is to obtain acceptable model fit values for both groups, we selected model 2. The behaviour of item 30 in the Romanian-speaking data set cannot be explained by its correlation coefficient between the observed variable and the latent common factor as it met the cutoff value, but at the same time, it had a large amount of variance that remained unexplained by the other items. We believe that the main cause of this behaviour was the sample size of the Romanian-speaking data set, as in the Russian-speaking data set, its behaviour was acceptable both on the factor loading and residual variance analyses. Moreover, in the previous DMQ18 CFA analyses, all the items of the MP scales fit the five-factor model (Amukune et al., 2021; Morgan et al., 2017; Shaoli et al., 2019).

Measurement invariance is a compulsory condition for comparison of latent means in cross-cultural studies. This analysis is not common within mastery motivation research. It was used in

few recent studies on a preschool sample (Hwang et al., 2017) and school-aged children (Wang et al., 2020) in across-country analysis. This is the first study in which measurement invariance is used to establish appropriateness of questionnaires using different languages to measure mastery motivation within a single country. Thus, consistent with our hypothesis, the configural and metric invariance of the data set was achieved. This provided evidence that the first-order factor structure of the DMQ18 supported the inference that items and scales had equivalent meaning to participants across the Romanian- and Russian-speaking groups (configural invariance), and the items used to measure the underlying factors of the DMQ18 were equivalently associated with the latent variables for both ethnic groups (metric invariance). Partial scalar invariance was achieved which allowed a meaningful comparison of the latent means. The partial scalar invariance was achieved by relaxing six out of 27 intercepts. On the SPA and SPC scale, two intercepts were relaxed and COP and GMP only one which met the most strict recommendations for partial invariance (Steinmetz, 2011). Partial measurement invariance findings indicate that a meaningful comparison of latent means of DMQ18 is valid and that there are differences between the Romanian-speaking and the Russian-speaking 5th grade students in terms of mastery motivation scales.

Finally, an important contribution of the present study is the investigation of ethnic differences in mastery motivation in a country where the educational system provides complete instruction in two different languages to fit the needs of most of the population. Thus, addressing the last aim of the present research related to the differences between the perceptions of mastery motivation of Russian-speaking students and Romanian-speaking students in the Moldovan context, we determined that the 5th graders rate themselves similarly on the COP, SPC, SPA and MP scale. On the GMP scale, the Romanian-speaking students rated themselves significantly higher than the Russian-speaking students with a very large effect size.

When comparing the self-ratings of mastery motivation of the Russian and Romanian-speaking students only one difference was identified, on GMP, where the Romanian-speaking students rated themselves higher than the Russian-speaking students. These findings both support the comparability of the Russian and Romanian language versions of the DMQ18 and the similarity in perceived motivation across these ethnic groups in Moldova. This finding is in line with the results of cross-cultural comparisons of Hungarian-, Chinese-, and English-speaking school-aged children who determine a difference on the same scale on which the English and Hungarian-speaking students rated themselves statistically significantly higher than the Chinese-speaking students.

This study's limitation to fifth grade students suggests the need to include cross-ethnic studies of mastery motivation at various stages of school evaluation to determine the possible impact of ethnicity at different ages and levels of schooling. Such results could inform interventions to support student's mastery motivation and subsequently their academic achievement (Józsa & Barrett, 2018; Vansteenkiste et al., 2014). This is supported by the established evidence that mastery motivation is a predictor of school achievement (Hashmi et al., 2017; Józsa & Molnár, 2013). However, it is also important to determine to what extent the ethnicity of the student and language of the educational system explain variation in mastery motivation within one educational system (Józsa et al., 2020).

8. Limitations

The present study's findings contribute to the understanding of mastery motivation of Russian- and Romanian-speaking fifth grade students in the Republic of Moldova. However, the results of this study should be considered with caution because there are several limitations related to the sampling. Although the sampling procedures included such criteria as schools using a single language of instruction, location in urban areas, and similar school size, the results might not generalize to understanding mastery motivation in rural areas of the Republic of Moldova, as the rural and small schools were excluded from the study.

9. Conclusion

Results of the study of mastery motivation in the Republic of Moldova on subjects studying in school with Romanian language instruction and Russian language instruction contribute to the growing research on mastery motivation around the world, it establishes the research on motivation on secondary school students in this country, and it highlights the issue of the role of ethnicity related to mastery motivation in an educational system that provides schooling to different languages (Hwang et al., 2017; Józsa et al., 2014).

The empirical analysis of the Russian and Romanian versions of the DMQ18 sets the path to advance longitudinal and complex research on mastery motivation in the Republic of Moldova to assess whether the development of mastery motivation follows established patterns in other countries. Moreover, having both Russian and Romanian versions enables further study of whether a homogeneous educational system of a country can override the ethnic values of an ethnicity, leveling their mastery motivation levels. If so, one might predict that similarities would be greater at older ages relative to younger ages, when children have less exposure to the school environment. Much more research is needed regarding the role of the culture in child development and school achievement within the Moldovan educational system.

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Author contributions
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Appendix

Table A1. Factor loadings of the items from DMQ-18 of the Russian and Romanian version of student self-rated CR and AVE							
		Russian			**Romanian**		
No	**Factor**	**Factor Loading**	**CR**	**AVE**	**Factor Loading**	**CR**	**AVE**
	Cognitive-Oriented Persistence		.868	.523		.890	.574
17	I try to figure out all the steps needed to solve a problem	.779			.684		
40	I prefer to try challenging problems instead of easy ones	.582			.649		
1	I work on a new problem until I can do it	.588			.760		
14	I complete my schoolwork, even if it takes a long time	.696			.594		
23	I work for a long time trying to do something challenging	.647			.728		
29	I will work for a long time trying to solve a problem for school	.658			.715		
	Gross Motor Persistence		.932	.735		.931	.731
3	I try to do well at athletic games	.809			.837		
36	I try hard to get better at sports	.924			.849		
26	I repeat sports skills until I can do them well	.865			.838		
12	I try to do well in physical activities even when they are challenging	.833			.834		
38	I try hard to improve my ball-game skills	.656			.718		
	Social Persistence with Adults		.888	.569		.874	.539

(Continued)

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Table A1. (Continued)

No	Factor	Russian			Romanian		
		Factor Loading	CR	AVE	Factor Loading	CR	AVE
22	I try hard to get adults to understand me	.632			.647		
19	I try to get adults to see my point of view	.574			.715		
33	I try to find out what adults like and don't like	.780			.778		
15	I try hard to interest adults in my activities	.729			.676		
37	I try hard to understand the feelings of adults	.734			.656		
8	I often discuss things with adults	.640			.523		
	Social Persistence with Children		.891	.578		.855	.496
28	I try hard to make friends with other kids	.812			.619		
25	I try hard to understand other children	.710			.557		
6	I try hard to make other kids feel better if they seem sad	.663			.653		
7	I try to say and do things to keep other kids interested	.599			.644		
32	I try to get included when other kids are doing something	.774			.670		
35	I try to keep things going when I am playing with other kids	.692			.688		
	Mastery Pleasure		.871	.628		.861	.609
2	I get excited when I figure something out	.672			.658		
11	I get excited when I am successful	.808			.669		

(Continued)

No	Factor	Russian			Romanian		
		Factor Loading	**CR**	**AVE**	**Factor Loading**	**CR**	**AVE**
18	I am pleased when I solve a problem after working hard at it	.679			.638		
21	I smile when I succeed at something I tried hard to do	.670			.810		

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