



Introduction to the Special Issue on Mastery Motivation: Measures and Results across Cultures and Ages

Hungarian Educational Research Journal
2017, Vol. 7(2) 5–14
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<http://herj.lib.unideb.hu>
Debrecen University Press

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DOI:10.14413/HERJ/7/2/1

Abstract

The goal of this special issue of the Hungarian Educational Research Journal (HERJ) is to provide a broad up-to-date overview of the current state of research about the important concept of mastery motivation, which is shown by a person's persistent attempts to solve problems and master skills and by his or her pleasure when solving problems. This special issue provides new research on mastery motivation in Hungary, the US, Taiwan, Malaysia, Bangladesh, Iran, and Australia, with several articles comparing mastery motivation in two or more of these countries. The articles cover a broad age span from infants to young adults and describe several methods for assessing mastery motivation, including new and revised methods.

Keywords: motivation, child development, students, mastery motivation, mastery tasks, Dimensions of Mastery Questionnaire, cultural comparisons, school achievement

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Recommended citation format: Morgan, G. A., Józsa, K., & Liao, H.-F. (2017). Introduction to the special issue on mastery motivation: Measures and results across cultures and ages. *Hungarian Educational Research Journal*, 7(2), 5–14. doi:10.14413/HERJ/7/2/1

Introduction

The U.S. National Academy of Science report *From Neurons to Neighborhoods* (Shonkoff & Phillips, 2000) identified mastery motivation as a key developmental concept, which should be included as part of a child's evaluation. Thus, mastery motivation is an important topic for the *Hungarian Educational Research Journal* (HERJ) to include as a special issue. In part this is because there is evidence that early mastery motivation leads to later competence and achievement in school. That is, children became more competent because of their early persistence at tasks, even if early on they are not highly competent. Yarrow, Klein, Lomonaco, and Morgan (1975) reported that cognitive-motivational behaviors in infancy, such as reaching for and manipulating novel objects, predicted preschool children's Stanford-Binet intelligence quotient (IQ); whereas, the whole Bayley Mental Developmental Index did not. Similarly, Józsa and Molnár (2013) found that mastery motivation was more predictive of school grades than IQ and tests of basic skills. Recently, Józsa and Barrett (2016) found that mastery motivation in preschool children predicted school performance in grades 1 and 2. Wang (2016) found that persistence at mastery tasks predicted both cognitive and fine motor ability six months later in preschool age children with global developmental delays. Thus, measuring mastery motivation has implications for education and early intervention. Most of the papers for this special issue of HERJ discuss such implications.

Definition and Key Measures

Morgan, Harmon, and Maslin-Cole (1990) proposed that mastery motivation stimulates a child to attempt to master a skill or task that is at least moderately challenging for him or her. Mastery motivation has two major aspects: instrumental and expressive (Barrett & Morgan, 1995). The *instrumental aspect* motivates a person to attempt, in a focused and persistent manner, to solve a problem or master a skill or task. The *expressive aspect* of mastery motivation produces affective reactions while the person is working at such a task or just after completing it. This affect may or may not be overtly expressed and may assume different forms in different children as they develop. Busch-Rossnagel and Morgan (2013) described the strengths and weaknesses of the two main measurement techniques to assess mastery motivation, individualized challenging behavioral tasks and the Dimensions of Mastery Questionnaires (DMQ).

Studies with Behavioral Mastery Tasks

In early mastery motivation research, the general procedure was to begin the tasks with the tester demonstrating how to use a problem-posing toy. Then the toy, such as a puzzle, was given to the infant who had the opportunity to try to complete it with little encouragement and no help from the experimenter. The duration of task-directed behaviors, called persistence, was the primary measure of mastery motivation. In the Yarrow et al. studies (1982, 1983) all children of a certain age were given the same tasks or problems. These tasks were intended to be challenging for the average child, but due

to individual differences in children's abilities, the same task could be very hard for some children and easy for others. This problem led to the development of the individualized moderately challenging task method.

Morgan, Busch-Rossnagel, Maslin-Cole, and Harmon (1992) developed procedures that attempted to deal with the problem of controlling for cognitive differences between children and also made longitudinal analysis more meaningful. This strategy involved the use of sets of similar tasks/toys, such as puzzles, which had several levels of difficulty. The child's motivation was assessed with one level of each set of tasks that was found to be moderately difficult for that individual child. Specifically, a task was selected because the child had successfully completed at least part of it, but had not finished all parts of the task too quickly. Thus, the level chosen for a given child was moderately challenging but not so hard that partial completion was not achieved. The child's persistence and pleasure at those moderately difficult tasks were the main measures of mastery motivation. McCall (1995) called this individualized approach, with its identification and use of moderately difficult tasks "one of the most important measurement advances" (p. 288), in part because it facilitates the separation of ability or competence from motivation. This individualized method has been used by a number of researchers and led to an increasing understanding of mastery motivation in young children developing typically and, especially, atypically (e.g., Gilmore & Cuskelly, 2011; Young & Hauser-Cram, 2006; Wang, Morgan, Hwang, & Liao, 2013).

Hashmi, Seok, and Halik (2017, this issue) used these individualized mastery tasks as the outcome variables for their "I can" mastery motivation classroom program with young preschool children in Malaysia. In their paper, they describe and evaluate their intervention to enhance children's persistence and pleasure when trying to complete challenging tasks using a randomized pretest-posttest experimental design. They believe that the "I can" intervention program should lead to better school performance later.

Green and Morgan (2017, this issue) expanded the age range of the individualized tasks to be suitable for school-age children 7 to 10 years old. Using a person-oriented statistical approach, they identified four patterns of the children's behavior on the mastery tasks that produced distinct profiles of task behavior. Then they looked at how well mothers' and teachers' DMQ ratings and also teachers' ratings of intrinsic motivation predicted the child's task behavior profiles.

Wang, Morgan, Liao, Chen, Hwang, and Lu (2016) reported evidence for reliability and validity of an improved individualized task method. For example, these revised Individualized Moderately Challenging Tasks (IMoT) allowed for the possibility of identifying several moderately difficult tasks for a given child. Wang, Liao, and Morgan (2016) provided an example of how this revised individualized task procedure was used to assess one child with developmental delays.

Wang, Liao, and Morgan (2017, this issue) described this individualized challenging task method in detail for use with 15 to 48 month-old children, and they included information on reliability, validity, and descriptive statistics. Wang (2016) used these revised tasks to assess young preschool children who had global developmental delays and found that there were bidirectional relationships between mothers' interactive teaching behavior and the child's mastery motivation over a 6-month time period. More importantly, she found that mastery motivation mediated the relationship between mother's teaching behaviors and the child's later cognitive and also fine motor ability.

Barrett, Józsa, and Morgan (2017, this issue) described in detail a new computer-tablet procedure for assessing pre-academic knowledge, mastery motivation, and executive functions in 3 to 8 year-old American and Hungarian children as a school readiness predictor. The procedure described by Barrett et al. is designed to be an assessment that could become a complement to the nationally used Hungarian readiness test, DIFER, Diagnostic Assessment Systems for Development (Nagy, Józsa, Vidákovich, & Fazekasné Fenyvesi, 2016). Józsa, Barrett, Józsa, Kis, and Morgan (2017, this issue) focused on the results from testing Hungarian children with the mastery motivation tasks described by Barrett et al. (2017, this issue). They report an initial evaluation of the tablet tasks based on a computed measure of persistence on tasks that were actually moderately challenging for each individual child. Future plans for the assessment are that it become available for parents and teachers who would receive feedback about their child's "approaches to learning" and suggestions for enhancing them.

Studies with Mastery Questionnaires

The Dimensions of Mastery Questionnaire (DMQ) assesses mastery motivation by having a parent or teacher rate their perceptions of the child's mastery motivation (and/or school-aged children rate their own behavior) in mastery contexts. The DMQ is a key measure in three of the papers in this special issue, and is the basis of the related questionnaires in the last two articles (Józsa, Kis, & Huang, 2017, this issue; Gilmore, Islam, Younesian, Bús, & Józsa, 2017, this issue).

When development of this mastery motivation questionnaire began, there were no parental report questionnaires designed to assess the motivation of toddlers and preschool children. Temperament questionnaires did assess perceptions of persistence, but none of them provided adequate coverage of the *motivational* aspects of preschoolers' attempted problem solving and mastery. Over time the DMQ was expanded to include parent and teacher ratings of infants and also school-age children. The school-age versions also had a form for the child to rate him or herself. All the age versions of the DMQ have common items that were thought to be appropriate across ages. The remaining items varied somewhat by age version but paralleled the items in the preschool version.

More than 20,000 children from 6 months to 19 years of age were rated with DMQ 17, the penultimate version (Morgan, 1997; Morgan, Busch-Rossnagel, Barrett, & Wang, 2009). These included more than a thousand children with a variety of delays or at risk due to low social economic status (SES), prematurity, or other factors. Geographically and linguistically, these children were very diverse. Participants included English speakers from the United States, Canada, the UK, and Australia. Chinese speakers were from mainland China and Taiwan. In Hungary, more than 10,000 mostly typically developing school-age children rated themselves and/or were rated by their parents and teachers.

A number of journal articles, dissertations, and presentations have included the DMQ; some are noted in the reference list. Józsa (2007) published a book in Hungarian on his large sample studies of mastery motivation, cognitive skills, IQ, and school achievement. Overviews of DMQ 17 research on the Hungarian-, English-, and Chinese-speaking samples were published by Józsa and Molnár (2013), Morgan, Wang, Liao, and Xu (2013), Józsa and Morgan (2014), and Józsa, Wang, Barrett, and Morgan (2014). These papers summarized evidence for reliability and validity, relationships to other variables, and also compared the three cultures at similar ages and across ages.

Huang and Lay (2017, this issue) used the DMQ 17 to follow young children in Taiwan from 10 to 53 months, longitudinally. They examined the stability over time of the various DMQ scales, and they also used the DMQ and demographic variables to predict the child's later competence.

Hwang Wang, Józsa, Wang, Liao, & Morgan (2017, this issue) examined the measurement invariance of the DMQ 17 ratings of preschool children from Hungary, Taiwan, and the US in order to find out which items did and didn't work well in all three cultures. Confirmatory factor analyses for all cultures together were conducted, indicating a good fit for the expected five-factor model. Finally, multiple-group confirmatory factor analyses were conducted to examine the measurement invariance of the children's DMQ scores among the English-, Chinese-, and Hungarian-speaking samples combined. Measurement invariance was confirmed.

The Hwang et al. paper provided empirical evidence used to revise and strengthen the DMQ, which is now DMQ 18 (Józsa & Morgan, 2015, Morgan et al., 2015). In addition, to English, Hungarian, and Chinese versions of DMQ 18, there is now a Spanish version, and translations into other languages also are being used to assess children from at least Iran, Israel, Korea, and Turkey.

Morgan Liao, Nyitrai, Huang, Wang, Blasco, Ramakrishnan, & Józsa (2017, this issue) used this revised DMQ to describe and compare five samples of infants, toddlers, and preschool children with and without risks or delays from Hungary, Taiwan, and the US. The paper examined gender, age, parent education, prematurity, and developmental delay as variables that might affect DMQ ratings and cultural similarities and differences among these samples.

There are well documented declines (from elementary to middle to high school) in intrinsic motivation by self-rated American children (e.g., Gottfried, 1985; Harter, 1981). Józsa (2007), Józsa and Molnár (2013), Józsa and Morgan (2014), and Józsa, Wang, Barrett, and Morgan (2014) found similar age-related declines in several aspects of mastery motivation in Hungarian, American, and Chinese school-age children and teens. These declines were found in both cross-sectional and longitudinal studies, across cultures, and in the ratings of parents and teachers as well as children's self-ratings.

Józsa, Kis, and Huang (2017, this issue) used a questionnaire based on the DMQ (Józsa, 2014) to examine age and cultural differences in motivation for school subjects in Hungary and Taiwan. This Subject Specific Mastery Motivation scale (SSMM) has subscales to assess the school child's motivation to try hard and to express pleasure in school subjects such as reading, math, science, and English as a foreign language. Similar to the DMQ studies described in the preceding paragraph, in most school subjects, mastery motivation decreased from grade 4 to 8. However, in both Hungary and Taiwan, the mastery motivation for English as a foreign language did not decline from grade 6 to grade 10, leading to speculation about why middle and high school students remained motivated to learn English.

Doherty-Bigara and Gilmore (2015) used the DMQ as the basis for a new instrument, the Dimensions of Adult Mastery Motivation Questionnaire (DAMMQ), which they used to collect data from Australian adults aged 18-90 years. They found that the DAMMQ had acceptable psychometric properties and produced some interesting differences. Gilmore, Islam, Younesian, Bús, and Józsa (2017, this issue) used the DAMMQ to compare university students in Hungary to those in Australia, Bangladesh, and Iran. The paper examined the psychometric properties of the DAMMQ in the four cultures and compared cultural differences on the several DAMMQ scales.

Discussion

A questionnaire completed by parents, teachers, or the child/teen themselves can augment the usually short observational/behavioral task measures of mastery motivation because such raters have the opportunity to observe the child in other contexts and for longer periods and over time. The DMQ has proven to be useful for predicting school performance so several articles in this HERJ issue, which use mastery questionnaires, have important implications for educational institutions (e.g., Gilmore et al., 2017; Green & Morgan, 2017; Huang & Lay, 2017, and Józsa, Kis, & Huang, 2017).

On the other hand, behavioral measures are less filtered through the personality of the rater. Thus, we recommend, when feasible, that practitioners and investigators interested in mastery motivation use individualized moderately challenging mastery tasks and also the DMQ, as have several article in this issue: Green and Morgan (2017); Józsa, Barrett et al. (2017), and Wang et al. (2017). This combination of methods should prove even more helpful in providing implications for education.

There has been considerable recent interest among special educators and clinicians in assessing the concept of mastery motivation (e.g., Blasco & Guy, 2016; Gilmore & Cuskelly, 2011; Majnemer et al., 2013; Miller, Ziviani, & Boyd, 2014; Wang et al., 2013, 2016). Miller et al. (2014) conducted a systematic review of the properties of instruments designed to assess motivation in school-age children with a physical disability or motor delay; they concluded that the DMQ provides evidence of good clinical utility. Wang et al. (2016) has shown strong evidence for the reliability and validity of the revised individualized moderately challenging mastery tasks in children with global developmental delays. Also, Józsa, Barrett et al. (2017) provided evidence for the reliability and validity of the individualized moderately challenging measure derived from their computer tablet mastery tasks. Thus, research with the mastery assessments provides important implications for clinical practice and early intervention as indicated by several articles in this issue (e.g., Hashmi et al., 2017; Morgan et al., 2017; Wang et al., 2017).

In some DMQ research (e.g., Morgan, et al., 2013), parent ratings of English-speaking children with and without various delays have been compared. Children with delays were rated lower on the DMQ persistence scales and on competence than children developing typically who were similar in mental age. However, several research studies using both the DMQ and the individualized tasks have indicated that although parents (and no doubt teachers) tend to rate children with delays lower on mastery motivation, there were no differences in motivation on the individualized moderately challenging behavioral tasks (Gilmore & Cuskelly, 2011; Wang, Morgan, Hwang, & Liao, 2013). This later finding is probably because in these studies children with delays were given tasks that were appropriately difficult for them individually; i.e., were moderately challenging. Parents probably rate their children with delays lower because they compare them to children developing typically. These studies provide an important message and a caution for educators. There is good evidence for the validity of individual differences resulting from the mastery questionnaires. However, it should be remembered that the scores are based on raters' perceptions of mastery motivation. As such, the scores are influenced by the rater's frame of reference and culture. This caution is pointed out in several articles in this issue (e.g., Gilmore et al., 2017; Józsa, Kis, & Huang, 2017; Morgan et al., 2017). The positive message is that the motivation of children with delays seems, in general, to be as strong as that of children developing typically, if they are provided tasks that are moderately challenging for them personally.

Conclusion

Mastery motivation is a fundamental developmental construct that should be used as part of a comprehensive evaluation of children. The DMQ, SSMM, and DAMMQ questionnaires provide useful and easily obtained mastery motivation information for persons from infancy through adulthood, in home, school, and across cultures. The individualized moderately challenging mastery task procedures provide valuable behavioral measures for young children which can complement the ratings from

mastery questionnaires. The papers in this special issue of HERJ provide valuable new information about mastery motivation methods and results across cultures and ages. They also discuss some of the implications for educational practices and outcomes.

Acknowledgement

Morgan and Józsa received support for research on school readiness from a Colorado State University Ventures grants and Hungarian Scientific Research Fund, OTKA-K83850. Józsa also was supported by the János Bolyai Research Scholarship of the Hungarian Academy of Sciences. Liao is supported by the Ministry of Health and Welfare, Executive Yuan, Taiwan (M06F5054). Jessica Gerton, supported by the CSU Foundation Cooperative Research on School Readiness fund, provided word processing and technical editing for this and several other papers in this special issue. We also want to thank the reviewers of the 10 research papers in this HERJ special issue.

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