# A New Multi-Dimensional Domain-Specific Motivation Questionnaire: Measurement of Young Children's Multi-faceted Reading Motivation

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## Abstract

Students' motivation in reading at a young age may have significant influence on later learning outcomes. However, there is a dearth of instruments that measure elementary students' reading motivation, making it difficult for research advancement in the study of reading motivation. A multidimensional Reading Motivation Questionnaire (RMQ) was developed to investigate the reading goal orientations of students from Kindergarten to $6^{th}$ grade ($N = 275$ from an independent girls' school). Confirmatory factor analysis found five clearly distinguishable factors: Mastery, Intrinsic, Cooperative, Individual, and Competition. The youngest students (K-$2^{nd}$ grade) were less able to differentiate the factors than older students ($3^{rd}$-$6^{th}$ grade). The oldest students showed the greatest differentiation between the Individual and Cooperative factors. There was a decline found in four of the factors with age. The exception was the Individual factor, which was lowest for the youngest students. The instrument provides researchers and educators with a valid instrument to assess the motivational goals of elementary students, examine their development, and devise teaching and learning strategies based on theory and evidence.

Students' motivation is believed to have a significant influence on learning outcomes (Martin, 2003; Martin, Marsh & Debus, 2001, 2003; McInerney, 1995; McInerney, Roche, McInerney, & Marsh, 1997; Pintrich & DeGroot 1990; Schunk 1990; Yeung & McInerney, 2005). In elementary education, one of the most important academic outcomes is reading achievement. Children with reading problems are prevented from effective learning in a range of other areas (Rimm-Kaufman, Kagan, & Byers, 1999). Reading problems may even translate to later anti-social behaviour as failed learning experiences accumulate (Durrant, Cunningham, & Voelker, 1990). Although there is a general belief that it is crucial to motivate young children to read, motivation research to date has addressed students' school motivation in a general sense only, and there is a paucity of research that addresses a specific learning area such as reading. A central issue is the lack of a valid and reliable instrument to measure primary students' motivation in reading. The purpose of the present study is to develop a psychometrically sound multi-dimensional domain-specific measure of reading motivation for young children in Kindergarten to Year 6 and explore the development of multi-dimensional facets of reading motivation developmentally.

*The Importance of Motivation*

Motivation is generally believed to be crucial for effective learning. Researchers have claimed that better motivated students perform better in school grades and other achievement outcomes (e.g., Pintrich, 2003). Whereas traditional models of school motivation distinguished between intrinsic and extrinsic motivation (see Spaulding, 1992), more recent models of school motivation examine the goal orientations of students. Goal theory focuses on students' perceived goals and purposes for learning (Seifert, 2004), that is, their reasons for doing a task. Students' answers to the question, "Why am I doing the task?" may guide and direct their cognition and behaviour in their learning. Therefore, achievement goal orientations are presumed to be linked to achievement processes and outcomes (Pintrich & De Groot, 1990; Pintrich & Schrauben, 1992), and students' goals provide a framework for interpreting learning situations (Pintrich, Marx, & Boyle, 1993). In essence, students' reactions in the form of different patterns of learning processes are believed to result in different learning outcomes.

*The Measurement of Goal Orientations*

Achievement goal theories have typically focused on two answers to the question of why students engage in a learning task. Those students who engage in a task with the purpose of improving their level of competency and understanding are said to hold a mastery goal orientation. In contrast, students who engage in a task primarily to show superiority with reference to others are said to hold performance (or ego-related) goals. As such, performance goals focus on evaluations of relative ability (Ames, 1992), self-worth (Covington, 2004), and on gaining favourable judgments from others rather than on effort. Performance-oriented individuals can exhibit either approach or avoidance tendencies depending on their self-perceptions of competency (Elliot, 1999). Recent research has consistently found that mastery goals are associated with adaptive motivational behaviours including perseverance with difficult tasks (Nadler, 1998; Ryan & Pintrich, 1998), preference for challenging tasks (Sarrazin, Famose, & Curry, 1995; Seifert, 2004), and maintaining effort, interest and value in learning (Linnenbrink, 2005; Robins & Pal, 2002). Hence, research on achievement goal theory has consistently indicated that the extent to which students report pursuing mastery goals varies positively with their achievement outcomes. Whereas the salience and positive effect of mastery goals seems relatively universal (McInerney et al., 2003), the research evidence on the relation between performance goals and achievement is not as clear (Covington, 2004). Performance-approach goals have been linked to mastery-like

achievement patterns on some occasions (e.g., Elliot & Church, 1997), but less so on other occasions (e.g., Elliot, McGregor, & Gable, 1999).

Although motivational models developed from various theories have led to the proliferation of different constructs with a wide variety of names and labels, both traditional and more recent models of school motivation have essentially emphasized a distinction between constructs parallel to the intrinsic-extrinsic dichotomy. Because instruments with different names may measure the same underlying construct whereas those with the same name may measure completely different underlying constructs, Marsh (1994) has warned researchers to beware of jingle-jangle fallacies in motivation research. Marsh, Craven, Hinkley, and Debus (2003) emphasize that researchers should pursue construct validity vigorously to test interpretations of the measures so as to avoid "jingle (assuming that scales with the same name reflect the same construct) and jangle (assuming that scales with different names reflect different constructs) fallacies" (p. 192). Despite a greater emphasis on multiple dimensions in modern motivation models (e.g., McInerney, Marsh, & Yeung, 2003), more recently research has demonstrated that the various dimensions can be more or less subsumed under a limited range of constructs.

Marsh, Craven, Hinkley, and Debus (2003) reviewed a wide range of motivation literature relevant to the Big-Two-Factor Theory of motivation orientation. They identified seven major motivation constructs: Mastery, Intrinsic, Cooperation, Individual, Competition, Ego, Approach Success, and Avoid Failure. Marsh et al. (2003) then constructed a new measure known as the School Motivation Questionnaire (SMQ) for each of these seven scales with four to six items measuring each scale. Relevant to the present study on primary students' reading are five constructs, including: (a) Mastery—defined similar to learning goals as proposed by Dweck (1986; Ryan & Deci, 2000), and task and effort orientations as proposed by McInerney, Yeung, and McInerney (2001); (b) Intrinsic—defined in a similar way to the more traditional intrinsic motivation construct as proposed by Deci and Ryan (1985), (c) Cooperative—similar to the affiliation construct in McInerney et al. (2001) that emphasizes working with peers; (d) Individual—independent learning and working by oneself; and (e) Competition—defined as an other-referenced construct (McInerney et al., 2001) that emphasizes social comparison. Marsh et al. (2003) demonstrated that these scales had reasonably good psychometric properties. The constructs were clearly distinguishable from one another, even for the Mastery and Intrinsic scales that were assumed to be highly correlated with each other. Nevertheless, it is unclear whether these motivational constructs would be similarly applicable to a specific learning domain such as reading. It is the purpose of the present study to test the domain-specific psychometric properties of these constructs for young children in relation to reading motivation.

*Scales of the Reading Motivation Questionnaire (RMQ)*

On the basis of the Marsh, Craven, Hinkley, and Debus (2003) School Motivation Questionnaire (SMQ), a new instrument was designed to tap into the reading motivation of primary students. There are five scales in the new RMQ instrument:

(1) *Mastery* measures the degree to which a student is motivated in reading by mastery of knowledge or skills;

(2) *Intrinsic* measures the degree to which a student is motivated in reading by intrinsic self-referenced goals;

(3) *Cooperative* measures the degree to which the student is motivated in reading by affiliation and working with others;

(4) *Individual* measures the degree to which the student is motivated in reading by working on their own; and

(5) *Competition* measures the degree to which a student is motivated in reading by competitive other-referenced goals.

*Developmental Trends of Motivational Perceptions*

Studies of developmental trends of primary students' self perceptions have shown that older children tend to differentiate various constructs better than do younger children. For example, Marsh, Craven, and Debus (1999) found that older children are better able than younger children not only to make distinctions between their self-concepts in different academic areas, but are better able to differentiate between cognitive (perceptions of competence in an academic area) and affective (e.g, the extent to which students' enjoy a subject) domains.

In self-concept research, Marsh, Craven, and Debus (2000) have shown that children's self-concept of academic competence tends to decline with age. Marsh et al. interpreted their findings as suggesting that young children formulate unrealistic expectations and estimates of their capabilities and therefore exhibit a high self-concept score in comparison to older children who are more readily aware of their abilities and able to make social comparisons.. Achievement motivation research also demonstrates a general decline in academic motivation during the school years (Anderman, Maehr, & Midgley, 1999; Kurita & Zarbatany, 1991; Midgley & Edelin, 1998; Murphy & Alexander, 2000). In their review of literature from the 1980's, Midgley and Edelin (1998) suggest that many students experience "a deterioration in perceptions of self, affect, motivation, and performance during early adolescence and in particular, when they moved to middle-level schools" (p. 195). Yeung and McInerney (2005) have also provided evidence of declining motivation through the high school years. However, Kurita and Zarbatany (1991) agree that declines in motivation occur in early adolescence, but only until grade 9. Nevertheless, it is less clear whether such a decline would occur earlier than adolescence, and perhaps even in early elementary stages of schooling. In the area of reading motivation, there is no clear evidence of such a developmental trend. Researchers have suggested that declines in motivation are primarily due to the less facilitative classroom environment in the transition from primary to middle school (e.g., Feldlaufer, Midgley, & Eccles, 1988). However, when comparing older and younger students in the same primary school setting, if older students are found to be less motivated in reading than their younger counterparts such a claim would be dubious.

The present study aims to (a) test the psychometric properties of a newly developed multidimensional and domain-specific motivation instrument (that measures multiple facets of young children's reading motivation, and (b) examine the relations of multi-dimensional domain-specific reading motivation constructs developmentally. We hypothesise that the instrument will be a reliable and psychometrically sound measure of reading motivation. In addition, based on research findings from self-concept research, we hypothesise that older students will be better able to distinguish among five a priori reading motivation constructs than younger students as evidenced by lower inter-factor correlations for older children. Finally, based on achievement motivation research targeting general domains of motivation, we hypothesise that older students will display lower reading domain-specific motivation scores in comparison to younger students.

## Method

*Participants*

The sample was derived from an independent girls' school in Sydney, Australia. Participants were students in Kindergarten to Year 6 (age ranging from 5 to 12 years (Mean = 8.5 years), Kindergarten, $n = 20$; Year 1, $n = 39$; Year 2, $n = 43$; Year 3, $n = 43$; Year 4, $n = 50$; Year 5, $n = 34$; and Year 6, $n = 46$), whose parents consented to their child participating in the study ($N = 275$).

*Materials*

The Reading Motivation Questionnaire (RMQ) was developed on the basis of the Marsh et al. (2003) SMQ. Five scales were adapted from the Mastery, Intrinsic, Cooperative, Individual, and Competition scales of the SMQ to address the students' respective goal orientation related to reading. Hence the RMQ is a multidimensional domain-specific measure of reading motivation with five scales each comprised of four items:

*Mastery* -'I feel really clever at reading when I learn new things';

*Intrinsic* - 'I read because I like learning new things'; *Cooperative* 'I like to read with other children in a group';

*Individual* 'I learn the most when I read on my own'; and

*Competition* 'I learn the most when I try to read better than other children'.

*Procedure*

After obtaining ethics approval and consent from the school and parents, the students were asked to respond to the items on the survey. They responded to each item on a 5-point Likert-type scale (1 = strongly disagree to 5 = strongly agree). The responses to the items were coded such that higher scores reflected higher levels of motivation. For students from $3^{rd}$ to $6^{th}$ grades (3-6), the survey was orally administered by a trained research assistant to in intact classes with the assistance of the class teacher. For students from Kindergarten to $2^{nd}$ grade (K-2), the survey was individually administered by a team of researchers and trained research assistants.

*The individual administration procedure*. For the K-2 students, each item was read out by the administrator. For the first four items, the student was asked whether they understood the sentence. If they did not understand the sentence, the administrator explained this sentence in a different manner, checked the student understood the sentence, repeated the original sentence again, and asked the child to respond. The student was initially asked to respond to the sentence in a binary format of "yes" or "no", to indicate whether the sentence was a true or false description of themselves. In the case of a student responding "yes" initially to a sentence, they were then asked to respond "yes always" or "yes sometimes". In the case of a student responding "no" initially to a sentence, they were then asked to respond "no always" or "no sometimes". This same administration procedure was used for the 44 items of the instrument, with the administrator recording on the 5-point scale: *1 = no always, 2 = no sometimes, 4 = yes sometimes*, and *5 = yes always*. If students were unable to decide on a response for a sentence, the administrator checked that the student understood the sentence and provided them with a second opportunity to make a response. The middle category, *3 = student understands sentence but does not state yes or no*, was only used when students understood the sentence but could not decide whether to respond "yes" or "no". Students were not told that this middle category existed as an option and it was selected sparingly as administrators were instructed to ensure that students understood each sentence in the instrument.

*Statistical Analysis*

Preliminary analysis included reliability analysis and descriptive statistics. A series of Confirmatory Factor Analyses were conducted to examine whether the scales were psychometrically sound for the present sample. The analysis used 20 items such that the CFA was based on a 20 x 20 covariance matrix. The CFA was conducted with LISREL 8.72 (Jöreskog & Sörbom, 2005) using maximum likelihood estimation. In a CFA study, the parameters typically consist of factor loadings, factor variances and covariances, and measured variable uniquenesses (i.e., measurement errors associated with each item).

In assessing the CFA models, both absolute fit statistics and incremental fit statistics were utilized to evaluate the model fit (see Hoyle & Painter, 1995; Tanaka, 1993). The absolute fit statistics included the $\chi^2$ test of exact model fit and the root-mean-square error of

approximation (RMSEA; Browne & Cudeck, 1993). The incremental fit statistics (Hoyle & Painter, 1995) included the Comparative Fit Index (CFI; Bentler, 1990) and the Tucker-Lewis Index (TLI; Tucker & Lewis, 1973), also known as the non-normed fit index (NNFI; Bentler & Bonett, 1980). In general, the CFI and TLI vary along a 0-to-1 continuum in which values equal to or greater than .90 and .95 are typically taken to reflect acceptable and excellent fits to the data, respectively. According to Browne and Cudeck (1993), RMSEA values in the vicinity of .05 indicate "close fit," values near .08 indicate "fair fit," and values above .10 indicate "poor fit."

A series of CFA models were tested. First, we tested the ability of the four items of each a priori scale to fit the data in a one-factor congeneric model (Models 1 to 5). Then we tested a unidimensional model that incorporated all the 20 items in a single factor (Model 6). Next, as the focus of the present study, a multidimensional model (Model 7) was tested with five latent factors each inferred by four measured items. Finally, Model 8 was tested with the items for the Mastery and Intrinsic scales posited to infer a single factor. We hypothesized that Model 7 would provide the best fit and demonstrate acceptable psychometric properties in support of a multidimensional model of primary students' reading motivation.

To the extent that the validation of the multiple scales of the RMQ was supported, the second part of the analysis used the scale scores derived from averaging the item scores for each scale. Considering the limitation of the sample size, we examined the Pearson correlations among the scales separately for three groups of students: K-2, 3-4, and 5-6. Then a repeated-measures analysis of variance (ANOVA) was conducted for each group to examine whether the scores for the five scales were distinguishable for that group of students. Finally, a multivariate analysis of variance (MANOVA) was conducted to compare the mean scores of the five scales among these three groups to examine whether there would be any noteworthy developmental trend.

<div align="center">Results</div>

*Reliability and Descriptive Statistics*

Estimates of Cronbach alphas for the five a priori scales are presented in Table 1. The alpha estimates were acceptable and varied from .74 to .92 ($M = .81$) (see Table 1). This average reliability is higher than the target reliability of .70 (Nunnally, 1978; George & Mallery, 1995; Garson, 2005; Lewicki & Hill, 2006). These results provided a strong basis for subsequent CFAs.

Table 1
*Reliability Estimates, Means and Standard Deviations of the RMQ Scales*

| *Factors* | Alpha | Mean | *SD* |
|-----------|-------|------|------|
| Mastery | .75 | 4.46 | 0.63 |
| Intrinsic | .84 | 4.19 | 0.85 |
| Cooperative | .80 | 3.75 | 1.00 |
| Individual | .74 | 4.32 | 0.75 |
| Competition | .92 | 3.27 | 1.27 |

*Note*: $N = 275$.

The mean and standard deviation for each scale is presented in Table 1. For each scale, the mean value was above the scale midpoint (i.e., 3 on a 5-point scale), indicating the students' general endorsement of the scale items. The standard deviations were quite small except for Cooperative ($SD = 1.00$) and Competition ($SD = 1.27$). An examination of the means indicates that Mastery (4.46), Intrinsic (4.19), and Individual (4.32) scales displayed relatively higher scores compared to the Cooperative (3.75) and Competition (3.27) scales.

The lower scores for Cooperative and Competition (Means < 4) together with their higher variability ($SD > 1.00$) suggested that whereas there was an overall lower endorsement of these motivational goals, the students' perceptions varied.

*Confirmatory Factor Analysis (CFA)*

In the CFAs, each item was allowed to load on one and only one factor (all other factor loadings were constrained to be zero) and the uniqueness term associated with each item was not allowed to correlate with uniqueness terms for any other item. We started by testing the ability of the four items of each scales to form a single factor (one-factor congeneric Models 1 to 5). The goodness of fit of each model tested in the present study is presented in Table 2. Each one-factor congeneric model provided a reasonable fit to the data (NNFI and CFI > .90).

The unidimensional model (Model 6) tested the ability of the items to form a single motivation factor (Table 2). Model 7 was a multidimensional model testing the ability of five factors to explain the relations among 20 RMQ items. Although both models were fully proper, Model 6 (NNFI = .74, CFI = .77, RMSEA = .204) did not fit as well as the corresponding multidimensional Model 7 (NNFI = .96, CFI = .97, RMSEA = .062). Comparing Models 6 and 7, there was support for the multidimensional model positing five motivational factors (Model 7).

Table 2

*Summary of Models and Goodness of Fit Statistics*

| Model | $\chi^2$ | df | RMSEA | NNFI | CFI | Model Description |
|---|---|---|---|---|---|---|
| 1 | 3 | 2 | .033 | .99 | .99 | Mastery -4 items form 1 factor |
| 2 | 8 | 2 | .109 | .96 | .98 | Intrinsic - 4 items form 1 factor |
| 3 | 22 | 5 | .193 | .86 | .95 | Cooperative - 4 items form 1 factor |
| 4 | 1 | 2 | .000 | 1.00 | 1.00 | Individual - 4 items form 1 factor |
| 5 | 3 | 2 | .049 | .99 | .99 | Competition - 4 items form 1 factor |
| 6 | 2113 | 170 | .204 | .74 | .77 | Unidimensional model - 20 items form 1 factor |
| 7 | 327 | 160 | .062 | .96 | .97 | Multidimensional model - 5 RMQ factors |
| 8 | 412 | 164 | .074 | .95 | .95 | Multidimensional Model - 20 items form 4 factors |

*Note*: $N = 275$. RMSEA = Root mean square error of approximation. NNFI = Non-normed fit index. CFI = Comparative fit index. Models 1 and 5 are 1-factor congeneric models testing the ability of 4 items to form each a priori factor. Model 8 posited Mastery and Intrinsic as 1 factor.

The solution of Model 7 is presented in Table 3. All factor loadings were positive and significant, from .58 to .88 (median = .74). Most of the correlations among the five factors were positive, from low to medium ($r$s = .09 to .75), whereas the correlation between Individual and Cooperative latent factors was negative ($r = -.19$). Essentially, the factors were distinguishable from each other (Table 3). These results supported a multidimensional structure of the RMQ constructs.

To further test whether the students could distinguish between the Mastery and Intrinsic motivation constructs, Model 8 (Table 2) posited four factors, with eight items inferring a single Mastery-Intrinsic factor. This model had a good fit (NNFI = .95, CFI = .95, RMSEA = .074), but was not as good as the multidimensional Model 7 (NNFI = .96, CFI = .97, RMSEA = .062). Furthermore, in Model 7 (Table 3), the correlation between Mastery and Intrinsic was found to be low enough to be differentiated from each other ($r = .75$). There was therefore support for the separation of the Mastery and Intrinsic scales as two distinctive factors.

Table 3

*CFA Solution of Model 7*

|                        | Mastery | Intrinsic | Cooperative | Individual | Competition |
|------------------------|---------|-----------|-------------|------------|-------------|
| Variable **Factor Loadings** |   |           |             |            |             |
| Item 1                 | .71*    | .78*      | .78*        | .60*       | .82*        |
| Item 2                 | .61*    | .75*      | .74*        | .76*       | .86*        |
| Item 3                 | .72*    | .74*      | .61*        | .58*       | .86*        |
| Item 4                 | .62*    | .73*      | .71*        | .65*       | .88*        |
| **Uniquenesses**       |         |           |             |            |             |
| Item 1                 | .50*    | .39*      | .40*        | .64*       | .33*        |
| Item 2                 | .62*    | .44*      | .45*        | .43*       | .26*        |
| Item 3                 | .48*    | .45*      | .63*        | .66*       | .26*        |
| Item 4                 | .62*    | .47*      | .50*        | .57*       | .23*        |
| **Factor Correlation** |         |           |             |            |             |
| Mastery                | --      |           |             |            |             |
| Intrinsic              | .75*    | --        |             |            |             |
| Cooperative            | .44*    | .53*      | --          |            |             |
| Individual             | .35*    | .32*      | -.19*       | --         |             |
| Competition            | .46*    | .41*      | .57*        | .09        | --          |

*Note*: $N = 275$. Parameters estimates are completely standardized. $*p < .05$.

*Year Level Factor Correlations*

To examine whether older and younger students differed in their associations between the motivational constructs, Pearson correlations were examined for the three groups of the sample (K-2, 3-4, 5-6). This examination indicated that the mastery scale was significantly correlated ($rs > .3$) with Intrinsic, Individual, and Competition scales for all year levels. However, the correlation between Mastery and Cooperative was not statistically significant ($r = .11$) for the K-2 group. For the Intrinsic scale, the correlations with all other factors were significantly positive except for the 3-4 group, where the correlation between Intrinsic and Competition was not statistically significant ($r = .17$). For the youngest students (K-2), Cooperative and Individual were weakly correlated ($r = .12$, positive but not significant), but were weakly but negatively correlated for the 3-4 group ($r = -.17$). However, the negative correlation was statistically significant for the oldest (5-6) group ($r = -.32$). Finally, the correlation between Individual and Competition was significantly positive ($r = .36$) for the youngest group (K-2), but was not significant for the other two groups. In general, there was support for (a) a close association between Mastery and Intrinsic goals, and (b) positive associations among most of the motivational scales except that between Individual and Cooperative scales. However, by observing the inter-factor correlations there was no clear support for a better differentiation among the constructs due to student maturity.

Nevertheless, an inspection of the mean scores of the five scales for each year group found that all the scores tended to be high for the K-2 group (ranging from 4.13 to 4.63), whereas there was greater variability in the older groups. The descriptive statistics for each of the scales in three year groups are presented in Table 4. For the K-2 group, repeated-measures ANOVA with the five scale scores as a within-subject factor found statistically significant difference among the scores, $F(4, 98) = 16.17, p < .001, \eta^2 = .41$. This result suggested that the five scales were similarly salient for this youngest group of students. However, for each of the older groups, the repeated-measures ANOVA found significant differences between the scales, $F(4, 89) = 49.02, p < .001, \eta^2 = .69$ for the 3-4 group; and $F(4, 76) = 40.94, p < .001, \eta^2 = .68$ for the 5-6 group. There was therefore partial support that the youngest students (K-2) tended to rate scales highly in comparison to the other groups.

Table 4
Means, Standard Deviations, and Correlations by Year Level

|       | Mean | SD | Mastery | Intrinsic | Coopert | Individ | Compet |
|-------|------|----|---------|-----------|---------|---------|--------|

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Kindergarten — Year 2 (n = 102)
Mastery    4.63   0.40   1
Intrinsic  4.45   0.62   .45**     1
Coopert    4.25   0.84   .11       .26**      1
Individ    4.19   0.78   .36**     .26**      .12       1
Compet     4.13   0.93   .50**     .27**      .39**     .36**     1
Year 3 — Year 4 (n = 93)
Mastery    4.54   0.61   1
Intrinsic  4.17   0.86   .57**     1
Coopert    3.58   0.94   .32**     .41**      1
Individ    4.46   0.68   .36**     .32**      −.17      1
Compet     2.89   1.24   .24*      .17        .34**     .02       1
Year 5 — Year 6 (n = 80)
Mastery    4.14   0.78   1
Intrinsic  3.89   1.00   .59**     1
Coopert    3.32   1.03   .37**     .45**      1
Individ    4.33   0.78   .27*      .31**      −.32**    1
Compet     2.63   1.09   .32**     .37**      .42**     .11       1
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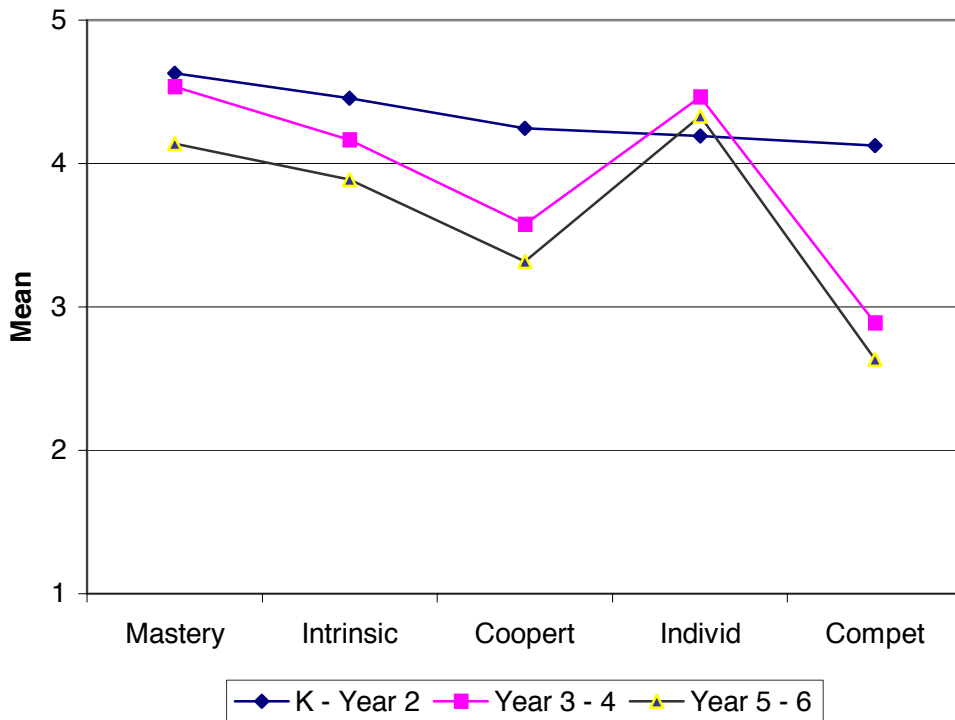*Note:* Scores on a scale of 1 to 5. $*p < .05, **p < .01$.



*Figure 1.* Mean scores for the RMQ across three groups
*Note*: The RMQ scales were: Mastery, Intrinsic, Cooperative (Coopert), Individual (Individ), and
Competition (Compet).

*Group Comparisons*

A MANOVA was conducted with the five scales scores (Mastery, Intrinsic, Cooperative, Individual, and Competition) as dependent variables and group (K-2, 3-4, and 5-6) as an independent variable. The multivariate test was significant, $F(10, 536) = 13.17, p < .001, \eta^2 = .20$ (using Wilks' lambda).

For Mastery, the youngest group (K-2) had the highest scores ($M = 4.63$), followed by the 3-4 group ($M = 4.54$), whereas the oldest (5-6) group had the lowest scores ($M = 4.14$). The between-group difference was statistically significant, $F(2, 272) = 15.95, MSE = 0.36, p$

$< .001, \eta^2 = .11$. Follow-up contrasts showed that K-2 students had higher Mastery scores than the 3-4 students, who had higher scores than the 5-6 students.

For Intrinsic, the youngest group (K-2) had the highest scores ($M = 4.23$), followed by the 3-4 group ($M = 4.17$), whereas the oldest (5-6) group had the lowest scores ($M = 3.89$). The between-group difference was statistically significant, $F(2, 272) = 10.50, MSE = 0.68, p < .001, \eta^2 = .07$. Follow-up contrasts showed that K-2 students had higher Intrinsic scores than 3-4 students, who had higher scores than 5-6 students.

For Cooperative, the youngest group (K-2) had the highest scores ($M = 4.25$), followed by the 3-4 group ($M = 3.58$), whereas the oldest (5-6) group had the lowest scores ($M = 3.32$). The between-group difference was statistically significant, $F(2, 272) = 24.66, MSE = 0.87, p < .001, \eta^2 = .15$. Follow-up contrasts showed that K-2 students had higher Cooperative scores than 3-4 students, who had higher scores than 5-6 students.

For Individual, the pattern of results was in the opposite direction. The scores were the lowest for the youngest (K-2) group ($M = 4.19$) and higher for the 3-4 group ($M = 4.46$), whereas the oldest (5-6) group had the highest scores ($M = 4.33$). The between-group difference was statistically significant, $F(2, 272) = 3.12, MSE = 0.56, p < .001, \eta^2 = .02$. Follow-up contrasts showed that K-2 students had higher Cooperative scores than 3-4 students, who had higher scores than 5-6 students.

For Competition, the youngest group (K-2) had the highest scores ($M = 4.13$), followed by the 3-4 group ($M = 2.89$), whereas the oldest (5-6) group had the lowest scores ($M = 2.63$). The between-group difference was statistically significant, $F(2, 272) = 50.45, MSE = 1.19, p < .001, \eta^2 = .27$. Follow-up contrasts showed that K-2 students had higher Competition scores than 3-4 students, who had higher scores than 5-6 students. Overall, the results suggested that except for the factor of Individual, there might be a downward trend in the primary students' motivational goal development as they mature (see Figure 1).

### Discussion

The present study addressed the need to develop a multi-dimensional domain specific measure of motivation. On the basis of the Marsh et al. (2003) instrument that has summarized a range of motivation measures, we developed a multi-dimensional RMQ that was presumed to be useful for tapping into young readers' reading goal orientations. Confirmatory factor analysis found the instrument had good psychometric properties for young children. The five a priori factors (Mastery, Intrinsic, Cooperative, Individual, and Competition) were distinguishable from one another and the correlations among them were reasonable and logical. As expected on the basis of previous research (e.g., Marsh, Craven, & Debus, 1999, the youngest students (K-2nd grade) were less able to differentiate the factors than older students (3rd-6th grade). Interestingly, the oldest students showed the greatest differentiation between the Individual and Cooperative factors.

Motivation in students is considered to be highly influential on the outcomes of school (Martin, 2003; Martin, Marsh & Debus, 2001, 2003; McInerney, 1995; McInerney, Roche, McInerney, & Marsh, 1997; Pintrich & DeGroot 1990; Schunk 1990; Yeung & McInerney, 2005), as students with stronger motivation achieve more at school. Motivation research has concentrated on general school motivation and there are instruments available to consider general school motivation (Marsh et al., 2003). Reading competence is critical for school and life success and students must be motivated to learn to read. The RMQ is an instrument that considers the specific motivation of students in the process of reading. The validation of the RMQ for this sample provides an encouraging starting point in domain-specific motivational research for elementary school students.

In examining the developmental trends of the young children's reading goals, a pattern of decline for age was found in four of the factors. The Individual factor was the only exception, and the score for this factor was lowest for the youngest students. Young children

experience difficulty differentiating between their own perceptions and the perceptions of others. Young children generally report their own point of view when asked to consider how others feel (Ruffman & Olson, 1989). This egocentric nature of young children (Astington, 1993; Piaget & Inhelder, 1956) makes it difficult for them to consider their motivation in relation to others (i.e., peers and teachers). These findings that are consistent with expectations based on theory and empirical studies together with the demonstrated psychometric properties of the instrument suggest that the RMQ may be a useful tool for researchers and practitioners in the fields of motivation and reading intervention research.

*Implications for teachers and education practitioners*. Teachers and educational practitioners now have a new multi-dimensional instrument to measure the motivation of students in the critical area of reading. Teachers need to find ways to motivate children to attend to, persevere with, and master the skills of reading. The RMQ allows teachers to identify what currently motivates their students to read and develop strategies and resources to encourage their students' future motivation in reading. It also assists teachers to evaluate the effectiveness of interventions by validly and reliably measuring their students' growth (or decline) in motivation in specific dimensions associated with reading.

*Implications for further research*. The School Motivation Questionnaire (SMQ; Marsh et al., 2003) has been successfully adapted to create the new Reading Motivation Questionnaire (RMQ). By adapting the SMQ to address specific motivational goals of students that are specific to the domain of reading in the school context, we were able to measure the multidimensional facets of reading motivation in students. This finding implies that appropriate adaptations of the Marsh et al. (2003) SMQ may lead to psychometrically sound instruments in domain-specific areas of motivation (e.g., numeracy, spelling). Such development in psycho-social measurement may result in a repertoire of instruments for teachers and researchers to better understand the motivation of children in specific skill areas.

*Limitations*. The pilot study of this new multidimensional instrument was conducted at an independent girls' school with 275 children. This limited sample size and the nature of the sample (e.g., only girls were included) restricted the application of more statistical analyses such as group invariance of factor structure, gender differences, etc. Hence conclusions drawn from this analysis should be treated with caution and may not generalise to other samples (e.g., boys, high school, etc.). Further testing of the instrument with a wider sample including boys is required to fully validate the RMQ instrument.

In summary, this paper has described the development and pilot testing of a new multidimensional motivation instrument that specifically addresses the motivation of young children in relation to reading. The new multidimensional instrument, the *Reading Motivation Questionnaire (RMQ),* was developed to measure children's motivation towards reading on five scales: Mastery, Intrinsic, Cooperative, Individual, and Competition. The instrument provides researchers and educators with a valid instrument to assess the motivational goals of elementary students, examine their development, and devise teaching and learning strategies based on theory and evidence.

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