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Utility of reading – predictor of reading achievement?

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### **Abstract**

Utility value as a subcomponent of expectancy-value models of motivation has been confirmed as a predictor of achievement(-related behavior) in the context of mathematics and science. Research on language-related domains, in contrast, has been scarce, and little is known on how utility value affects reading behavior and achievement. Therefore, the present study aimed at researching the interrelations of utility of reading, other reading motivational constructs, reading achievement and reading behavior. The German dataset of PISA 2009, comprising data of 9461 students of grade 9, was used. Structural equation models show that utility of reading is a motivational factor related to but distinct from self-concept and intrinsic task value, that it is related to reading achievement, and that this relation is mediated by reading behavior. While this indicates a starting point for reading motivation interventions, limitations regarding the assessment of utility of reading and regarding the cross-sectional study design are discussed.

Key words: utility value of reading, reading achievement, reading motivation, expectancy-value model of achievement, reading behavior

## Utility of reading – predictor of reading achievement?

### 1 Introduction

Reading is a key skill in our information society. It is necessary, for example, in order to stay up to date with rapidly expanding professional knowledge, or to take part in societal and cultural activities. Proficient reading is more than just decoding, it also encompasses interpreting text in a larger context (OECD, 2009a). Unfortunately, PISA studies repeatedly showed that a high percentage of students do not dispose of high reading skills (Kirsch et al., 2002). Moreover, the same studies also show that a high percentage of students do not read in their leisure time (OECD, 2010). This is a disquieting result, as frequent reading is supposed to enhance reading skills (Anderson, Wilson, & Fielding, 1988; Guthrie, Wigfield, Metsala, & Cox, 1999; Pfof, Dörfler, & Artelt, 2013).

Several intervention approaches tackle these unsettling findings. While there has been a lot of work on enhancing reading abilities (e.g., National Institute of Child Health and Human Development, 2000) and intrinsic motivation to read (e.g., Guthrie et al., 1998), a different motivational construct has been fairly neglected: utility value. It refers to whether the activity in question is useful for one's goals. While it is preferable that students read because they like the activity (intrinsic task value), research from domains like mathematics or science show that also utility value plays a motivating role for activities that are not liked in the first place, and achievement therein (Cole, Bergin, & Whittaker, 2008; Eccles & Harold, 1991; Hulleman, Durik, Schweigert, & Harackiewicz, 2008; Husman & Hilpert, 2007). Moreover, research shows that utility value is susceptible to manipulation (Hulleman, Godes, Hendricks, & Harackiewicz, 2010) which makes utility value a possible intervention variable.

However, research on utility of reading is scarce. It is the aim of the current paper to contribute to a better understanding whether utility value of reading might be a suitable

approach for promoting reading and reading literacy. Therefore, its relation to reading achievement, reading behavior and other variables of reading motivation is studied. In the following, the construct of utility value is introduced within the context of expectancy-value theory of achievement motivation (Eccles & Wigfield, 2002) and its relation to achievement and achievement-related behavior is described. Subsequently, utility value of reading and the (limited) research on it are discussed. After this, data of a German supplementary study to the PISA 2009 assessment on utility value of reading and its ability to predict reading achievement of 9<sup>th</sup> graders are analyzed and discussed.

### **1.1 Utility value**

The utility of a task is supposed to be a motivational determinant of performance (e.g., Eccles & Wigfield, 2002). Utility value is part of the expectancy-value model of achievement behavior by Eccles and colleagues (Eccles (Parsons), Adler, & Meece, 1984; Eccles & Wigfield, 2002). They differentiate motivational antecedents of achievement into an expectancy component (expectations of success) and a value component (subjective task value) that both directly influence performance-related choices and performance. While the expectancy component refers to the expectation of success in a concrete task (cf. "self-efficacy", e.g., Bandura, 1997), their model also includes the self-concept of one's ability as a determinant of expectation of success. Yet, self-concept and self-efficacy are not empirically distinguishable (Eccles & Wigfield, 2002). The value component includes intrinsic task value (enjoyment of the task or interest in the task), attainment value (the personal importance of doing well in the task), cost (e.g., anxiety, opportunity cost) and utility value (Eccles, 2005). Utility value is defined as "how well a task relates to current and future goals, such as career goals" (Eccles & Wigfield, 2002, p. 120).

Closely related to this construct, but stemming from a different theoretical background, is instrumentality in the context of future time perspective (Lens, 1988). There, instrumentality is defined as „the perception that a completion of a task will directly increase the probability of achieving a future goal“ (Husman, Derryberry, Crowson, & Lomax, 2004, p. 64). Husman and colleagues' concept of instrumentality is basically synonymous to the presented notion of utility, but emphasizes the future aspect. For the present study, the expectancy-value framework by Eccles et al. was adopted, but it will occasionally be referred to research from future time perspective.

Researchers in the Eccles et al. tradition often leave out the cost and/or do not distinguish empirically between the four respectively three task values. Often, they differentiate only between intrinsic task value on the one hand and importance as a combination of attainment value and utility value on the other hand (Chow, Eccles, & Salmela-Aro, 2012; Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002; Meece, Wigfield, & Eccles, 1990). These researchers argue that the constructs are closely related (Durik, Vida, & Eccles, 2006) or that it is common to do so (Chow et al., 2012). However, research has shown that the different value components are empirically distinguishable (Eccles & Wigfield, 1995; Steinmayr & Spinath, 2010) which makes it worthwhile to analyze, for example, effects of utility value on its own and in relation to the other constructs.

## **1.2 Effects of utility value on achievement and achievement-related behavior**

While there has been much research on the expectancy component (also in the context of self-efficacy and self-concept research) and on intrinsic task value (also in the research traditions of intrinsic motivation, interest, and flow theory; see Wigfield & Eccles, 2000), utility value has been studied to a lesser extent. Previous studies show, however, that utility value has a positive influence on achievement and achievement-related behavior (Cole et al.,

2008; Eccles & Harold, 1991; Hulleman et al., 2008; Husman & Hilpert, 2007; Updegraff, Eccles, Barber, & O'Brien, 1996). For example, Husman and Hilpert (2007), drawing on future time perspective, were able to show that utility value was positively related to performance in a basic mathematics course on university level. This effect also held when self-efficacy was controlled for. The positive effect of utility value seemed to be mediated by self-regulatory study strategies.

The positive effects of utility value on achievement are most probably mediated by achievement-related behavior such as effort (Cole et al., 2008), strategies used (Husman & Hilpert, 2007) or academic choices (Updegraff et al., 1996). Updegraff et al. (1996) were able to show that utility value and self-efficacy predicted the number of math classes taken by 10<sup>th</sup> graders while controlling for gender, mathematics abilities and grade point average in mathematics. Interest was no significant predictor.

While the former studies were of correlational nature, although partly longitudinal, Hulleman et al. (2010) enhanced the utility value of mathematics respectively psychology by means of an intervention. The participants (university students) had to write an essay that either referred to the relevance of the current topic to their lives or not. This manipulation not only influenced the perceived utility of the topic, but additionally affected interest and performance. This study shows that utility value is influenceable, and it provides strong evidence for a causal relation of utility value and achievement.

### **1.3 Utility of reading**

The literature review in the previous paragraph shows that a majority of the research on utility value has been done in the context of mathematics or science. However, it is to expect that utility value also plays a role in the domain of reading.

With regard to language-related research, utility value assessments often refer to the language-arts subject, e.g. English (Cole et al., 2008), and not to reading. Only in elementary school, utility value of reading has been assessed (Durik et al., 2006; Eccles & Harold, 1991). This is probably the case because utility of reading might be difficult to assess in higher grades: Typical utility items might be (mis-)understood as items referring solely to the utility of being able to decode text, while reading encompasses also skills of, for example, interpreting text, which is subject of language-art courses. Assessing utility value of the language-art subject, however, bears the difficulty that this not only includes reading but also producing text (e.g., writing an essay).

Eccles and Harold (1991) assessed the effect of utility value of language arts on free time spent with reading and found correlations of .38 (girls) and .34 (boys) respectively. Durik et al. (2006) used a combined measure of utility and attainment value and termed it importance. In their longitudinal study, they assessed self-concept, intrinsic task value and importance of reading in 4<sup>th</sup> grade and of English in 10<sup>th</sup> grade and related these to grades and achievement-related choices, namely self-reported reading for leisure, language-related course choices and career aspirations related to literacy. With regard to importance, they found that 4<sup>th</sup> grade importance predicted 8<sup>th</sup> grade English grade and 10<sup>th</sup> grade importance. Tenth grade importance, on the other hand, predicted career aspirations and course choices, but not reading for leisure.

To sum up: The studies by Durik et al. (2006) and Eccles and Harold (1991) showed that utility value of reading might have an impact on reading-related choices and achievement. However, Durik et al. (2006) did not assess utility value per se, but a combination of utility value and attainment value, and they were not able to assess the interplay of intrinsic value, self-concept and importance in one model due to high intercorrelations. Eccles and Harold (1991) on the other hand only assessed reading behavior, but not reading achievement.

However, both the presented studies and theoretical considerations lead to the assumption that utility value might not only play a role for mathematics and science, but also for reading. In research on reading motivation, reading behavior is usually seen as a potential mediator of effects of reading motivation on reading achievement (Schiefele, Schaffner, Möller, & Wigfield, 2012). Reading behavior is related to reading achievement. For example, the amount of reading is positively related to reading comprehension (Mol & Bus, 2011). Therefore, we can understand reading behavior as a kind of achievement-related choice in the context of reading. Thus, effects of utility value on reading achievement can be assumed to be mediated by reading behavior.

#### **1.4 Research questions**

The present study aimed at analyzing the potential of utility value of reading as a possible motivational variable that might affect reading literacy. The interrelations of utility value of reading with reading achievement and reading behavior are studied in the context of the expectancy-value model of achievement (Eccles & Wigfield, 2002) and are therefore related to self-concept of reading as an expectancy component and to intrinsic task value as the most often studied value component. The research questions for the present study are:

1. How is utility value of reading related to intrinsic task value and self-concept of reading? Prior research (Eccles & Wigfield, 1995; Steinmayr & Spinath, 2010) has shown that the different value components can be differentiated empirically. Therefore, it is expected that utility value of reading is an independent motivational construct that is nevertheless positively related to self-concept of reading and intrinsic task value.
2. Does utility value relate to reading achievement, and if so: Does it explain variance in reading achievement above the relationships of self-concept and intrinsic task value with reading achievement?



It is expected that utility value is positively related to reading achievement analogously to previous results (Durik et al., 2006; Husman & Hilpert, 2007) and that it explains, also analogously to previous results (Husman & Hilpert, 2007; Updegraff et al., 1996), additional variance above the relationships of self-concept and intrinsic task value with reading achievement.

### 3. Are these relationships mediated by reading behavior?

It is expected that the relationship of utility value with reading achievement is mediated by reading behavior since reading motivation effects are assumed to function this way (Schiefele et al., 2012) and reading behavior is positively related to reading achievement (Mol & Bus, 2011).

## 2 Method

### 2.1 Sample

Participants were 9461 students taking part in a German national supplementary study to the international PISA 2009 assessment (Klieme & Deutsches Institut für Internationale Pädagogische Forschung, 2013). In the supplementary study, students were provided with both the international assessment and additional national instruments. This study was designed to be representative for 9<sup>th</sup> graders in Germany. The sampling procedure contained two stages: First, schools were sampled; second, within the sampled schools two classes of grade 9 were drawn. Participants were between 12 and 19 years old with a (unweighted) mean age of 15.61 years ( $SD = 0.63$ ). The weighted mean age of the sample (more on weights in 2.3 Analysis) was 15.62 years ( $SD = 0.62$ ). Due to the different sampling procedure in the international PISA study (which was designed to be representative for all 15-year-olds), only 1645 of these participants were also part of the international PISA dataset.

## 2.2 Measures

### 2.2.1 Utility value of reading

Utility value of reading was assessed with nine items in the German national student questionnaire. A sample item was “Reading helps to pursue own goals“. An English translation of all items can be found in the appendix. The items were assessed on a 4-point Likert scale. Their internal consistency was very good (Cronbach’s  $\alpha = .88$ ).

### 2.2.2 Reading self-concept

Reading self-concept was also part of the German national student questionnaire and was assessed with three items on a 4-point Likert scale. A sample item was “I am convinced that I can understand very difficult texts“. An English translation of all items can be found in the appendix. Their internal consistency was good (Cronbach’s  $\alpha = .76$ ).

### 2.2.3 Intrinsic task value

Intrinsic task value was assessed as part of the international student questionnaire. This scale comprises 11 items that were filled in on a 4-point Likert scale. A sample item was “Reading is one of my favourite hobbies“. All items can be found in OECD (2009a) where the scale is termed *reading attitude*, or in the appendix. The internal consistency in the present sample was very good (Cronbach’s  $\alpha = .92$ ).

### 2.2.4 Reading achievement: reading literacy test

For assessing reading achievement, the reading literacy test of the international PISA study was used. A comprehensive description of the PISA 2009 reading literacy test can be found in OECD (2009a) and OECD (2012).

### 2.2.5 Reading behavior

For reading behavior, the five items of the scale *reading diversity* from the international student background questionnaire were used (OECD, 2009a). The items began with the question “How often do you read these materials because you want to?” and referred to magazines, comic books, fiction, non-fiction and newspapers. The students had to tick one of five boxes regarding their frequency of reading, ranging from “never or almost never” to “several times a week”. The internal consistency was only sub-optimal (Cronbach’s  $\alpha = .51$ ). However, due to the diverse nature of the inquired kinds of literature, this was not unexpected. It was decided to nevertheless use this scale, because utility of reading might not only affect reading of fiction, which is most highly correlated with overall time spent with reading for enjoyment, but also reading of other material. Moreover, the main results do not change substantially when instead of this scale only the two items *reading for enjoyment* (“About how much time do you usually spend reading for enjoyment?”, likewise answered by ticking one of five boxes) and *frequency of reading fiction* (from the above-mentioned reading diversity scale) are used, which have a high internal consistency (Cronbach’s  $\alpha = .83$ ).

### 2.2.6 Potential moderating variables

Reading behavior and reading achievement are often associated with gender (Lietz, 2006; Logan & Johnston, 2009), socio-economic status (Caro & Lehmann, 2009; Marks, 2005; Reardon, 2003), migration background (Marks, 2005; Stanat, Rauch, & Segeritz, 2010) and type of school or school track as indicator of overall achievement (Pfof & Artelt, 2013; Schaffner, Philipp, & Schiefele, in press). Thus, these were used in order to control for potential moderating effects. Type of school was differentiated into lower academic track

school („Hauptschule“), middle academic track school („Realschule“), comprehensive school („integrierte Gesamtschule“) and higher academic track school („Gymnasium“). Socio-economic status was operationalized as the highest occupational status of the parents (HISEI). For both HISEI and migration status (“native”, “second generation immigrants”, or “first generations immigrants”), indices provided by the OECD (2012) were used.

### 2.3 Analyses

Analyses were done with SPSS 21 for descriptive data and Mplus 7 for complex analyses. As recommended by the OECD (2009b), student weights (SPSS and Mplus) and replicate weights (Mplus) were used in order to account for the two-step sampling procedure and the nestedness of the data structure (Mplus commands *type=complex*, *weight is* and *repweights are*). Student weights procure a valid estimation of population parameters. Replicate weights serve to validly estimate standard errors for hypothesis testing. More information about the rationale and application of student and replicate weights can be found in OECD (2009b). In Mplus, the FIML option handled missing values. Across all analyses, about 5-10 % of the data were missing. When reading literacy was included into the analysis, the Mplus command *type=imputation* was used to process the five plausible values that were provided (OECD, 2009b). Motivational variables and reading behavior were modelled as latent factors in structural equation models (SEMs, see Figures 1 and 2).

## 3 Results

Descriptive characteristics of the used items are included in the appendix.

### 3.1 Relation of utility value to other motivational constructs

In order to assess the first research question on the relation of utility value to intrinsic task value and reading self-concept, a confirmatory factor analysis (CFA) with all 23 items was conducted in Mplus. Three models were tested: the theoretically predicted three-factor solution, a two-factor solution with a value component factor (intrinsic task value and utility value) and an expectancy component factor (reading self-concept), and a one-factor solution. The three-factor solution showed, as expected, the best fit (Table 1). The latent factor of utility value correlated moderately with latent intrinsic task value ( $r = .42$ ) and latent self-concept of reading ( $r = .44$ ), which themselves correlated with  $r = .37$ . Therefore, the distinctiveness of utility value and its moderate relation to other constructs was confirmed.

*Table 1.* Model fits of confirmatory factor analyses on items of utility value, intrinsic task value and reading self-concept.

|                   | RMSEA | SRMR | AIC        | BIC        |
|-------------------|-------|------|------------|------------|
| 1-factor solution | .13   | .13  | 480464.405 | 480955.252 |
| 2-factor solution | .12   | .12  | 475599.930 | 476097.890 |
| 3-factor solution | .07   | .05  | 453950.430 | 454462.618 |

*Note.*  $\chi^2$  statistics and model tests not available due to replicate weights.  $N = 9079$ .

### 3.2 Utility value as predictor of reading achievement

With regard to the second research question, whether utility value of reading relates to reading achievement, a series of SEMs was conducted in order to specify how much variance of reading achievement can be explained by utility value of reading both alone and in addition to other motivational predictors (see Figure 1 for the models and Table 2 for all path coefficients and fit indices). First, an SEM with utility as single predictor of reading

achievement (Figure 1A) revealed a positive relation of  $\beta_{\text{uti}} = .22$  with reading achievement. However, when self-concept was included as a second predictor (Figure 1B), the relation decreased to  $\beta_{\text{uti}} = .10$ . When intrinsic task value instead of self-concept was included as second predictor (Figure 1C),  $\beta_{\text{uti}}$  became close to zero, although still significant ( $\beta_{\text{uti}} = .03$ ). And last but not least, the relationship turned slightly negative ( $\beta_{\text{uti}} = -.04$ ) when all three motivational constructs were entered as predictors for reading achievement (Figure 1D).

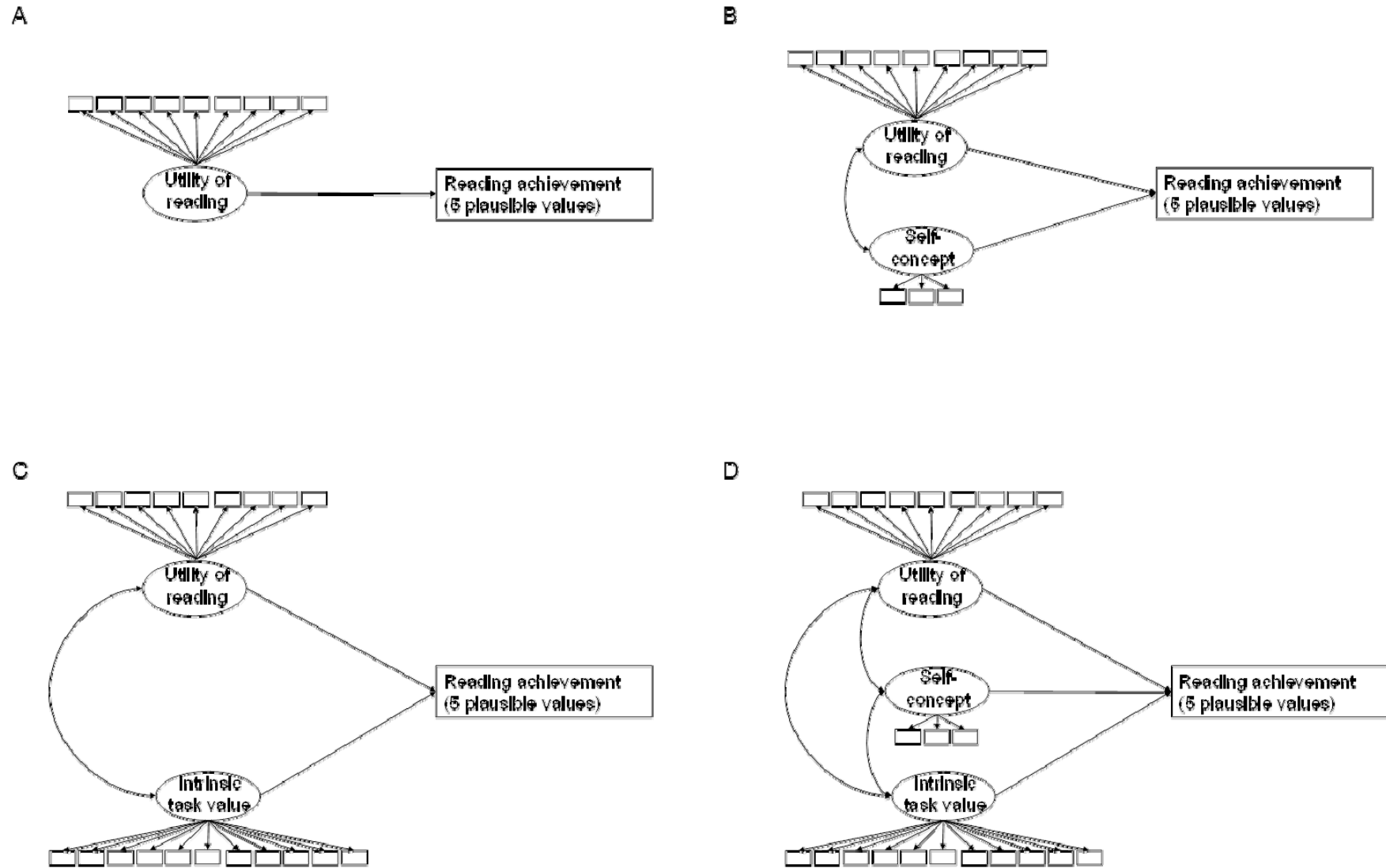


Figure 1. Series of structural equation models (A-D) on the relation of motivational constructs and reading achievement.

Table 2: Standardized coefficients for four different structural equation models (A-D) on motivational constructs predicting reading achievement

| Predictor(s)  | A   | B   | C   | D    |
|---|-----|-----|-----|------|
| <b>predicting reading achievement</b>                 |     |     |     |      |
| utility value of reading                              | .22 | .10 | .03 | -.04 |
| self-concept of reading                               |     | .28 |     | .19  |
| intrinsic task value                                  |     |     | .47 | .43  |
| <b>interrelations of predictors</b>                   |     |     |     |      |
| utility value of reading with self-concept of reading |     | .45 |     | .45  |
| utility value of reading with intrinsic task value    |     |     | .42 | .42  |
| self-concept of reading with intrinsic task value     |     |     |     | .37  |
| RMSEA   | .11 | .08 | .07 | .06  |
| SRMR  | .06 | .05 | .05 | .05  |

Note. All  $\beta$  were significant.

### 3.3 Mediation by reading behavior

In order to answer the third research question regarding a possible mediation of the above relationships by reading behavior, the same series of SEMs was conducted again with reading behavior as mediator in between motivational constructs and reading achievement (Figure 2). Detailed results are shown in Table 3. It was found that the relationship of utility value as single predictor of reading achievement was fully mediated by reading behavior (Figure 2A). When included together with self-concept (Figure 2B), the effects of self-concept and utility were partially mediated by reading behavior, while the direct effect of utility value on reading achievement turned negative ( $\beta_{uti} = -.10$ ). When utility and intrinsic task value were included as predictors (Figure 2C), the effect of intrinsic task value was



partially mediated by reading behavior. The very small but significant effect of utility on reading achievement ( $\beta_{\text{uti}} = .03$  in model 1C) was fully mediated by reading behavior (decreasing to  $\beta_{\text{uti}} = .02$  in model 2C), yet from a practical point of view this can be neglected. What is noticeable is the very high path coefficient of .90 from intrinsic task value to reading behavior. This inspired additional analyses (see next section) on the relation of intrinsic task value and reading behavior. When all three motivational constructs were predictors (Figure 2D), only the effect of intrinsic task value was partially mediated by reading behavior. The mediated effects of both self-concept and utility value were neglectable.

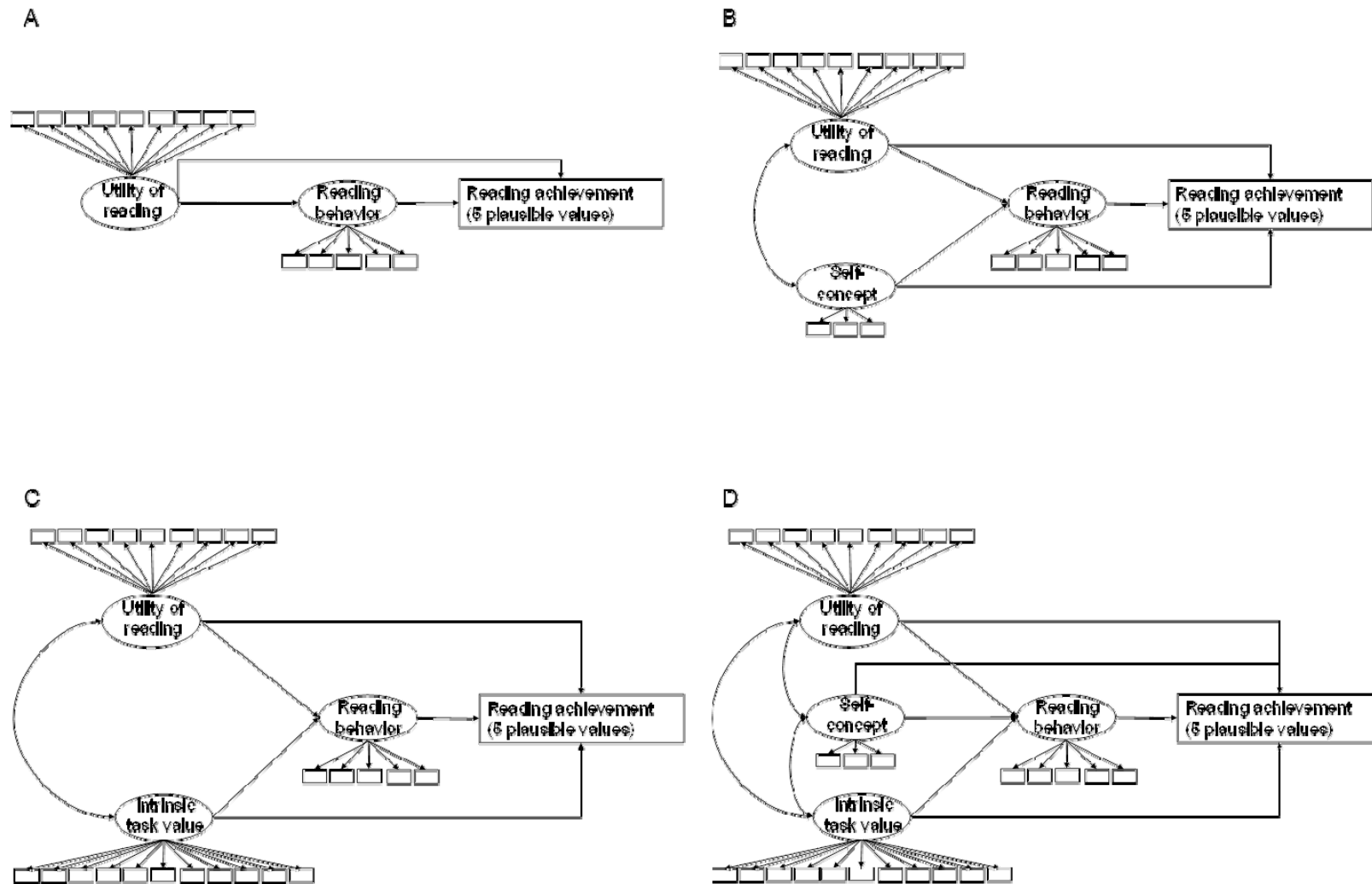


Figure 2. Series of structural equation models (A-D) on the relation of motivational constructs and reading achievement, mediated by reading behavior.

Table 3: Standardized coefficients for four different structural equation models (A-D) on motivational constructs predicting reading achievement mediated by reading behavior

| Predictor(s)  | A    | B    | C                | D    |
|---|------|------|------------------|------|
| <b>path on mediator reading behavior</b>                                  |      |      |                  |      |
| utility value of reading  | .52  | .39  | .04              | .03  |
| self-concept of reading   |      | .30  |                  | .04  |
| intrinsic task value  |      |      | .90              | .89  |
| <b>direct path on reading achievement</b>                                 |      |      |                  |      |
| utility value of reading  | -.06 | -.10 | .02 <sup>x</sup> | -.04 |
| self-concept of reading   |      | .13  |                  | .18  |
| intrinsic task value  |      |      | .24              | .22  |
| reading behavior  | .54  | .50  | .25              | .23  |
| <b>interrelations of predictors</b>                                       |      |      |                  |      |
| utility value of reading with self-concept of reading                     |      | .45  |                  | .45  |
| utility value of reading with intrinsic task value                        |      |      | .41              | .42  |
| self-concept of reading with intrinsic task value                         |      |      |                  | .37  |
| <b>indirect effect of ... on reading achievement via reading behavior</b> |      |      |                  |      |
| utility value of reading  | .28  | .20  | .01              | .01  |
| self-concept of reading   |      | .15  |                  | .01  |
| intrinsic task value  |      |      | .23              | .20  |
| RMSEA   | .09  | .07  | .07              | .06  |
| SRMR  | .06  | .05  | .06              | .05  |

Note. All  $\beta$  were significant unless marked otherwise.

<sup>x</sup> non-significant.

### 3.4 Additional analyses

As there was such a strong connection of intrinsic task value and reading behavior in the mediator analyses, it was checked how closely the two constructs themselves were related. Therefore, a CFA with the items of intrinsic task value and reading behavior was conducted. The fit indices of the 1-factor solution were merely different from the 2-factor solution (Table 4). In the 2-factor solution, the two latent factors correlated with .91, while the manifest correlation of the two scales was only .47. The manifest correlation of intrinsic task value with the more consistent short reading behavior scale is .84 (the latent correlation being .97).

*Table 4.* Model fits of confirmatory factor analyses on items of intrinsic task value and reading behavior.

|                   | RMSEA | SRMR | AIC        | BIC        |
|-------------------|-------|------|------------|------------|
| 1-factor solution | .089  | .055 | 378818.462 | 379159.432 |
| 2-factor solution | .089  | .054 | 378705.630 | 379053.703 |

*Note.*  $\chi^2$  statistics and model tests not available due to replicate weights.  $N = 8987$ .

Since one could argue that the intrinsic task value scale encompasses items that could be interpreted as behavioral items referring to the frequency of reading, all analyses were repeated with questionable items excluded from the intrinsic task value scale (see appendix for excluded items). The manifest correlation of the shortened intrinsic task value scale with the more consistent reading behavior scale was .77, the latent was .91. Therefore, the two constructs seem to be very closely related empirically, although they are conceptually different. The reported results did not change substantially when the shortened intrinsic task value scale was used.

### 3.5 Moderation analyses

In a series of SEMs, possible moderating effects of socio-economic status, gender, school type, and migration status were checked. For socio-economic status and gender, the results did not change in a substantial way. With regard to school type, there was a stronger relation of utility value with reading achievement (Figure 1A) for students of the higher academic track („Gymnasium“) compared to students of the lower academic track („Hauptschule“) ( $\beta = .23$  vs.  $\beta = .14$ ), but no further group differences. As for migration status, native students and first generation immigrant students differed in a consistent way (Tables 5, 6): There was a higher relationship of utility value and reading achievement for native students than for immigrant students. This seems to be due to a higher association of reading behavior and reading achievement. This could be confirmed in a separate model where reading achievement was predicted by reading behavior only and no other variables were included ( $\beta_{im} = .21$  vs.  $\beta_{nat} = .56$ )<sup>1</sup>. Moreover, it seems that, when controlling for the mediating effect of reading behavior, reading self-concept was a stronger (direct) predictor of reading achievement for immigrants than for natives. Controlling for the HISEI did not change this pattern.

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<sup>1</sup> This difference still held if the more consistent short reading behavior scale was used, with  $\beta_{im} = .27$  vs.  $\beta_{nat} = .50$ .

Table 5. Standardized coefficients for four different structural equation models (A-D) on motivational constructs predicting reading achievement by migration status (native vs. first generation immigrants)

| Predictor(s)  | A          |            | B          |             | C          |            | D          |            |
|---|------------|------------|------------|-------------|------------|------------|------------|------------|
|   | nat        | im         | nat        | im          | nat        | im         | nat        | im         |
| <b>predicting reading achievement</b>                 |            |            |            |             |            |            |            |            |
| utility value of reading                              | <b>.24</b> | <b>.11</b> | <b>.12</b> | <b>-.02</b> | .04        | -.02       | -.02       | -.10       |
| self-concept of reading                               |            |            | .27        | .35         |            |            | <b>.16</b> | <b>.31</b> |
| intrinsic task value                                  |            |            |            |             | <b>.49</b> | <b>.29</b> | <b>.45</b> | <b>.23</b> |
| <b>interrelations of predictors</b>                   |            |            |            |             |            |            |            |            |
| utility value of reading with self-concept of reading |            |            | .46        | .35         |            |            | .46        | .35        |
| utility value of reading with intrinsic task value    |            |            |            |             | .42        | .43        | .42        | .43        |
| self-concept of reading with intrinsic task value     |            |            |            |             |            |            | <b>.38</b> | <b>.30</b> |
| RMSEA   | .10        |            | .08        |             | .07        |            | .06        |            |
| SRMR  | .06        |            | .06        |             | .06        |            | .06        |            |

Note. Bold coefficients are significantly different across groups. As migration status was categorical, multi-group models were computed. Due to the usage of replicate weights,  $\chi^2$  indices were not available, so it was not possible to apply  $\chi^2$  difference tests. Differences between the groups were checked for by computing 95% confidence intervals around each path coefficient and manually checking for overlap between the groups. Results are based on  $N_{\text{nat}} = 7325$ ,  $N_{\text{im}} = 460$ , and  $N_{2\text{im}} = 1012$  students. nat = native students; im = first generation immigrant students; 2im = second generation

immigrant students. Coefficients for second generation immigrant students are not displayed in the table.

*Table 6.* Standardized coefficients for four different structural equation models (A-D) on motivational constructs predicting reading achievement mediated by reading behavior by migration status (native vs. first generation immigrants).

| Predictor(s)  | A                      |                        | B                      |                        | C   |      | D          |            |
|---|------------------------|------------------------|------------------------|------------------------|-----|------|------------|------------|
|   | nat                    | im                     | nat                    | im                     | nat | im   | nat        | im         |
| <b>path on mediator reading behavior</b>              |                        |                        |                        |                        |     |      |            |            |
| utility value of reading                              | .54                    | .46                    | .40                    | .42                    | .04 | .06  | .03        | .05        |
| self-concept of reading                               |                        |                        | .32                    | .16                    |     |      | .04        | .00        |
| intrinsic task value                                  |                        |                        |                        |                        | .91 | .80  | .90        | .80        |
| <b>direct path on reading achievement</b>             |                        |                        |                        |                        |     |      |            |            |
| utility value of reading                              | -.09                   | .03                    | -.11                   | -.06                   | .03 | -.01 | -.03       | -.10       |
| self-concept of reading                               |                        |                        | <b>.09<sup>b</sup></b> | <b>.33<sup>b</sup></b> |     |      | <b>.15</b> | <b>.31</b> |
| intrinsic task value                                  |                        |                        |                        |                        | .20 | .32  | .18        | .26        |
| reading behavior                                      | <b>.61<sup>a</sup></b> | <b>.18<sup>a</sup></b> | <b>.58<sup>c</sup></b> | <b>.11<sup>c</sup></b> | .32 | -.04 | .30        | -.04       |
| <b>interrelations of predictors</b>                   |                        |                        |                        |                        |     |      |            |            |
| utility value of reading with self-concept of reading |                        |                        | .46                    | .35                    |     |      | .46        | .35        |
| utility value of reading with intrinsic task value    |                        |                        |                        |                        | .42 | .42  | .42        | .43        |
| self-concept of reading with intrinsic task value     |                        |                        |                        |                        |     |      | <b>.37</b> | <b>.31</b> |
| RMSEA   | .08                    |                        | .07                    |                        | .07 |      | .06        |            |
| SRMR  | .06                    |                        | .06                    |                        | .06 |      | .06        |            |



*Note.* Bold coefficients are significantly different across groups. As migration status was categorical, multi-group models were computed. Due to the usage of replicate weights,  $\chi^2$  indices were not available, so it was not possible to apply  $\chi^2$  difference tests. Differences between the groups were checked for by computing 95% confidence intervals around each path coefficient and manually checking for overlap between the groups. Results are based on  $N_{\text{nat}} = 7325$ ,  $N_{\text{im}} = 460$ , and  $N_{2\text{im}} = 1012$  students. nat = native students; im = first generation immigrant students; 2im = second generation immigrant students. Coefficients for second generation immigrant students are not displayed in the table.

- <sup>a</sup> If the more consistent short reading behavior scale was used, this difference lost its significance with  $\beta_{\text{nat}} = .48$  vs.  $\beta_{\text{im}} = .28$ .
- <sup>b</sup> If the more consistent short reading behavior scale was used, this difference lost its significance with  $\beta_{\text{nat}} = .16$  vs.  $\beta_{\text{im}} = .32$ .
- <sup>c</sup> If the more consistent short reading behavior scale was used, this difference lost its significance with  $\beta_{\text{nat}} = .45$  vs.  $\beta_{\text{im}} = .23$ .

#### **4 Discussion**

The present study aimed at analyzing the potential of utility value of reading as a possible motivational variable that might positively affect reading literacy. Therefore, its relation to intrinsic task value, self-concept, reading achievement, and reading behavior was researched. The study showed that utility value is a motivational construct that is independent from intrinsic task value and self-concept and correlates moderately with these variables. The study also showed that utility value is positively related to reading achievement, and that it explains variance of reading achievement in addition to the effect of self-concept on reading achievement, but not in addition to the effect of intrinsic task value.

However, intrinsic task value was very closely related to reading behavior which fully mediated the relationship of utility value and reading achievement.

These results confirm and extend prior research in several ways. First, it confirms results on subjective task value that the different value components can be distinguished empirically (Eccles & Wigfield, 1995; Steinmayr & Spinath, 2010). In the present study, utility value of reading and intrinsic task value of reading were clearly different constructs that were related to each other and to the expectancy component (self-concept of reading) in a moderate way. This speaks in favor of using the respective value constructs in research instead of an overall subjective task value.

Second, the present results extend prior findings on the relation of utility value and achievement in domains like mathematics or science to the domain of reading. It cannot be taken for granted that results would be similar in different domains, as this is not the case for other motivational constructs like self-concept (cf. Retelsdorf, Köller, & Möller, 2014). In the present study, a moderate relationship of  $\beta = .22$  of utility value and reading achievement was found. This parallels results of, for example, Cole et al. (2008) who found relations of about .10 to .25 with achievement for different domains while the relations were lower in English and social studies than in mathematics or science. The present study extends this research on utility of reading for 9<sup>th</sup> graders.

Third, that the effect of utility on reading achievement was mediated by reading behavior nicely fits with results on reading motivation and reading achievement. It is usually assumed that effects of reading motivation on reading achievement are mediated by actual reading behavior (Schiefele et al., 2012). The present study extends these finding to utility value as a different motivational construct.

It was found in the present study that utility value related to reading achievement above the impact of self-concept on reading achievement, but not above the impact of intrinsic task

value on reading achievement. This absence can easily be explained: Intrinsic task value and reading behavior were very closely related in the present study. As reading behavior acted as a mediator for the relationship of utility and reading achievement, including intrinsic task value as second predictor took the same variance as the mediator. The two-predictor model (1C) therefore was empirically almost the same as the reading behavior mediation model with utility as single predictor (2A). The close empirical relationship of intrinsic task value and reading behavior, however, does not mean that the two variables assessed the same construct. While items on reading behavior referred to the frequency and breadth of reading in leisure time, only about 50% of the items on intrinsic task value comprised a wording that could be interpreted as a reference to frequency or breadth of reading. This might account for some relation of intrinsic task value and reading behavior, but it cannot explain an intercorrelation of about .90 as was found in this study. Congruously, excluding these questionable items from intrinsic task value did not change the results substantially.

An interesting finding were the differential results for first generation immigrant students compared to native students. Overall, immigrant students seem to profit less from frequent and diverse reading than do native students, even when controlling for socio-economic status. One possible explanation for the migration status results might be the language in which students read. In the assessment of the reading behavior variables used here, it was not referred to a specific language. Therefore, it might be that immigrants did not read in German. A second explanation for this result might be that immigrants might not profit as much from their reading because they do not have a sufficient command of the German language to profit. On the other hand, immigrant students might choose easier literature than their native peers and therefore not profit as much as them. At least, the present results to some extent parallel the results of Schaffner et al. (in press) who found that the relationship of intrinsic reading motivation on reading achievement is lower for lower academic track

students than for higher academic track students. While this is not the case in the present study, it nevertheless might be part of the same phenomenon. Schaffner et al. (in press) explain their results with different reading amounts and differently challenging text material.

#### **4.1 Limitations and future research**

The present study has some limitations. One limitation might be that the study was done with students who were comparably old with regard to the development of reading literacy. It would be interesting to assess the influence of utility of reading with elementary school students who are learning to read.

A further limitation for the interpretation of the present study is the high intercorrelation of reading behavior and intrinsic task value. Therefore, it could not be disentangled whether the relationship of utility value is mediated by reading behavior or whether utility value does not contribute to reading achievement once intrinsic task value is controlled for, or whether even intrinsic task value mediates effects of utility. Longitudinal and experimental studies are therefore desirable to corroborate the current results. Another issue in this context was the sub-optimal internal consistency of the reading behavior scale which might limit the reliability of the results. However, additional analyses with a more consistent scale showed no substantially different results.

#### **4.2 Conclusion**

The detected positive relationships of utility with reading behavior and reading achievement indicate that utility value of reading might be an interesting starting point for further research on interventions to enhance reading motivation and reading literacy. First of all, further longitudinal and experimental studies have to clarify whether utility value can provide a unique contribution to reading achievement and reading behavior above intrinsic

task value. If this is the case, interventions might be conceptualized. These interventions could focus on enhancing the utility value of reading for students. This might be done, for example, by means of a whole teaching unit on why and for what reading might be important and useful – beyond being able to decode text. On the smaller side of the scale, interventions might be just little insertions into regular teaching that focus on the utility of reading, like an introductory or summarizing sentence in every teaching unit that deals with the utility of reading in this teaching context.

All in all, the present study provides interesting results with regard to utility of reading, which is an underresearched area. Studying it for 9<sup>th</sup> graders is only a first step for better understanding how utility of reading influences the development of reading literacy.

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## Appendix

### Utility value of reading items

Table A.1 displays the items of the scale utility value of reading with their respective mean and standard deviation. The items have been translated from German into English. All items in German can be found in Hertel, Hochweber, Mildner, Steinert, and Jude (2014) where the scale is termed *Einstellung zum Lesen* (attitude towards reading). The means and standard deviations displayed refer to the German sample used in this study and are weighted.

*Table A.1:* Items, their means (M) and standard deviations (SD) of the scale utility value of reading.

| Variable  | Item   | M    | SD   |
|-----------|--|------|------|
| STN04aM01 | Reading is important to negotiate one's way in the information society.                    | 3.12 | 0.81 |
| STN04aM02 | Reading helps to pursue own goals.   | 2.89 | 0.83 |
| STN04aM03 | Reading is necessary in order to be able to participate in the societal and cultural life. | 3.01 | 0.86 |
| STN04aM04 | Reading is important for the career.   | 3.23 | 0.80 |
| STN04aM05 | Reading helps to solve everyday problems.  | 2.69 | 0.94 |
| STN04aM06 | Reading enables participation in political discussions.                                    | 2.96 | 0.87 |
| STN04aM07 | Reading enables getting to know different perspectives.                                    | 3.09 | 0.80 |
| STN04aM08 | Reading is necessary to organize one's life.   | 2.58 | 0.97 |
| STN04aM09 | Reading helps to enlarge one's knowledge.  | 3.53 | 0.71 |

### Reading self-concept items

Table A.2 displays the items of the scale self-concept of reading with their respective mean and standard deviation. The items have been translated from German into English. All items in German can be found in Hertel et al. (2014) where the scale is termed *Selbstkonzept für das Verstehen von Texten* (self-concept for understanding texts). The means and standard deviations displayed refer to the German sample used in this study and are weighted.

Table A.2: Items, their means (M) and standard deviations (SD) of the scale reading self-concept.

| Variable  | Item   | M    | SD   |
|-----------|--|------|------|
| STN02aM01 | I am convinced that I can understand very difficult texts.   | 2.86 | 0.77 |
| STN02aM03 | I am convinced that I can handle well even the most complicated texts that the teacher presents in German classes. | 2.76 | 0.76 |
| STN02aM05 | I am convinced that I can master the skills that are necessary for understanding texts.                            | 3.01 | 0.71 |

### Intrinsic task value items

Table A.3 displays the items of the scale self-concept of reading with their respective mean and standard deviation. The English version of the items stems from OECD (2009a) where the scale is termed *reading attitude*. All items in German can be found in Hertel et al. (2014) where the scale is termed *Lesefreude* (joy of reading). The means and standard deviations displayed refer to the German sample used in this study and are weighted.

*Table A.3:* Items, their means (M) and standard deviations (SD) of the scale intrinsic task value.

| Variable | Item   | M    | SD   |
|----------|--|------|------|
| ST24Q01  | I read only if I have to. *                                | 2.19 | 1.14 |
| ST24Q02  | Reading is one of my favourite hobbies. *                  | 2.07 | 1.05 |
| ST24Q03  | I like talking about books with other people               | 2.03 | 1.01 |
| ST24Q04  | I find it hard to finish books.                            | 1.91 | 1.01 |
| ST24Q05  | I feel happy if I receive a book as a present.             | 2.45 | 1.06 |
| ST24Q06  | For me, reading is a waste of time. *                      | 1.97 | 1.08 |
| ST24Q07  | I enjoy going to a bookstore or a library.                 | 2.10 | 1.09 |
| ST24Q08  | I read only to get information that I need. *              | 2.37 | 1.09 |
| ST24Q09  | I cannot sit still and read for more than a few minutes. * | 1.63 | 0.92 |
| ST24Q10  | I like to express my opinions about books I have read.     | 2.66 | 1.04 |
| ST24Q11  | I like to exchange books with my friends.                  | 2.05 | 1.11 |

*Note.* \* Items excluded for the shortened version of the scale because of their potential reference to the frequency of reading.