Ability Self-Concepts and Subjective Value in Literacy: Joint Trajectories From Grades 1 Through 12

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Because literacy skills are critical for most academic subject matters, researchers have become increasingly interested in understanding children’s motivation in this domain as a way to increase academic success. In this study, we extend previous work by looking at the heterogeneity of children’s motivational changes in literacy across Grades 1–12. We used a cross-sequential design based on 3 different cohorts of children (N = 655) coming from 10 public elementary schools. Data were collected over an 8-year period (1988–1996) starting when children were in 1st, 2nd, and 4th grades. Using multiple-process growth mixture modeling, we identified 7 groups of children showing distinct trajectories of change in literacy subjective task value and ability self-concept across school years. For all children, ability self-concept and subjective task value decreased between Grade 1 and Grade 12; however, this decline was more apparent for some youths than for others. Our findings suggest the importance of school-based interventions that aim to prevent decreases in student motivation for literacy over time and that focus on the early detection of children at risk for dramatic declines.

Keywords: ability self-concepts, task value, literacy, motivation, trajectories

In most industrialized societies, literacy skills are essential for daily functioning. Good reading and writing abilities are associated with important life consequences, such as better employment rates and higher socioeconomic status (SES; Guthrie, Schaefer, & Hutchinson, 1991; Madden, Slavin, Karweit, Dolan, & Wasik, 1993; Raudenbush & Kasim, 1998). Because these skills are central to most academic subject matters (Wilson & Trainin, 2007), many youths who do not acquire basic reading and writing abilities become alienated from school, leading to disengagement and eventually to dropout (Janosz, Archambault, Morizot, & Pagani, 2007). In light of such consequences, researchers have become increasingly interested in understanding children’s motivation in literacy as a way to increase their reading comprehension and writing skills (Guthrie, McRae, & Klauda, 2007). In the present study, we investigated how different groups of children change from Grade 1 through Grade 12 along two important components of motivation: subjective task value and ability self-concepts for school-based literacy activities. Moreover, we examined whether specific individual and family characteristics could predict these distinct motivational pathways.

Ability Self-Concept and Subjective Task Value in Literacy

Subjective task value and ability self-concepts represent two widely studied components of literacy motivation (Baker & Wigfield, 1999; Chapman & Tatum, 1995; Durik, Vida, & Eccles, 2006; Eccles, 1984; Guthrie, Wigfield, & VonSecker, 2000; Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002; Wigfield & Eccles, 1994). Ability self-concept refers to children’s own assessment of their skills and capability to perform well in a specific domain, whereas subjective task value is generally defined in terms of child interest, perceived utility, cost, and intrinsic motivation (Chapman & Tatum, 1995; Durik et al., 2006; Eccles et al., 1983; Schunk & Zimmerman, 1997; Wigfield & Guthrie, 1997). Children’s self-perceptions and beliefs have been shown to predict their selection of activities and level of commitment to them (Eccles, 1984; Eccles et al., 1983). Children tend to select classes, participate actively, and achieve well in domains that they enjoy, find important, and believe they can succeed at. Children who enjoy reading and writing generally believe it is important in their everyday life and future and report positive beliefs about their own reading and writing abilities. They also spend more time reading for leisure, choose language arts as elective courses in high school more often, and are more likely to engage in language arts activities (Durik et al., 2006; Guthrie, Wigfield, et al., 2006). In addition, these children show higher involvement in deep texts processing (Schiefele,
Joint Development of Ability Self-Concept and Subjective Task Value

Although children who both feel competent and perceive greater value in reading and writing appear to be at an advantage, longitudinal studies indicate that these beliefs globally diminish as children get older (Durik et al., 2006; Eccles, Wigfield, & Schiefele, 1998; Jacobs et al., 2002; Stipek & Mac Iver, 1989; Wigfield & Eccles, 1994; Wigfield et al., 1997). As suggested by many authors (Higgins & Parsons, 1983; Nicholls & Miller, 1984; Parsons & Ruble, 1977; Stipek, 1984; Wigfield, Eccles, Mac Iver, Reuman, & Midgley, 1991), the nature of this decrease is likely explained, at least in part, by changes children encounter as they grow up. Because children in the early elementary years have a limited experience in age-segregated schools, they tend to be overly optimistic. As such, they may have positive beliefs about their ability to achieve or unrealistic expectations of how interesting school subjects will be. As child cognitive skills develop, school environments change and become more focused on performance and social comparisons (Ames, 1992; Eccles, Lord, & Midgley, 1991; Feldlaufer, Midgley, & Eccles, 1988; Ruble, Boggiano, Feldman, & Lobel, 1980; Stipek & Mac Iver, 1989). As a result, children who are experiencing academic difficulties are likely to develop more nuanced impressions of their own competencies, especially when they compare themselves with peers. Globally, these changes in child perceptions of themselves and others could lead them to feel less competent in a given domain. To protect their more general sense of self-worth, children may then begin to reduce the value that they place on tasks associated with failure (Covington, 1992, 1998; Eccles et al., 1998; Harter, 1982).

The changes operating over time on children’s task value and ability beliefs are neither similar nor independent. Ability self-concept is more likely to remain stable across school years than subjective task value (Durik et al., 2006). Further, both components are part of a whole and need to be integrated to understand children’s motivational experience over time. According to Eccles et al.’s (1983) expectancy-value model, children’s ability self-concepts in a specific domain directly influence their expectations of success and task value in this domain. Therefore, children who feel less competent in literacy should come to value activities in this domain less. They are also likely to spend less time and effort developing their reading and writing skills (Deci & Ryan, 1985; Eccles et al., 1998; Jacobs et al., 2002). Although some studies (Nurmi & Aunola, 2005; Spinath & Spinath, 2005; Spinath & Steinmayr, 2008) have failed to find evidence for these predictions, others have highlighted a relationship between ability self-concepts and subjective task value (Durik et al., 2006; Eccles et al., 1983; Eccles & Wigfield, 1995; Jacobs & Eccles, 2000; Jacobs et al., 2002; Marsh, Trautwein, Ludtke, Koller, & Baumert, 2005; Wigfield & Eccles, 1994). In their research, Jacobs et al. (2002) studied the longitudinal changes of children’s subjective task values for English, math, and sports before and after controlling for ability beliefs. Globally, they found that in every domain, both dimensions of achievement motivation decreased across Grades 1–12. Further, they demonstrated that perception of ability explained around 40% of the decrease in children’s subjective task value in each of these domains. Although task value can have several other sources within individuals or contexts (e.g., perceptions of individual progress, autonomy in the classroom; Assor, Kaplan, & Roth, 2002; Spinath & Steinmayr, 2008), the findings from this study suggest that the changes children experience in terms of their self-concept and beliefs are related and, therefore, ought to be integrated together in studying child development.

Individual Differences in Trajectories of Change

Although there certainly is a group of children who follow a trajectory of change characterized by the same general decline of literacy ability self-concept and subjective task value that is found in the average population, this general pattern is unlikely to represent the reality of every child. Some might maintain more positive and stable subjective task value and ability self-concept over the years, whereas others might report low motivation very early in their academic experience. Unfortunately, we know little about individual and group differences in the development of these two components. In fact, most research on children’s motivation fails to consider simultaneously the multidimensionality of children’s motivation and the nature and course of its development for different groups.

Some research has addressed differences in the way motivational constructs cluster together. A study by Roeser, Eccles, and Sameroff (1998) identified four subgroups of adolescents on the basis of their pattern of academic school and social-emotional functioning in the seventh grade: a positive adjustment group, a poor school value group, a poor mental health group, and a multiple problem group. In the literacy domain, another study by Baker and Wigfield (1999) identified different clusters of fifth- and sixth-grade children on the basis of their reading motivation. They distinguished seven groups characterized by distinct motivational profiles. One third of youths were characterized by high scores on different dimensions of reading motivation (e.g., self-efficacy, importance beliefs, involvement, curiosity), 15% reported low scores, and the remaining half presented mixed profiles (low or high scores on only some dimensions).

Other studies modeled longitudinal patterns of student engagement and motivation in school. For example, a study by Ratelle, Guay, Larose, and Senécal (2004) described the trajectories of different types of school motivation at the time of transition from high school to college. These authors demonstrated that some motivational styles were more stable over the years than others. They also showed that a decrease in motivation was observed after the school transition but only for a small group of students. Similarly, Midgley, Eccles, and their colleagues have shown that the trajectories of change in both ability self-concept and subjective task value for mathematics vary substantially across the junior high school transition depending on student classroom experiences and initial levels of competence (see Eccles, Midgley, et al., 1993, for summary). Finally, Archambault, Janosz, Morizot, and Pagani (2009) identified six groups of students presenting distinct trajectories of behavioral, affective, and cognitive engagement in school.
from 12 to 16 years of age. They showed that although the majority of students presented stable and positive educational pathways across high school, one third of adolescents reported important changes and disconnectedness on multiple facets (behavioral, affective, cognitive) of their school experience over time.

Taken together, these studies highlight the relevance of considering the multidimensionality of children’s motivation when studying development across the whole academic experience. Further, they also point out the importance of distinguishing motivation both for individuals and groups to obtain a more integrated portrait of children’s development (Willett & Sayer, 1996). Building upon this work, in the present study we modeled the joint trajectories of literacy ability self-concept and subjective task value that children follow across Grades 1–12. Unlike prior research that has focused on the average decline characterizing the majority of children, we identified distinct groups following heterogeneous pathways on these two dimensions. Moreover, we examined whether different individual and family characteristics can contribute to predict these trajectories of change over time.

### Predictors of Subjective Task Value and Ability Self-Concept Trajectories

Researchers have identified several individual, familial, social, and academic factors that have contributed to children’s ability self-concepts and subjective task value in reading and writing activities (Deci, Vallerand, Pelletier, & Ryan, 1991; Eccles et al., 1983; Eccles, Wigfield, Harold, & Blumenfeld, 1993; Guthrie, Hoa, Wigfield, Tonks, & Perencevich, 2006; Wigfield & Eccles, 2002). In the present study, we only considered early characteristics related to children or families. Among these characteristics, past history of achievement represents a good predictor of children’s motivational changes (Corpus, McClintic-Gilbert, & Hayenga, 2009; Harter & Connell, 1984; Jacobs et al., 2002; Marsh, Byrnes, & Yeung, 1999; Marsh et al., 2005; Skaalvik & Hagtvet, 1990). Children who achieve well and invest efforts in school would be more likely to receive positive feedback on their abilities and, accordingly, would report more positive perceptions of competencies and greater value of academic tasks over time (Harter & Connell, 1984).

Gender is also an important predictor of children’s motivation changes in literacy-related activities. Although gender differences do not appear in every study (Anderman et al., 2001), over time girls tend to place higher value on literacy activities and, as a result, report higher confidence in their abilities in this domain than boys (Baker & Wigfield, 1999; Durik et al., 2006; Eccles, 1984; Eccles et al., 1989; Jacobs et al., 2002; Marsh, 1989; Wigfield et al., 1991, 1997). Moreover, girls’ advantage on boys regarding their self-concept should increase over time (Durik et al., 2006; Jacobs et al., 2002).

Finally, parents’ perceptions of their children’s abilities and family socioeconomic background have also received considerable attention in the literature (Bradley & Corwyn, 2002; Brooks-Gunn & Duncan, 1997; Chapman & Tumner, 1995; Chapman, Tumner, & Prochnow, 2000; Eccles et al., 1983; Fredricks & Eccles, 2002; Jacobs & Eccles, 1992; Parsons, Adler, & Kaczala, 1982; Rimm-Kaufman, Pianta, Cox, & Bradley, 2003; Wilson & Trainin, 2007). According to Eccles et al.’s (1983) expectancy-value model, when parents report high positive beliefs about their children’s competence in a specific domain, children tend to develop high ability self-concepts in this domain and to achieve better over time. Otherwise, when parents hold negative estimates of their children’s reading/English competencies, children tend to feel less competent in this domain and report lower achievement. Further, combined with the fact that they often are exposed to low quality child care and attend schools with both large concentrations of children with special needs and less resources (e.g., extracurricular activities, professional services), children from low SES families often develop their reading abilities more slowly (Aikens & Barbarin, 2008; Chapman & Tumner, 1995; Chapman et al., 2000; Evans, 2004; Whitehurst & Lonigan, 1998; Yeung, Linver, & Brooks-Gunn, 2002). Over the long run, many experience increased difficulties with academic material because of their limited literacy and may respond to this increased difficulty by disengaging from the academic activities at school (Brooks-Gunn & Duncan, 1997; Duncan & Brooks-Gunn, 1997).

Despite the substantial literature on individual and family predictors of children’s motivational changes over time, we know little about the early role of these predictors on children’s distinct trajectories of change. Hence, on the basis of the natural principle of multifinality, which stipulates that the same characteristic may influence different outcomes over time (Cicchetti & Rogosch, 1996), it is important to consider early factors that predict the distinct motivational pathways that children follow across their whole school experience. As suggested by Spinath and Steinmayr (2008), understanding such factors represents an important step for researchers and practitioners in understanding characteristics that have the potential to buffer children’s motivational decrease. This knowledge will support early prevention programs for children placed at risk of experiencing such declines.

### Goals of the Study

Overall, research highlights that for the majority of children, their ability self-concept and subjective task value tend to decrease over time. Yet, some students present more stable and positive motivation pathways, whereas others report low motivation over time (Archambault et al., 2009; Baker & Wigfield, 1999; Ratelle et al., 2004; Roeser et al., 1998). Further, such declines appear to be influenced by the transaction between individual and environment factors (Sameroff & Fiese, 1990). However, there is a lack of knowledge on how these two components of motivation develop for different groups of children across the whole school experience. Further, despite the substantial literature on individual and family predictors of child motivational changes over time, we know little about the role of early predictors that affect distinct trajectories of change. In this research, we overcome these limitations by studying the heterogeneity of motivational changes in literacy across Grades 1–12. Instead of focusing on the general positive, negative, or declining trajectories found in previous research, we expected to identify more groups of children following distinct trajectories of subjective task value and ability self-concepts. Furthermore, we assess the contribution of early specific individual and family characteristics to explain interindividual differences in the development of these trajectories. By studying the joint development of these motivational dimensions and by identifying factors that predict these trajectories of change, we hope to enrich our understanding of individual development. We
also believe that the results of the present study can help guide the elaboration of specific interventions directed to particular groups of children. Because there are few comparable studies, it is difficult to hypothesize the number or shape of the trajectories that might be expected. Nevertheless, consistent with past research that studied motivation at various ages or for the population average (Archembault et al., 2009; Baker & Wigfield, 1999; Jacobs et al., 2002; Ratelle et al., 2004), we were able to formulate the following hypotheses. First, we predict the existence of at least three trajectories: a high trajectory where children report elevated and stable literacy subjective task value and ability self-concepts over time, a low trajectory where children report low subjective task value in reading and writing activities and negative perception of their abilities from school entry to the end of high school, and a declining trajectory where children report a constant decline on subjective task value and ability self-concepts. In line with the typical normative declines in motivation during adolescence (Jacobs et al., 2002), we predict that this last group will characterize the most children. Second, for theoretical reasons (Deci & Ryan, 1985; Eccles et al., 1983), we also predict that for most children, a decline in their ability self-concept would precede a decline in subjective task value. Finally, we predict that compared with groups of children reporting stable and high competence beliefs and value over time, those following low or decreasing trajectories of ability self-concept and subjective task value will differ in specific ways on early individual and family characteristics that place them at risk. These include being a boy, having a past history of disengagement and underachievement, coming from a low income family, and having parents who hold negative perceptions of their competencies (Eccles et al., 1996).

Method

Sample

This study is part of the Childhood and Beyond Longitudinal Project (Eccles et al., 1983). The sample was composed of 655 children (49.2% boys) who participated in the first year of the study and who presented valid answers on at least three of the five waves of data collection. Children originally came from 10 elementary public schools located in four middle-class communities of a large city in the Midwest. Every child at the appropriate grade level in each school was asked to participate. Of the children, 75%–80% agreed to take part in the study and received parental consent to do so. These children were followed over their elementary, middle, and high school years (for more information about this sample, see Jacobs et al., 2002).

This study used a cross-sequential design based on three different cohorts of children. As showed in Table 1, during the first year of the study, children of the first, second, and third cohorts were in first, second, and fourth grades, respectively. Using such a design, we were able to get information on child subjective literacy value and ability self-concept from Grade 1 to Grade 12. Data for the 11th grade were missing in every cohort. However, these data were not problematic given that our analytic method allowed for the presence of missing data on the repeated measures that were used to build the trajectories.

Measures and Procedures

Data were collected between 1988 and 1996. The assessment took place in the participants’ classrooms during the spring period. During the first three years of data collection, questions were read aloud to the children to foster their understanding. During these waves of data collection, mothers were asked to complete questions about family characteristics and their own perception of her child’s competency in literacy. Finally, teachers were also asked to answer questions regarding their perception of individual child’s abilities and efforts in reading. A 3-year interruption in data collection occurred because of a break in funding. During the next three waves, which took place in junior and senior high school, participants read the questionnaires themselves (for more details, see Jacobs et al., 2002).

Task beliefs. We assessed child literacy beliefs during the five waves of data collection. Comparable wording was used over years; however, to be relevant to what children learned in school, we asked the children in elementary school about their self-beliefs about reading and the children in secondary school about their self-beliefs about English. We assessed Reading/English Ability Self-Concept using five items that measured children’s perception of their abilities in reading (e.g., “Compared to other subjects how good are you at reading?”). We measured Reading/English Subjective Task Value using four items that asked children how important and useful reading/English was to them (i.e., “How useful is what you learn in reading?”). Both scales were answered using 1–7 Likert response scales (e.g., 1 = not useful, 7 = very useful) and showed good internal reliability in all waves (for more details, see Jacobs et al., 2002). To sharpen the comparison of individual changes over time and to ensure that changes in child ability self-concept and value over time are not due to changes in children’s understanding of the questions, we centered scores on these two scales, across cohorts, on the grand mean (the mean of the whole sample for all time points; Bryk & Raudenbush, 1992). At each grade, the grand mean of 5.2230 was subtracted from student scores on ability self-concept, and the grand mean of

\begin{table}[h]
\centering
\caption{Number of Children by Cohort and Grade at Each Year of Data Collection}
\begin{tabular}{|ccc|ccc|}
\hline
\hline
1 (n = 215) & Grade 1 & Grade 2 & Grade 3 & Grade 7 & Grade 9 \\
2 (n = 232) & Grade 2 & Grade 3 & Grade 4 & Grade 8 & Grade 10 \\
3 (n = 208) & Grade 4 & Grade 5 & Grade 6 & Grade 10 & Grade 12 \\
\hline
\end{tabular}
\end{table}
5.0508 was subtracted from student scores on subjective task value. This strategy enabled us to interpret students’ scores on ability self-concept and value in relation to the sample mean.

Covariates at the First Year of Assessment

Children’s gender. Information on gender was obtained from official records. Female participants were coded as 0, and male participants were coded as 1.

Family income. Family income was self-reported by the mother on a 9-point scale (1 = under $10,000 a year, 9 = over $80,000).

Reading/learning efforts and grades. Children’s grades, reading, and learning efforts were reported by teachers on the first year of assessment. Both scales were measured on a 15-point scale (E minus to A plus).

Parental perception of their child’s reading ability. Parental perception of their child’s reading ability was self-reported by the mother at Time 1. This scale comprises five items (α = .94) that assessed maternal perception of their child’s reading competencies (e.g., “How good is your child at reading?”). Parents’ responses were evaluated on a 7-point Likert scale (1 = not at all good, 7 = very good).

Analytic Strategy

Multiple-process growth mixture modeling (GMM; B. O. Muthén, 2001, 2004) was implemented in Mplus to identify subgroups of children following distinct trajectories of literacy subjective task value and ability self-concepts. GMM does not assume that the population of children is homogeneous and can be represented by a single multivariate normal distribution. Rather, GMM assumes that individuals follow heterogeneous, quantitatively and qualitatively distinct trajectories of change (B. O. Muthén, 2001; Nagin, 1999). On the basis of repeated measures, Mplus permits one to estimate simultaneously the change parameters (i.e., intercept and slope) on two different but related outcomes. This kind of joint development model (see L. K. Muthén & Muthén, 2006) allowed us to examine simultaneously the developmental course of children’s subjective task value and ability self-concept from Grade 1 through Grade 12. To identify children’s membership in these joint trajectories, GMM classifies each individual in a probabilistic manner.

Covariates were included in the different models to predict child membership in each trajectory (see B. O. Muthén, 2001, 2004). The relationships identified with the covariates are model-based rather than post hoc estimations. Because Mplus allows missing data in all parts of the GMM except for covariates, missing values on literacy subjective task value and ability self-concept were not problematic. Yet, we used the PATTERN option in Mplus to consider the type of missing data associated with the multiple cohort design. To make the distinction between longitudinal effects and cohort effects, we tested the assumption of invariance of growth parameters across cohorts and found no variations. For the covariates, we imputed missing data (less than 10%) using the NORM multiple imputations program (Schafer, 1999). NORM uses an iterative method based on EM algorithm to impute missing data by drawing values from the conditional distribution of the variables given their observed data (for technical details, see Schafer, 1999). To limit the danger of identifying a local solution that is not the true maximum likelihood, we used the random starts features available in Mplus and tested 500 random starting value sets for all of our models (McLachlan & Peel, 2000).

Finally, we selected the best model on the basis of the convergence of different statistical indices and on substantive arguments (see B. O. Muthén, 2003). We used the log-likelihood ratio (LLR), the Akaïke information criterion (AIC; Akaïke, 1987), the Bayesian information criterion (BIC; Schwarz, 1978), and the sample-size adjusted Bayesian information criterion (ABIC; Sclove, 1987). The smallest absolute values of these indices generally indicate a better fit model. However, it is preferable to rely on the BIC and ABIC rather than the AIC (particularly the ABIC), as these are stricter and usually favor the selection of a more parsimonious model with fewer trajectories (see Kass & Wasserman, 1995). To further secure our decision in selecting the best model, we used the adjusted likelihood ratio test (LMR-LRT; Lo, Mendell, & Rubin, 2001) and the bootstrap likelihood ratio test (BLRT; McLachlan & Peel, 2000). For a given model, a nonsignificant LMR-LRT and BLRT test suggests that a model with one fewer class would provide a better fit. Finally, we also relied on the Entropy Index that summarizes the quality of the classification (Ramaswamy, DeSarbo, Reibstein, & Robinson, 1993) on the basis of pertinent theory.

Results

We estimated the means, correlations, and distribution statistics for the total sample. The standard deviations and distribution statistics (i.e., skewness and kurtosis) were not large for ability self-concept and subjective task value scales, suggesting that the identification of mixture distributions would not be a direct result of severe nonnormal distributions. All correlations were in the expected directions. Further, correlations between the covariates were all small (around .10), suggesting no multicollinearity problem.

We tested up to 10 different models. In all models, an intercept and both linear and quadratic slopes were specified. Time-invariant covariates were also included in the models and allowed to influence latent growth parameters (i.e., intercept and slope) as well as the categorical latent variable (i.e., class membership). The means of these growth factors were the only parameters allowed to vary across classes. Correlations between temporally adjacent residuals measurement variances were also estimated.

On the basis of the different fit statistics (see Table 2), we opted for a seven-class model. Although the information criteria (LLR, AIC, BIC, ABIC) consistently decreased as the number of classes increased, this decrease stabilized at the five-class solution. While testing the BLRT for models from three to 10 classes, results were inconclusive (p < .05 in every model). We thus decided not to rely on this test. Otherwise, the LMR-LRT favored a seven-class model. The Entropy Index of .77 for this model indicated adequate quality of classification (i.e., not too many classification errors). The classification of the final model is presented in Table 3. This classification table is based on the posterior probabilities of being classified in each latent class and suggests that the seven-class model provides an acceptable classification, although two latent classes showed average probabilities slightly lower than .80 diagonally. On the basis of these indicators, but also because this
seven-class solution was theoretically more interesting because it included the Late Decline Trajectory, we opted for this model.

The Course of Children’s Literacy Subjective Task Value and Ability Self-Concept

Figure 1 illustrates the seven trajectories of literacy subjective task value and ability self-concept. This figure presents child mean predicted scores on the two dimensions across Grades 1–12. Overall, contrary to our first hypothesis, none of the groups—neither children in the highest trajectory nor children in the lowest trajectory—reported stable patterns of ability self-concept and subjective task value. Further, this figure illustrates three declining trajectories instead of one, and, in contrast to our second hypothesis, children of all groups except the Moderate trajectory reported similar changes on their ability self-concept and subjective task value over time.

The first group illustrated in Figure 1, the High Trajectory, is composed of children presenting the most positive profile. Of all groups, these children maintained the highest level of literacy subjective task value and ability self-concepts over years. Nonetheless, they showed a small motivational decrease from Grade 1 to Grade 7. This group represents only 10% of the sample, and, unsurprisingly, is composed of a majority of girls (66.7%, adjusted Bayesian information criterion).

In the next group, the Moderate Trajectory (20.3%), student’s motivation fluctuated around the mean. Of all trajectories, it is the only one in which child ability self-concept and subjective task value do not follow similar patterns of changes over time. In the first years of schooling, members of the Moderate Trajectory reported higher literacy subjective task value than ability self-beliefs. Yet, up to Grade 9, their literacy subjective task value decreased consistently, whereas their ability perception remained stable. By the end of 12th grade, both boys and girls (girls = 52.6%, ASR = -0.05) from this group reported mean-level motivation on the two dimensions.

Children in the Transitory Decline group (18.3%) reported the same mean level of ability self-concept and subjective task value in Grade 1. Their motivation decreased until the transition to junior high school when their scores on both scales began to increase. Over all the years, these children, mostly boys (73.3%, ASR = 5.8), maintained higher ability self-concepts than subjective task value.

Students from the three declining trajectories—Early Decline (7.8%), Constant Decline (28.1%), and Late Decline (13.3%) trajectories—all evidenced substantial motivational declines over years. The main difference between these three groups lies in the proportion of boys and girls at the moment when their motivational declines started. Children in the Early Decline and Late Decline trajectories were mostly boys (70.6%, ASR = 3.2; 69.0%, ASR = 3.6, respectively); in contrast, there was a slight majority of girls in the Constant Decline group (57.5%, ASR = -2.2). For the Constant Decline and the Early Decline children, the decrease in ability self-concept and subjective task value began in the second grade. Yet, by the sixth grade, the Early Decliners reported a motivation-level far below the average, whereas the decrease showed by the Constant Decliners was slower. Finally, the Late Decliners followed a similar trend but in later grades. During the transition to secondary school, these children reported high subjective task value and ability self-concept. In the ninth grade, their motivation was still around the average; however, by the 12th grade, their motivation—especially their ability self-concept beliefs—was quite low.

In the last group, the Low Trajectory, children are characterized by weak perception of their reading abilities and low valuing of literacy from the very beginning of school entry. They presented the lowest scores until ninth grade, when their motivation shifted and increased slightly. This Low group represented 2.2% of our sample, mostly boys (63.6%, ASR = 2.6).

Predictors of the Different Trajectories

Membership in each school motivation trajectory was regressed on a series of theoretically meaningful covariates measured in early schooling. Because the dependent variable consists of an unordered categorical latent variable, the log-odds of motivation trajectory membership must be calculated relative to a reference group. Because children in the High Trajectory maintained the highest subjective task value and ability self-concept over all years, we used this group as the reference.

The predictive effects of the covariates are reported as odds ratios (with 95% confidence intervals) in Table 4. These odds ratios represent the change in odds of being in one trajectory compared with the High Trajectory when the value of the predictor increases by one unit. Compared with children from the High group, the odds of being a boy was 2.16–3.31 times higher for children in the Transitory, Early, Late Decline, and Low Trajectory. Compared with children from the High group, the Early, Late, and Constant Decliners were also more likely to live in a lower income family. Further, except for the Late Decliners, youths of all other trajectories earned lower grades in their first years of schooling than the High group. Finally, the odds of having a parent reporting a low perception of his/her child’s reading ability was higher in the Early Decline group.

Discussion

In this study, we assessed the joint development of child ability self-concept and subjective task value in the domain of literacy

Table 2

Summary of Fit Statistics for Different Growth Mixture Models

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<th>ABIC</th>
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<td>8</td>
<td>-9,488</td>
<td>19,259</td>
<td>19,896</td>
<td>19,445</td>
</tr>
<tr>
<td>9</td>
<td>-9,456</td>
<td>19,221</td>
<td>19,911</td>
<td>19,423</td>
</tr>
<tr>
<td>10</td>
<td>-9,303</td>
<td>19,193</td>
<td>19,874</td>
<td>19,397</td>
</tr>
</tbody>
</table>

Note. LLR = log-likelihood ratio; AIC = Akaike information criterion; BIC = Bayesian information criterion; ABIC = sample-size adjusted Bayesian information criterion.
from the beginning of elementary school through the end of high school. We identified seven groups of children with distinct trajectories of change over the school years. We further demonstrated that a confluence of risk factors predicted these different pathways, suggesting that school-based interventions aimed at promoting child motivation beliefs should be concerned with individual differences over development.

Trajectories of Ability Self-Concept and Subjective Task Value

On the basis of research that has examined child and adolescent motivation and engagement patterns over time (Baker & Wigfield, 1999; Jacobs et al., 2002; Janosz et al., 2008), we expected to identify at least three distinct trajectories of literacy beliefs: stable

<table>
<thead>
<tr>
<th>Class</th>
<th>High</th>
<th>Moderate</th>
<th>Transitory decline</th>
<th>Constant decline</th>
<th>Early decline</th>
<th>Late decline</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>.892</td>
<td>.020</td>
<td>.018</td>
<td>.052</td>
<td>.000</td>
<td>.018</td>
<td>.000</td>
</tr>
<tr>
<td>Moderate</td>
<td>.031</td>
<td>.779</td>
<td>.076</td>
<td>.0816</td>
<td>.013</td>
<td>.012</td>
<td>.009</td>
</tr>
<tr>
<td>Transitory decline</td>
<td>.018</td>
<td>.063</td>
<td>.808</td>
<td>.049</td>
<td>.049</td>
<td>.000</td>
<td>.013</td>
</tr>
<tr>
<td>Constant decline</td>
<td>.072</td>
<td>.049</td>
<td>.046</td>
<td>.774</td>
<td>.045</td>
<td>.014</td>
<td>.000</td>
</tr>
<tr>
<td>Early decline</td>
<td>.000</td>
<td>.011</td>
<td>.060</td>
<td>.054</td>
<td>.861</td>
<td>.000</td>
<td>.015</td>
</tr>
<tr>
<td>Late decline</td>
<td>.091</td>
<td>.007</td>
<td>.000</td>
<td>.059</td>
<td>.000</td>
<td>.843</td>
<td>.000</td>
</tr>
<tr>
<td>Low</td>
<td>.000</td>
<td>.019</td>
<td>.045</td>
<td>.000</td>
<td>.038</td>
<td>.000</td>
<td>.899</td>
</tr>
</tbody>
</table>

Figure 1. Mean predicted value and ability self-concept scores by profile.
and high, stable and low, and decreasing. We further assumed that for most children, a decline in competency beliefs would precede a decline in subjective task value. Overall, these hypotheses were partially supported. However, contrary to expectations, we found much more between-child variation than expected in both competence beliefs and value of literacy. Moreover, of all the groups identified in this study, we found three groups in which child motivation declined from Grade 1 to Grade 12 and none in which children maintained stable beliefs across grades.

Most research on group differences in the development of engagement and motivation have identified youths presenting positive and stable attitudes over time. Consistent with those findings (Archambault et al., 2009; Janosz et al., 2008; Ratelle et al., 2004), we identified by the end of 12th grade a High Trajectory group in which students reported high competency beliefs about reading and English and positive task value about the usefulness and importance of this domain for their future. Unlike those in the general population (Jacobs et al., 2002), these children’s scores were relatively stable over years.

Researchers have suggested two different but related explanations for this observed small motivational decline in highly motivated children. For one, classroom changes in terms of increased control by teachers, social comparisons between peers, and focus on individual differences in performance become more salient in later elementary school (Deci, Ryan, & Williams, 1996; Eccles, Wigfield, Middly, et al., 1993). Second, changes in child cognitive ability makes social comparison more common. As a result, children are likely to become less motivated in domains in which they feel less competent (Harter, 1992; Ruble et al., 1980; Stipek & Mac Iver, 1989). Both of these age-related changes can result in motivated children becoming more aware of themselves and others, which in turn can lead them to process and evaluate the feedback they receive differently. At school entry, most children like school, participate in activities, and feel competent in the academic tasks they initiate. During this time, the focus in the classroom is more on task mastery than on relative performance (Freedman-Doan et al., 2000; Patrick, Mantzicopoulos, Samarakungavan, & French, 2008). However, as they get older and are confronted with an increasing number of academic activities, a greater focus on relative performance levels, and a sharp increase in testing, children begin to develop a better sense of which activities they do or do not enjoy. Hence, they become better able to provide sensitive and objective evaluations of themselves, their interests, and their abilities in different domains. For children from the High Trajectory, these new insights only lead to a relative decline in their competency beliefs and the value they attach to their school subjects. However, this is not the case for most of the children: 90% of our children experienced substantial declines in their literacy motivation across their primary and secondary school years.

Children in declining trajectories evidenced the sharpest drop in motivation. As expected, such pathways represented half the children in our sample. In the Early, Constant, and Late Decline trajectories, children evidenced motivation decreases, but the rate of this decline varied across the school years. All of these children started their first grade year with high motivational beliefs. Most reported that reading was useful for them and that believed they were good at it. Yet, over time, their beliefs about reading became more negative. This decline is particularly worrisome for Early

<table>
<thead>
<tr>
<th>Time 1 predictor</th>
<th>High versus</th>
<th>Gender (boys)</th>
<th>OR 95% CI</th>
<th>OR 95% CI</th>
<th>OR 95% CI</th>
<th>OR 95% CI</th>
<th>OR 95% CI</th>
<th>OR 95% CI</th>
<th>OR 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family income</td>
<td>0.86</td>
<td>[0.68, 1.12]</td>
<td>1.01</td>
<td>[0.85, 1.20]</td>
<td>1.00</td>
<td>[0.83, 1.20]</td>
<td>1.00</td>
<td>[0.82, 1.21]</td>
<td>1.00</td>
</tr>
<tr>
<td>Reading grades</td>
<td>0.97</td>
<td>[0.79, 1.20]</td>
<td>0.98</td>
<td>[0.80, 1.20]</td>
<td>1.07</td>
<td>[0.86, 1.32]</td>
<td>1.07</td>
<td>[0.86, 1.33]</td>
<td>1.07</td>
</tr>
<tr>
<td>Reading ability</td>
<td>0.61</td>
<td>[0.42, 0.85]</td>
<td>0.61</td>
<td>[0.42, 0.85]</td>
<td>0.61</td>
<td>[0.42, 0.85]</td>
<td>0.61</td>
<td>[0.42, 0.85]</td>
<td>0.61</td>
</tr>
</tbody>
</table>

Note: All covariates are significant predictors based on the chi-square test from the total model. The reference group is the high trajectory. OR = odds ratio.
Decliners and Constant Decliners because the changes that they experienced began in early schooling. This premature loss of confidence and decrease in their valuing of literacy are detrimental for sustaining engagement in learning. For this group, in the domain of reading and writing there is a risk of this trend becoming firmly embedded and thus difficult to change. As they disengage from learning, the likelihood that they will acquire the basic reading and writing requirements necessary to succeed in other school subjects is also likely to decline, which in turn may lead to an increase in both their rate of disengagement from school and the likelihood that they will eventually drop out of school before graduating (Jansz et al., 2008). Although we did not investigate the consequences associated with being on these declining trajectories in this article, we hope to do so in the future.

We also identified groups of children who reported both a decrease and an increase of ability self-concept and subjective task value at different time periods of their academic experience. Consistent with our expectations, we identified a Low Trajectory group in which children reported low motivational beliefs from their early grades. Yet, unexpectedly, the motivational profile of these children was not stable. It decreased up to the end of elementary school and then went back to its initial level. A similar pattern was observed in the Transitory Decline group. The perceptions of children from this group changed dramatically in eighth grade: From that point, they felt increasingly better about their ability in reading and writing and assigned growing importance to these tasks. This change likely reflects either individual changes or contextual changes in their experiences in English classrooms. In American schooling, students experience transition to high school at this time, and curriculum shifts from a focus on reading and writing to a focus on literature. Perhaps these changes helped spark the interest of a subset of our participants. These two trajectories highlight the importance of investigating the circumstances under which adolescents can experience motivational increases as they move into secondary school. A better understanding of these circumstances could enhance our ability to design effective intervention strategies for children with early signs of low literacy motivation. Such work would also contribute to our understanding of the interpersonal and contextual processes underlying developmental shifts in child motivation.

Relations Between Ability Self-Concept and Subjective Task Value Over Time

In most trajectories, children reported parallel changes in their feeling of competence and value of reading and writing activities. Such results were quite surprising. However, they are consistent with theories proposing that child ability self-concept in a specific domain directly influences the value given to tasks related to this domain (Deci & Ryan, 1985; Eccles et al., 1983). Actually, the fact that both dimensions vary conjointly in most trajectories does not allow us to disentangle the specific effect of one component on the other. The changes found on subjective task value could be influenced by changes on ability self-concept (and vice versa) or by a third variable such as perception of individual progress (Spinath & Steinmayr, 2008). More research is needed to sort out the effect that each component has on the other in the development of specific trajectory of changes.

Children in one group did evidence noticeable differences between their ratings for subjective task value and ability self-concept in literacy. In their first years of schooling, children from this Moderate Trajectory reported lower ability self-concept than subjective task value. Over time, the importance and usefulness that they assigned to reading and writing decreased steadily, whereas their competency beliefs ratings were stable. Around eighth grade, the two dimensions converged. The early gap that existed between the two dimensions in this group suggests that some young children acknowledge the value of reading even though they do not have great confidence in the reading ability. Such children may evaluate their abilities with reference to the ability of peers over time, or they may fail to achieve as well as they hoped in reading. As a result, these students may begin to feel less competent and gradually reduce the importance that they attach to literacy. According to Wigfield and Eccles (1994), such disengagement could act as a protective mechanism used by children to preserve their self-esteem. To prevent such disaffection, it is important that teachers and practitioners adapt learning activities to challenges and support student valuing of reading and competency beliefs.

Predictors Associated With Trajectories of Change

Our findings also highlight important individual and family predictors associated with child motivational trajectories. Unsurprisingly, we demonstrated that student gender and early academic difficulties remained strong predictors of motivational pathways. Consistent with previous studies (Baker & Wigfield, 1999; Durik et al., 2006), we found a higher proportion of girls in the High Trajectory, in which children maintained the highest and most stable literacy value and ability self-concepts over time. Conversely, the proportion of boys was significantly higher in groups evidencing a motivational decline, especially during the elementary school years. Moreover, children who reported a decline in their competencies beliefs over years demonstrated lower levels of academic achievement than children who maintained high beliefs about literacy from early grades on. However, such findings need to be interpreted while keeping in mind that the relationship between achievement and motivation is reciprocal (Corpus et al., 2009; Marsh et al., 1999, 2005; Nurmi & Aunola, 2005). Therefore, the greater motivational decrease observed among low achievers might be explained by their motivation prior to the study instead of by their early achievement.

Children evidencing declines in their literacy motivation were also more likely to live in low SES families than children who maintained high levels of ability self-concepts and subjective task values for reading (Brooks-Gunn & Duncan, 1997). Even though these children start school with reasonably high ability self-concepts and attach considerable importance to reading, these children are less likely to feel competent about their ability to master reading. One explanation being that disadvantaged families may be less well equipped to intervene and help children catch up in their reading competence. Consequently, children from lower income families are likely to reduce the importance that they attach to these skills to preserve their self-esteem and to continue having greater academic difficulties than children from more wealthy families.
Finally, our finding that parental beliefs were more positive for children showing the earliest motivational decline and presenting the greatest number of family risk factors than parental beliefs for children evidencing the highest motivational level was quite unexpected. According to Eccles et al. (1983), parental perception of child ability should influence the development of their child beliefs—children whose parents hold high estimates of their reading ability should develop high reading ability self-concepts. Evidence, in general, supports this prediction at the population level. One potential explanation for our results might be that parents of the high risk group of children are less educated and acquainted with the demands of the educational system. Therefore, they might have an unrealistic perception of their child’s actual difficulties and abilities. If so, this would further exacerbate the dynamics noted previously: If these parents are not aware that their child needs help in learning to read, they will not be motivated to seek out the supplementary assistance that their child might need. Our results do not allow us to go such in depth in our conclusions, but more research could help clarify this idea and improve our understanding of the family role on children’s motivation over time.

Implications

This study has several implications for research and practice. First, although some practices used by teachers in many upper elementary and secondary schools have been criticized for their harmful consequences on student motivation (Brophy & Evertson, 1978; Midgley, Feldlauer, & Eccles, 1988), the practices used with early elementary school children have received less attention. Considering that 10% of the children in our study reported relatively low reading ability and task value by the third grade, and that nearly one third reported similarly low self- and task beliefs by the end of elementary school situation, it is important to identify how the practices used by elementary school teachers can influence these patterns. This knowledge could help researchers and professionals in the development of effective strategies promoting children’s self-concept of ability and value of literacy.

This study also brings new light on the heterogeneity that exists in the development of literacy-related beliefs. Although the vast majority of children evidence motivational declines as they pass through primary and secondary school, the extent and timing of such changes vary between individuals. It remains unclear whether these differences reflect specific factors that operate at different points in time for different children and what these factors might be. Moreover, there is certainly a need to understand how children in the most problematic declining groups compare with each other and whether characteristics measured later in the academic experience could influence the nature and course of their motivation. However, what is clear is that prevention and intervention efforts need to be developed with these individual differences in mind. A strategy designed for children who already evidence low motivational beliefs in the first grade might not be appropriate for adolescents whose motivational beliefs decline as they move into secondary school. Further, different types of interventions might be needed depending on whether parents view their child’s ability as unrealistically high or realistically low. Finally, different interventions may be needed for boys and girls. For example, as boys spent less time reading for pleasure (Baker & Wigfield, 1999; Coles & Christine, 2002), the kind of books teachers propose may need to be adapted to better stimulate their interest. An important challenge is to bring about changes in curriculum and the daily practices of teachers that are likely to help them respond to the differential needs of students.

Limitations

This study has several limitations that are worth mentioning. First, the sample was composed primarily of children coming from middle-class European American families. Thus, our findings cannot be generalized to other populations. Future work should address this limit and study the development of children’s literacy ability self-concept and subjective task value with more diverse populations of children. A second limitation concerns the factors that were included in our model to predict trajectory membership. Because GMM models only allow the inclusion of a limited number of factors, we selected only a restricted subset of individual and family-related characteristics as covariates. Although those characteristics have been shown to influence child motivation, we omitted some individual (e.g., classroom attention and behaviors), family (e.g., number of books available at home, parental investment in school), teacher (e.g., teacher–student relationships, teacher practices), and school (e.g., school neighborhood, children classroom ratio) characteristics that could have been related to child motivation trajectories. Finally, the characteristics that we selected were only assessed once at school entry. Therefore, we were not able to determine whether these characteristics were stable and whether changes could have influenced child motivation variations over time.

Conclusions

By assessing different trajectories of ability self-concept and subjective task value in the literacy domain, this study demonstrates that children do not all evidence the same trajectories of change over time in their motivational beliefs. Because literacy skills represent the performance standard for most academic subject matters, findings from this research highlight the necessity of investing financial resources for screening children who present early risks of following negative literacy motivational pathways over time (namely boys), who come from low SES families, and who present reading difficulties and important motivational declines in the first two years of schooling. These children should be the targets for interventions that promote intrinsic motivation and competence for reading while they still perceive themselves as having good abilities and believe reading and writing is important.

References


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