

Changes to Pupils' Competence Beliefs in Visual Arts in Lower Secondary Education: A Longitudinal Perspective

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Abstract

The present study examined the changes to pupils' competence beliefs in the subject Visual Arts over three years of lower secondary education in a sample of 752 elementary school pupils in Zagreb, the capital of Croatia. Using a single item 'How good are you in Visual arts?', pupils' competence beliefs were measured three times, at the end of school year in the 5th, 6th and 7th grades. Unconditional latent growth curve modelling (LGCM) revealed high initial values of competence beliefs and a significant but moderate decline over time. Inter-individual variability was observed for both intercept and slope. Growth trajectories of pupils' competence beliefs for girls and boys suggest common developmental trends for both groups, but indicate somewhat lower initial values and greater variability of intercept for boys. Conditional LGCM revealed significant effects of pupils' final subject grades in the 5th grade on both intercept and slope, indicating that pupils who had higher final grades in Visual Arts also had higher initial competence beliefs and that these beliefs changed less over time. The effect of the subjective value of Visual Arts (utility value, intrinsic value, difficulty) on competence beliefs was found only for intercept. These predictors did not have effects on the rate of decline in competence beliefs over time.

Key words: *pupils' competence beliefs; Visual Arts; subjective task value; longitudinal study; lower secondary education.*

Introduction

In the highly contested field of importance of educational subjects, which often causes social and political controversies, the importance of Visual Arts as an academic subject is somewhat undermined. In comparison with STEM subjects or native and

foreign languages, Visual Arts, as well as Music Education, is often overlooked by policy makers and the wider professional community. This is particularly the case in Croatia, where this subject is taught as a compulsory subject in all grades of a single-structure 8-year elementary education system (primary and lower secondary education). Teaching hours for this subject amount to a single hour per week (35 teaching hours per year). The nominal amount of teaching hours is in stark contrast with the nature of the subject itself, largely envisaged as a practical, skill-based, creative domain important for nurturing pupils' interests and talents in the visual arts field. The status of the subject, as expressed through its small presence in pupils' education, might be reflected in pupils' perspectives towards Visual Arts. Various studies have demonstrated the importance of the role of pupils' perspectives on attainment and in the consistency and quality of their classroom work (Jokić, 2013). Research examining pupils' perspectives about subjects is important in order to comprehend their experience of the educational process because this understanding can be used to improve the teaching and learning context. In the present paper, pupils' perspectives are measured through their competence beliefs and attitudes (subjective task values) towards Visual Arts.

In Croatia, there has not yet been any research examining pupils' competence beliefs in Arts Education. In contrast to cases such as Mathematics, such research endeavours are similarly rare in the international context. Previous research examining pupils' attitudes has suggested that pupils perceived Visual Arts as an undemanding subject that is relatively easy to understand and/or learn (Marušić, 2003). Of all subjects that are taught at lower secondary level, Visual Arts is ranked somewhere in the middle with respect to pupils' interest level, but was perceived as the least useful subject for pupils' present life and the least relevant subject for the future. However, pupils appreciated that the subject was easy and did not require the exertion of much effort. Furthermore, 8.2% of pupils identified Visual Arts as the most favourable subject (Marušić, 2003). Based on these results, we hypothesised that pupils' competence beliefs would be high in Visual Arts. However, we wished to explore if and how these beliefs change over the course of lower secondary education.

The Development of Pupils' Competence Beliefs

Pupils' competence beliefs are one of the most prominent constructs in the field of achievement motivation. In an expectancy-value model developed by Eccles and colleagues, competence beliefs (in earlier work this construct has also been called ability beliefs) are defined as pupils' perception of their current competences in a given domain, a concept theoretically distinct to expectancy for success (Wigfield & Eccles, 2000). However, the empirical work of Eccles and colleagues (e.g. Eccles et al., 1993; Eccles & Wigfield, 1995) has indicated these two concepts are practically indistinguishable because children and adolescents do not separate their perception of present competences from their expectations of success in future situations. Nevertheless, competence beliefs

have a crucial role in the expectancy-value model, because these beliefs, together with subjective task value, are assumed to directly influence pupils' academic choices, effort, persistence and achievement (Eccles at al., 1983). Other motivational theories have also assumed competence beliefs to play a key role. In Bandura's (1977) theory, self-efficacy beliefs present a central concept similar to expectation for success. Self-efficacy beliefs are defined as the beliefs about one's capacities to accomplish tasks and succeed in activities (Bandura, 1986). However, Bandura's self-efficacy beliefs were measured mostly at the task-specific level and focus on pupils' beliefs about their confidence to succeed in a certain task, while measures of competence beliefs usually examine individual perspectives at the level of subject domains with the following question "how good are you at/in..." (Wigfield & Eccles, 2000).

Previous research investigating the development of children's competence-expectancy beliefs has indicated that pupils' competence beliefs are domain specific (Wigfield & Eccles, 2000). Children as young as six years of age hold differentiated competence beliefs across different domains (Wigfield & Cambria, 2010). Several cross-sectional studies examining mean-level change in different domains demonstrated a decline in pupils' competence beliefs over the elementary school years and indicated these often continue into subsequent educational levels, at least through early adolescence (Wigfield, 1994). Declines in competence beliefs are particularly evident during the transition to lower secondary level (Schunk & Meece, 2006). Some longitudinal research has also confirmed that children have more positive competence beliefs at a younger age (e.g. Wigfield & Eccles, 1994).

In general, there are two lines of thought in the explanation of the negative changes observed in pupils' competence beliefs across childhood and adolescence (Wigfield & Eccles, 2000). In one opinion, it is believed that the less positive perceptions of competences among older children are attributable to their advanced metacognitive understanding of learning tasks and themselves as learners. Older pupils process evaluative feedback received at schools more accurately and are better able to use information gained from social comparison with their peers in academic contexts. Furthermore, pupils' accumulated experiences of mastery and failure within different domains and with different tasks probably provide the most important source of information for the formation of achievement-related self-image (Usher & Pajares, 2008). When pupils perceive that they are performing well and that their estimates of task/domain difficulty are favourable, their competence beliefs are enhanced. In contrast, in contexts in which tasks are becoming increasingly difficult and pupils begin to receive lower grades, these competence beliefs decline. As a result of all these processes acting together, competence beliefs become more realistic and less positive as pupils progress through elementary and secondary education levels. A second line of thought proposes that observed declines in pupils' competence beliefs are connected to changes in school environments and the teaching and learning practices employed at higher educational levels. Arguably, the decline of competence beliefs among older children and adolescents is related to the

more competitive, more evaluative and less pupil-centred approaches typically present at secondary education levels in comparison to primary levels, as well as to the stress associated with major transitions within the education system.

Most studies examining competence beliefs have been conducted in academic domains such as Maths, Science or English and have used cross-sectional designs to examine normative changes in pupils' competence beliefs over time (e.g. Freiberger et al., 2012). In this study, we have used a longitudinal design not only to examine mean changes over time but also to describe the shape of growth trajectories and to capture individual variations in this change. The present study was conducted at three time points during lower secondary education: at the end of 5th, 6th and 7th grades. These time points were purposefully selected to match the period following the transition from primary to lower secondary education, when change in pupils' competence beliefs is assumed to occur. In contrast to previous studies, we have examined the subject domain that rarely attracts the attention of educational researchers in Croatian and international contexts: the domain of Visual Arts.

Gender Differences in Competence Beliefs

In the present paper, an exploration of differences in patterns of change among girls and boys was also included with the aim to examine gender differences in pupils' trajectories of competence beliefs in Visual Arts. Previous studies examining gender differences in competence reveal inconsistent results (Schunk & Meece, 2006). A meta-analysis of 197 studies examining gender differences in academic self-efficacy identified a small difference favouring males and concluded that content domain moderated effect size variation (Huang, 2013). A number of previous studies indicated that pupils' beliefs tend to follow gender stereotypic patterns, where boys hold more positive competence beliefs in "male" domains such as math or sport, and girls in more "female" domains such as languages and music (Wigfield & Cambria, 2010). There is, however, little evidence for gender differences among younger children (Schunk & Pajares, 2002). Furthermore, gender differences might disappear when previous achievement is controlled and when pupils receive clear performance feedback about their learning progression and results (Schunk & Pajares, 2002).

The Relationship between Competence Beliefs and Subjective Task Values

In an expectancy-value model, subjective task value represents another key determinant of achievement motivation and behaviour. Eccles and colleagues (1983) identify the following components of subjective task (domain) value: attainment value (importance of doing well on a given task), intrinsic value, utility value and costs. Intrinsic value represents subjective interest in the domain and the enjoyment a pupil gains from doing the task and, as such, is similar to the concept of intrinsic motivation (Deci & Ryan, 1985). Utility value represents a pupil's evaluation of the usefulness of the task

or domain (e.g. whether completing a task will lead to the achievement of a desired end state) and is parallel to Deci and Ryan's (1985) concept of extrinsic motivation. Costs include pupils' estimations of potential "sacrifices" related to engagement with the task as well an assessment of the anticipated effort one will need to put into task completion based on the perception of task difficulty and evaluation of one's own personal capacities.

Research indicates that pupils clearly distinguish between competence beliefs and subjective task values and that they form distinct beliefs about what they are good at and what they value in different subject domains, from the first grades of elementary education and onwards (Wigfield, 1994). Children's competence beliefs and task values are positively related and this relationship strengthens as pupils progress through education (Wigfield, 1994; Wigfield & Cambria, 2010). While it is not possible to determine the direction of this effect (i.e. whether competence beliefs influence evaluation of task value or whether subjective task value contributes to the estimation of one's competence in a given task) based on correlational research, research using a modelling approach has suggested that it is more likely that competence beliefs drive pupils' values in a way that pupils come to value tasks in which they feel competent (Wigfield & Cambria, 2010).

In the present study, measures of the intrinsic value, utility value and costs of Visual Arts, expressed as the perceived level of subject difficulty, were included in the model as potential predictors to determine if they could explain individual differences in changes in pupils' competence beliefs over time. We were interested in exploring whether higher interest and utility value for the subject, as well as lower ratings of subject difficulty, were predictive of higher values of competence beliefs over time. Data regarding pupils' achievement in the subject at the beginning of lower secondary education was also included due to its' expected relevance for explaining initial levels and change in pupils' competence beliefs.

Overall, the purpose of the present study is to explore the trajectory of pupils' competence beliefs in Visual Arts over three years of lower secondary education.

More specifically, the present paper aims to answer the following research questions:

- 1 How do pupils' competence beliefs in Visual Arts change over the course of lower secondary education?
- 2 In what manner do the trajectories of pupils' competence beliefs differ among girls and boys?
- 3 To what extent does the subjective domain value of Visual Arts and pupils' achievement in the subject explain variability in changes in competence beliefs?

Method

This paper presents the results of a study that is part of a longitudinal research project examining the nature and determinants of elementary school pupils' educational aspirations. Using questionnaires administered at the end of the school year, this project followed the same generation from the 2016/17 academic year onwards for a

period of three years. The longitudinal character of the research design with the same group of participants allowed for the examination of trajectories in pupils' competence beliefs over time.

Participants

The research was carried out in 23 elementary schools in the City of Zagreb, Croatia, representing a sample of 21.9% of all public elementary schools in the area. The selected schools constituted a random sample stratified by school location. The same pupils participated in three research waves over three academic years: at the end of 5th grade, at the end of 6th grade and at the end of 7th grade. The period between data collection points was approximately 1 year, so the equal distance between time points was preserved. Pupils also participated in an earlier research wave in the middle of the 5th grade, where data related to predictor variables were collected.

At the beginning of the research project, at least two classes were randomly selected in each school and all students from these classes were invited to participate. Parents of all pupils participating in the surveys provided informed written consent prior to administration of the questionnaires. Altogether, 1013 pupils participated in the first data collection point (at the end of the 5th grade), 1032 in the second (at the end of the 6th grade), and 885 in the third data collection point at the end of the 7th grade. In total, 752 pupils participated in the three data collection points relevant for collecting data about the development of competence beliefs. Of these, 684 pupils also participated in the research wave at the midpoint of the 5th grade. The responses of these pupils are included in the statistical analyses presented in this paper.

The attrition of participants over the course of the three data collection waves was expected due to the long time span of the research and changes to teaching methods from classroom to online due to school closures induced by the COVID-19 pandemic in 2020. The proportion of pupils participating in all three end-of-school-year waves represented 74.2% of the number of pupils participating in the survey at the end of the 5th grade. Although these attrition figures might be perceived as substantial, analysis indicated that attrition was not related to variables relevant for the subject of measurement, i.e. was not related to pupils' school achievement in the Visual Arts nor gender.

Measures and Procedures

The trajectories of pupils' competence beliefs in Visual Arts was investigated over the course of three years of lower secondary education (end of 5th, 6th and 7th grades). Pupil questionnaires were administered at schools during class time by researchers. In the final wave, the questionnaire was applied online via the Gizmo Survey platform due to COVID-19 pandemic and school closures. This was conducted in co-operation with participating schools, where links to the survey were sent to all participating pupils via e-mail or the online platforms used by schools during the lockdown period.

The questionnaires consisted of several items that were repeated at all time-points, with a number of additional items added at each time-point.

For the purposes of the present paper, the following parts of the questionnaires were of interest:

Competence beliefs in Visual Arts - measured at the end of the 5th, 6th and 7th grades.

Pupils' competence beliefs for the subject of Visual Arts were measured using a single item:

How good are you in Visual Arts? Please make your rating irrespective of the grades that you currently have in this subject.

Possible responses were given on a 5-point scale: 1 – *Not at all*, 2 – *Slightly*, 3 – *Moderately*, 4 – *Very* and 5 – *Extremely*.

Subjective value of Visual Arts - measured in the middle of 5th grade.

Using three items, pupils were asked to evaluate three elements pertaining to the subjective value of Visual Arts: utility value (*How useful is the subject of Visual Arts to you?*), intrinsic value (*How interesting is the subject of Visual Arts to you?*) and cost expressed as subject difficulty (*How difficult is the subject of Visual Arts for you?*).

Possible responses were: 1 – *Not at all*, 2 – *Slightly*, 3 – *Moderately*, 4 – *Very* and 5 – *Extremely*.

Pupils' expected final grade in Visual Arts - measured at the end of the 5th grade.

Pupils were asked to express their expectations in regards to their achievement in Visual Arts by estimating their expected final grade in Visual Arts at the end of the 5th grade.

In the Croatian education system, final grades range from 1 (insufficient or a failing grade) to 5 (*excellent*).

Gender

The sample consisted of nearly equal numbers of male (49.2%) and female (50.8%) pupils.

Analytical Procedures

Changes in pupils' competence beliefs in Visual Arts over three years of lower secondary education were analysed using latent growth curve modelling (LGCM) within the structural equation modelling (SEM) framework (for further description of LGCM and its applications see: Duncan & Duncan, 2009; Curran et al., 2010; Byrne, 2013; Wang & Wang, 2019). This analytical technique for longitudinal data was chosen based on our intention to describe trajectories of pupils' competence beliefs over time, but also to determine individual factors that might explain the observed patterns of change. Traditional approaches, such as repeated ANOVAs, were deemed inappropriate as they only provide information about mean change and could not capture inter-individual differences in intra-individual change because these methods treat individual differences as error variances (Duncan & Duncan, 2009). In contrast, LGCM allows for the estimation of inter-individual variability in intra-individual patterns of change over time, while at the same is characterised with higher statistical power and great

flexibility in terms of inclusion of partially missing data, non-normally distributed data and categorical data (Curran et al., 2010).

At first, a simple, unconditional LGCM was applied to explain the growth trajectory of pupils' competence beliefs based on observed repeated measures. These measures are treated as multiple indicators of two latent growth variables: intercept and slope (Wang & Wang, 2019). The means and the variances of intercept and slope are the key modelling results that provide information for description of the latent growth curve. The intercept represents the starting point (baseline level/ initial status) of the growth curve, while the slope represents the rate of change over time. The *mean of the intercept* determines the average value of baseline. If significant, it means that the intercept is different from zero. In our case, the mean of the intercept is the value of the competence belief in Visual Arts at the end of the 5th grade. The *variance of the intercept* presents individual differences at baseline level (variation of individual intercepts) and indicates the extent to which pupils differed in their latent scores of competence belief at baseline level. If significant, the variance of the intercept indicates that there is a certain amount of variability in the latent score at baseline. The *mean of the slope* represents the average rate of change in the sample over time. If significant, this mean indicates that there is a change at the group level. The *variance of the slope* provides information about inter-individual differences in change over time (intra-individual change). It provides information about whether the rate of change varied across individuals within the sample. A significant variance of the slope means that participants differed in the rate of change and that some individual growth curves are steeper than others.

In addition to describing growth curves and demonstrating the manner in which pupils' competence beliefs change over time, LGCM also allows us to address questions concerning the role of external variables in this change. Our simple model was extended by including predictors (covariates) of growth that might explain why pupils differ in their initial levels of competence beliefs and in their rate of change. Latent growth curve models that include predictors are called conditional LGCM. While predictors might be time-invariant or time-varying, we included only time-invariant predictors in our model. These predictors are treated as causes of growth in the model because they are measured at the time point preceding the measurement of pupils' competence beliefs.

For the purposes of the present paper, LGCM was performed using the Mplus software, Version 8.4 and employs maximum likelihood estimators (as defaults for continuous data), based on the instruction presented in Muthén and Muthén (2017), as well as in Geiser (2012), Kelloway (2014) and Wang and Wang (2019).

Results and Discussion

The first part of Results section describes unconditional LGCM (i.e. a model without covariates) that was fit to the data in order to assess the growth trajectory of pupils' competence beliefs in Visual Arts over the course of lower secondary education.

First, an unconditional model was specified for the whole sample of pupils (single-group LGCM). Secondly, multiple-group LGCM was applied to establish the growth trajectories of competence beliefs in Visual Arts across two gender groups.

The second part of Results section presents conditional LGCM in which a number of covariates were added to the model in order to examine the effects of these external variables on changes in pupils' competence beliefs in Visual Arts over time. Latent growth variables of intercept and slope were regressed on four time invariant predictors measured at the midpoint or end of the 5th grade: subjective domain value of Visual Arts (intrinsic value, utility value and costs expressed as perceived level of difficulty) and pupils' subject grades.

Unconditional LGCM of Pupils' Competence Beliefs in Visual Arts

Single group LGCM: How do pupils' competence beliefs in Visual Arts change over the course of lower secondary education?

In Figure 1, the mean values and error bars of the observed measures of pupils' competence beliefs in Visual Arts are depicted. Table 1 numerically presents the same values (means and variances) of these repeated measures.

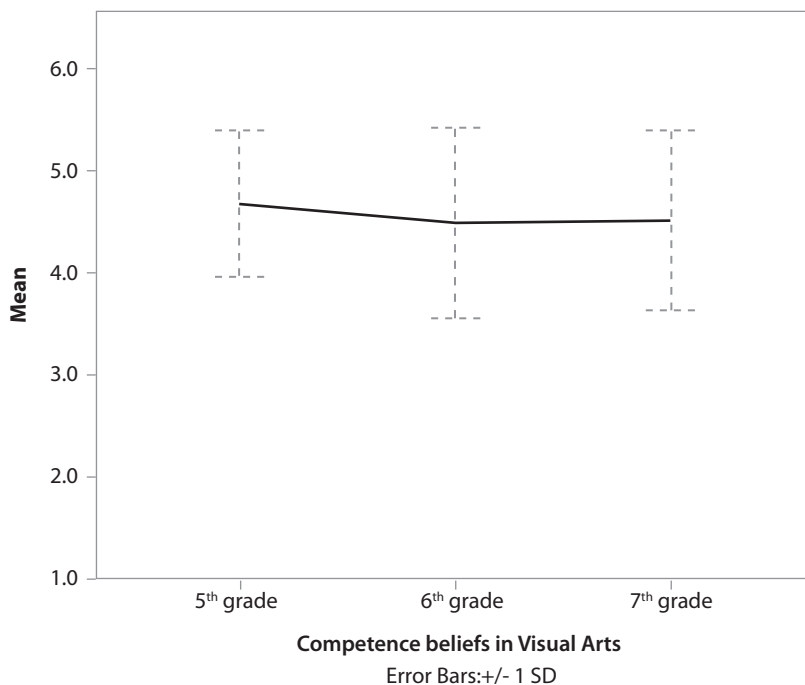


Figure 1. Observed mean values and error bars of pupils' competence beliefs in Visual Arts, measured at the end of the 5th, 6th and 7th grades

Table 1.
Observed repeated measures of pupils' competence beliefs in Visual Arts: Means and variances

PUPIL GROUP	Mean	Variance
5 th grade	4.67	0.514
6 th grade	4.49	0.861
7 th grade	4.49	0.786

The results indicate that, throughout lower secondary education, the mean values of pupils' competence beliefs were very high. The highest means were present at baseline, i.e. at the end of the 5th grade, indicating that, on average, pupils at that point declared that they were very good at Visual Arts. The mean values of pupils' competence beliefs declined slightly at the end of the 6th and 7th grades. This change over time was further analysed using LGCM. The observed values of pupils' competence beliefs in Visual Arts were specified as unconditional LGCM with two latent variables: intercept (initial level) and slope (the rate of change over time). Because the model was based on only three data collection points, we only conducted a test of a linear model to examine fit for the observed data patterns.

A description of the specified linear growth curve model of pupils' competence beliefs is provided through the presentation of the means and variances of intercept and slope in Table 2.

Table 2.
The means and variances of latent growth variables: Intercept and slope of pupils' competence beliefs in Visual Arts

ALL PUPILS		Intercept	Slope
Mean	Estimate	4.65**	-0.10**
	S.E.	0.02	0.02
Variance	Estimate	0.31**	0.05*
	S.E.	0.04	0.02
Correlation Intercept with Slope		-0.27	

**p<.01 *p<.05

In regard to model fit, goodness-of-fit indices were the following: $\chi^2(1)=10.325$, $p<.01$; RMSEA=.087; CFI=.975; TLI=.924; SRMR=.024¹. A Chi square test of model fit was significant (probably due to the large sample size, as discussed by Kenny, 2020) and the RMSEA value was greater than the cut-off point of .08, suggesting mediocre fit. However, alternative model fit indices suggested that the model fit might be considered adequate and that the model might be accepted.

¹ Standard criteria for good fit: non sig. Chi square test, cut-off point: RMSEA below .08/.06; CFI and TLI above .90/.95; SRMR below .08

The estimated mean value of the intercept growth variable at baseline level (the end of the 5th grade) was 4.65 ($p < .01$). On a scale in which the maximum was five, this intercept mean indicated high initial levels of pupils' competence beliefs in Visual Arts. The statistical significance of this parameter is not very informative as it only indicates difference from zero. The variance of the intercept ($p < .01$) suggests significant variability in this score across pupils at the end of the 5th grade. The estimated mean for the slope was negative and amounted to -0.10 ($p < .01$), indicating a significant decline in pupils' competence beliefs in Visual Arts over time. On average, values of pupils' competence beliefs dropped by 0.10 each school year. The variance of the slope showed that slope varied significantly across pupils ($p < .05$), suggesting that pupils' competence beliefs did not decrease at the same rate for all participants and that some pupils showed a steeper decline than others. However, the size of the variance of the slope suggested that the variation is not very large and that individual growth curves did not differ in their steepness to a great extent. The correlation between intercept and slope was -0.27 and non-significant, indicating that, in the Visual Arts domain, the rate of change was not dependant on the initial level of pupils' competence beliefs.

In summary, the results of the examination of the trajectory of pupils' competence beliefs in Visual Arts over the course of lower secondary education revealed that growth curves started with a very high initial level of pupils' competence beliefs at the end of the 5th grade and demonstrated a slight, but significant decline up until the end of the 7th grade. Findings indicating a trend of declining values of pupils' competence beliefs over the course of lower secondary education in a subject not yet explored in previous research support the universal nature of this trend across different subject domains, as suggested by other authors in the field (Wigfield, 1994; Wigfield & Eccles, 2000). Furthermore, the fact that these same trends were observed across educational systems characterised by very different organisational structures, teaching and learning practices and transitional periods reinforces the notion of this universality and stresses the importance of developmental and maturational factors in this change.

In addition, the results confirmed significant inter-individual variability in initial values and rates of change in pupils' competence beliefs over a three-year period and highlights the need to further explore the sources of these variations and identify individuals and/or groups of pupils demonstrating differential growth trajectories. Because gender might potentially be one of the variables that contributed to differences in pupils' trajectories of competence beliefs, we performed multiple group LGCM to test this hypothesis.

Multiple group LGCM: In what manner do the trajectories of pupils' competence beliefs differ among girls and boys?

Multiple-group growth modelling that takes gender into account allows one to test whether there are multiple developmental pathways or a common developmental

trend among the examined groups (Duncan & Duncan, 2009). Contrary to a single-group growth model, where all model parameters are set as equal across all groups, in this case all parameters are allowed to vary freely across groups, which is equivalent to estimating a growth model within each group separately (Curran et al., 2010).

Table 3 presents the means and variances of a multiple group (girls and boys) latent growth model of competence beliefs in Visual Arts over the course of lower secondary education.

Table 3.

The means and variances of intercept and slope for competence beliefs in Visual Arts: Girls and boys

		GIRLS		BOYS	
		Intercept	Slope	Intercept	Slope
Mean	Estimate	4.82**	-0.11**	4.51**	-0.09**
	S.E.	0.02	0.02	0.03	0.02
Variance	Estimate	0.17**	0.02	0.40**	0.07
	S.E.	0.04	0.02	0.08	0.04
Correlation Intercept with Slope		-0.11		-0.30	

**p<.01 *p<.05

Although a chi square test was again significant $\chi^2(2)=9.906, p<.01$, goodness-of-fit indices suggested that the model fit the data adequately, where RMSEA=.08; CFI=.977; TLI=.930; SRMR=.024. The contribution from each group was 3.957 for girls and 5.948 for boys, where larger chi-square values (among boys) indicate worse fit.

The results of a simultaneous group LGCM among girls and boys indicated that, for each independent group, the means and variances of the intercept were statistically significant ($p<.01$). Estimated initial values of competence beliefs in Visual Arts were somewhat higher for girls than for boys, while individual differences in these initial values were larger for boys than for girls. The means of the slope were also statistically significant for both independent groups ($p<.01$), indicating that there was a decline in the values of competence beliefs over time for both girls and boys. However, the variances of the slope were not significant in both groups, suggesting that there were no individual differences in the rate of change of competence beliefs in girls' and boys' groups. Once again, non-significant correlations between intercept and slope indicated that, for both independent groups, the rate of change was not related to the initial values of competence beliefs.

In conclusion, the exploration of trajectories of competence beliefs across gender groups revealed similar growth trajectories of competence beliefs in Visual Arts for girls and boys, although initial values of competence beliefs in Visual Arts were significantly higher and more homogenous in the girls' group. For both groups, competence beliefs demonstrated a similar tendency of a slight decline over three years of lower secondary education and no within-group differences in the steepness or flatness of the slope.

Conditional LGCM of Pupils' Competence Beliefs in Visual Arts

To what extent do the subjective domain value of Visual Arts and pupils' achievement in the subject explain variability in the change in competence beliefs?

A conditional latent growth curve model was specified for the exploration of the effects of external variables on the trajectory of pupils' competence beliefs. Four predictors measured at the midpoint/end of the 5th grade were added to the models and allowed to covariate: pupils' estimates of subject's utility value, intrinsic value and costs (expressed as level of subject difficulty) and pupils' achievement in the subject. These variables were included as time-invariant, prospective predictors to determine whether they could explain individual differences in the change in pupils' competence beliefs over time. The conditional model specification evaluated how well these predictors could predict growth trajectory parameters, i.e. explain average initial level (intercept) and rate of change (slope) over time.

Table 4 presents estimates of associations between predictors and LGCM parameters, i.e. unstandardized paths coefficients of intercept and slope regressed on four time-invariant predictors.

Table 4.

Unstandardised path coefficients leading from four time-invariant predictors to growth trajectory parameters: Intercept and slope of pupils' competence beliefs in Visual Arts

	Intercept		Slope	
	Estimate	S.E.	Estimate	S.E.
Utility value	0.04*	0.02	0.01	0.01
Intrinsic value	0.08**	0.02	-0.02	0.01
Costs (Subject difficulty)	-0.12**	0.02	-0.01	0.02
Achievement in Visual Arts	0.47**	0.05	-0.18**	0.04

**p<.01 *p<.05

Including time-invariant predictors in the model for Visual Arts improved model fit. Goodness-of-fit indices suggested that the model fits the data well, as RMSEA=.044; CFI=.981; TLI=.924; SRMR=.019. Chi square of the model fit was the only indicator that suggested misfit, as it was still significant, $\chi^2(1)=17.173$, $p<.01$.

Pupils' achievement in Visual Arts in the 5th grade and their estimates of the subject's intrinsic and utility value had a significant positive effect on intercept, while the effect of subject difficulty estimation was negative. The effect of pupils' achievement in the subject was by far the strongest. For every unit increase in subject grade (e.g. from 2 to 3 or 4 to 5), the initial value of pupils' competence belief was .47 units higher. It was also the only predictor that also had a significant effect on the slope. The value of the path coming from this predictor to the slope was negative, meaning that pupils with a higher subject grade at the end of the 5th grade experienced a smaller decline in their competence beliefs over three years of lower secondary education than pupils with lower subject grades. The effects of three indicators of the subjective domain

value of Visual Arts were very close to zero, and therefore not significant, suggesting that these external variables were not predictive of steeper or flatter rates of change in pupils' competence beliefs over time.

The finding that pupils' achievement in Visual Arts was the strongest predictor of individual differences in intercept and the only significant predictor of the slope growth variable confirmed the strong relationship between these variables, even indicating the dependence of pupils' competence beliefs on previous achievement and experiences of success and failure within the subject domain. This is consistent with Bandura's (1986) observation that pupils' competence beliefs are enhanced if they are performing well and experiencing success in their endeavours and similarly support his claim regarding previous mastery experience as the most relevant source of information for the formation of favourable self-appraisals.

The finding demonstrating that higher initial values of pupils' competence beliefs were predicted by higher estimates of the subject's utility and intrinsic value and lower estimates of difficulty level highlights the importance of the relationship between the subjective value of the subject for pupils and their competence beliefs within the same domain. Pupils tended to believe that they were good at subjects that they also perceived as interesting, useful and not difficult. However, finding indicating that the rate at which competence beliefs changed over time did not differ according to pupils' ratings of subjective value suggested that the effects of initial perceptions about the subject were not simple nor long lasting. It is likely that the inclusion of indicators of subjective subject value as time-varying predictors (i.e., predictors whose values could also change across time (from the 5th to the 7th grade)) would result in a more complete model that would allow for the examination of the degree to which these predictors changed in line with changes in pupils' competence beliefs over time.

Conclusions

The results presented in this paper represent first insights into the development of pupils' competence beliefs in the subject domain of Visual Arts in Croatian education. Examination of pupils' competence beliefs over the course of lower secondary education demonstrated very high competence beliefs at the end of the 5th grade, followed by a slight, but statistically significant decline up until the end of the 7th grade. Latent growth curve modelling proved useful in revealing the existence and size of inter-individual variability in intra-individual change in competence beliefs over the observed period and in exploring the effects of pupils' estimates of the subjective value of Visual Arts and their subject grades on the growth trajectory. Future research should aim to widen the period of exploration and add additional time points in order to enable a more precise and accurate examination of the form of change. It would make equal sense to extend the observation of pupils' competence beliefs into the 8th grade of elementary school and even beyond, into upper secondary education, as well as to organise studies that would position baseline measurement before the transition from classroom to subject teaching (e.g., in the 3rd or 4th grade), when this transition is probably not yet

in sight. Future research might also incorporate models that would specify parallel growth of competence beliefs and subject achievement or include some time-varying predictors to better explore the complexities of the relationships between variables in change over time.

Future research could also benefit from the expansion of the sample and inclusion of pupils from communities outside the country's capital. It is reasonable to assume that pupils' perceptions of school subjects and their competences and achievements within subject domains might be different in contexts with fewer resources.

References

- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioural change. *Psychological review*, 84(2), 191. <https://doi.org/10.1037/0033-295X.84.2.191>
- Bandura, A. (1986). The explanatory and predictive scope of self-efficacy theory. *Journal of Social and Clinical Psychology*, 4(3), 359-373. <https://doi.org/10.1521/jscp.1986.4.3.359>
- Byrne, B. M. (2013). *Structural equation modeling with Mplus: Basic concepts, applications, and programming*. Routledge. <https://doi.org/10.4324/9780203807644>
- Curran, P. J., Obeidat, K., & Losardo, D. (2010). Twelve frequently asked questions about growth curve modelling. *Journal of Cognition and Development*, 11(2), 121-136. <https://doi.org/10.1080/15248371003699969>
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behaviour*. Plenum. <https://doi.org/10.1007/978-1-4899-2271-7>
- Duncan, T. E., & Duncan, S. C. (2009). The ABC's of LGM: An introductory guide to latent variable growth curve modelling. *Social and Personality Psychology Compass*, 3(6), 979-991. <https://doi.org/10.1111/j.1751-9004.2009.00224.x>
- Eccles J. S., Adler, T. F., Futterman, R., Goff, S. B., Kaczala, C. M., Meece, J. L., & Midgley, C. (1983). Expectancies, values, and academic behaviors. In J. T. Spence (Ed.), *Achievement and achievement motivation* (pp. 75-146). W. H. Freeman.
- Eccles, J. S., & Wigfield, A. (1995). In the mind of the achiever: The structure of adolescents' academic achievement related-beliefs and self-perceptions. *Personality and Social Psychology Bulletin*, 21, 215-225. <https://doi.org/10.1177/0146167295213003>
- Eccles, J. S., Wigfield, A., Harold, R., & Blumenfeld, P. B. (1993). Age and gender differences in children's self and task perceptions during elementary school. *Child Development*, 64, 830-847.
- Freiberger, V., Steinmayr, R., & Spinath, B. (2012). Competence beliefs and perceived ability evaluations: How do they contribute to intrinsic motivation and achievement? *Learning and Individual Differences*, 22(4), 518-522. <https://doi.org/10.1016/j.lindif.2012.02.004>
- Geiser, C. (2012). *Data analysis with Mplus*. Guilford Press. <https://doi.org/10.1007/978-3-531-93192-0>
- Huang, C. (2013). Gender differences in academic self-efficacy: A meta-analysis. *European Journal of Psychology of Education*, 28(1), 1-35. <https://doi.org/10.1007/s10212-011-0097-y>

- Jokić, B. (2013). *Science and religion in Croatian elementary education: Pupils' attitudes and perspectives*. Institute for Social Research in Zagreb.
- Kelloway, E. K. (2014). *Using Mplus for structural equation modelling: A researcher's guide (2nd edition)*. Sage Publications.
- Kenny, D.A. (2020). *Measuring model fit*. <http://davidakenny.net/cm/fit.htm> (November 11th 2020)
- Marušić, I. (2003). Nastavni programi iz perspektive učenika [The teaching curriculum from the pupil's perspective]. In: B. Baranović (Ed.), *Nacionalni kurikulum za obvezno obrazovanje u Hrvatskoj – Različite perspektive* (pp. 181 – 218). Institut za društvena istraživanja u Zagrebu.
- Muthén, L. K., & Muthén, B. (2017). *Mplus user's guide: Statistical analysis with latent variables, User's guide, Version 8*. http://www.statmodel.com/download/usersguide/MplusUserGuideVer_8.pdf (November 11th 2020)
- Schunk, D. H., & Meece, J. L. (2006). Self-efficacy development in adolescence. *Self-efficacy Beliefs of Adolescents*, 5, 71-96.
- Schunk, D. H., & Pajares, F. (2002). The development of academic self-efficacy. In: A. Wigfield & J.S. Eccles (Eds.), *Development of achievement motivation* (pp. 15-31). Academic Press. <https://doi.org/10.1016/B978-012750053-9/50003-6>
- Usher, E. L., & Pajares, F. (2008). Sources of self-efficacy in school: Critical review of the literature and future directions. *Review of Educational Research*, 78(4), 751-796. <https://doi.org/10.3102/0034654308321456>
- Wang, J., & Wang, X. (2019). *Structural equation modelling: Applications using Mplus*. John Wiley & Sons. <https://doi.org/10.1002/9781119422730>
- Wigfield, A. (1994). Expectancy-value theory of achievement motivation: A developmental perspective. *Educational Psychology Review*, 6(1), 49-78. <https://doi.org/10.1007/BF02209024>
- Wigfield, A., & Cambria, J. (2010). Expectancy-value theory: Retrospective and prospective. *Advances in Motivation and Achievement*, 16(part A), 35-70. [https://doi.org/10.1108/S0749-7423\(2010\)000016A005](https://doi.org/10.1108/S0749-7423(2010)000016A005)
- Wigfield, A., & Eccles, J. S. (1994). Children's competence beliefs, achievement values, and general self-esteem: Change across elementary and middle school. *The Journal of Early Adolescence*, 14(2), 107-138. <https://doi.org/10.1177/027243169401400203>
- Wigfield, A., & Eccles, J.S. (2000). Expectancy-value theory of achievement motivation. *Contemporary Educational Psychology* 25, 68–81. <https://doi.org/10.1006/ceps.1999.1015>

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Promjene učeničkih uvjerenja o kompetencijama u predmetu Likovna kultura u višim razredima osnovnoškolskoga obrazovanja: longitudinalna perspektiva

Sažetak

U ovom radu govori se o istraživanju promjene u učeničkim uvjerenjima o kompetenciji u predmetu Likovna kultura tijekom tri godine viših razreda osnovnoškolskoga obrazovanja na uzorku od 752 učenika osnovnih škola u Zagrebu. Učenička uvjerenja o kompetenciji prikupljena su u tri navrata, na kraju školske godine u 5., 6. i 7. razredu, pomoću jednoga pitanja „Koliko ti dobro ide predmet Likovna kultura?“ Bezuvjetno modeliranje latentne krivulje rasta (LGCM) ukazalo je na vrlo visoke početne vrijednosti učeničkih uvjerenja o kompetenciji te na blagi, iako značajan pad tijekom vremena. Opažen je varijabilitet među učenicima i za vrijednosti latentnoga odsječka i nagiba. Razvojne putanje učeničkih uvjerenja o kompetenciji za djevojčice i dječake pokazale su slične razvojne tendencije u obje nezavisne skupine, ali i ponešto niže početne vrijednosti i veći varijabilitet latentnoga odsječka za dječake. Uvjetovano LGCM je pokazalo značajne učinke učeničkih zaključnih ocjena iz predmeta u 5. razredu na latentni odsječak i nagib, što znači da su učenici s višim ocjenama iz Likovne kulture imali veće početno uvjerenje o kompetenciji i manje ga mijenjali tijekom vremena. Značajni učinci subjektivne vrijednosti Likovne kulture (utilitarna vrijednost, intrinzična vrijednost, težina predmeta) utvrđeni su jedino za latentni odsječak. Ovi prediktori nisu imali učinke na stopu smanjivanja učeničkih uvjerenja o kompetenciji u vremenu.

Ključne riječi: *Likovna kultura; longitudinalno istraživanje; subjektivna vrijednost zadatka; učenička uvjerenja o kompetenciji; viši razredi osnovnoškolskoga obrazovanja.*