Journal of Youth and Adolescence

The Development of Motivation to Study and Work Across the Mid-Schooling and School-to-Work Transitions

--Manuscript Draft--

Manuscript Number:	
Full Title:	The Development of Motivation to Study and Work Across the Mid-Schooling and School-to-Work Transitions
Article Type:	Empirical Research
Keywords:	Motivation; task-value; effort; school-to-work transition; school transition
Corresponding Author:	Jennifer Symonds, PhD University College Dublin Dublin, IRELAND
Corresponding Author Secondary Information:	
Corresponding Author's Institution:	University College Dublin
Corresponding Author's Secondary Institution:	
First Author:	Jennifer Symonds, PhD
First Author Secondary Information:	
Order of Authors:	Jennifer Symonds, PhD
	Ingrid Schoon, PhD
	Jacquelynne Eccles, PhD
	Katariina Salmela-Aro, PhD
Order of Authors Secondary Information:	
Funding Information:	

Title Page with ALL Author Contact Information

The Development of Motivation to Study and Work Across the Mid-Schooling and School-to-Work Transitions

Jennifer Symonds[1]

Ingrid Schoon[2]

Jacquelynne Eccles[3]

Katariina Salmela-Aro[4, 5]

[1]School of Education, University College Dublin, Belfield, Dublin 4, Ireland
jennifer.symonds@ucd.ie, ph. +353 1716 7995 (corresponding author)

[2]Institute of Education, University College London, 20 Bedford Way, Bloomsbury, London WC1H 0AL, United Kingdom
ischoon@ioe.ac.uk

[3]School of Education, University of California, Irvine, CA 92697, United States
jseccles@uci.edu

[4]Educational Sciences, University of Helsinki, Yliopistonkatu 4, 00100 Helsinki, Finland
katariina.salmela-aro@helsinki.fi

[5]Department of Psychology, University of Jyväskylä, Seminaarinkatu 15, 40014 Jyväskylän yliopisto, Finland

Declarations of interest: None

Funding: This work was supported by the Jacobs Foundation (Pathways to Adulthood) and the Academy of Finland

The Development of Young People's Motivation to Study and Work Across the Mid-Schooling and School-to-Work Transitions

Author Affiliations and Interests

Jennifer Symonds is Assistant Professor of Education, and the Director of Research and Director of Doctoral Studies, at the School of Education, University College Dublin, Ireland. Her research focuses on how engagement and well-being develop within educational contexts and across educational transitions, during childhood, adolescence and young adulthood.

Ingrid Schoon is Professor of Human Development and Social Policy at the Institute of Education, University of London, Research Director of the Department of Quantitative Social Science. She is interested in the study of capacity building and social inequalities in attainment. In particular her research focuses on the study of risk and resilience, especially during the transition from dependent childhood to independent adulthood, and regarding social and gender equalities in attainment, health and well-being.

Katariina Salmela-Aro is Professor of Educational Sciences, University of Helsinki, Finland, and Visiting Professor in the Institute of Education in University College London, Australian Catholic University Sydney and School of Education in Michigan State University. She is the President of the European Association for Developmental Psychology. Her interests are motivation, well-being, educational transitions and related interventions.

Jacquelynne S. Eccles is Distinguished University Professor of Education at the School of Education, University of California, Irvine and Professional Fellow at the Australian Catholic University. Her research focuses on motivation, identity and achievement related life choices.

The Development of Young People's Motivation to Study and Work Across the Mid-Schooling and School-to-Work Transitions

Abstract

In this study we examined how motivation to study and work developed across adolescence and young adulthood (5-waves of data), in a sample of 878 youth (52% male) in Finland, using the construct of task-values. We found that negative task-values (disinterest, futility, inertia) decreased across time, whilst attainment value increased, suggesting a deepening of involvement and investment in main activity with age. Reductions in disinterest and inertia were steeper for youth transferring into vocational education in adolescence (the mid-schooling transition), and for youth transferring from an academic track to higher education in young adulthood (the school-to-work transition). Task values altered the most at the latter transition, signaling its importance in the life-course for motivation development.

Keywords

Motivation; task-value; effort; school-to-work transition; school transition

The Development of Young People's Motivation to Study and Work Across the Mid-Schooling and School-to-Work Transitions

In this study, we examined how young people's motivation, conceptualized as task-values, developed as they moved from comprehensive school to vocational or academic school at age 16-years (the *mid-schooling transition*), then to a range of activities including higher education, polytechnic and working at age 19-22-years (the *school-to-work transition*). Task-values concern the usefulness people ascribe to a task for goal attainment (utility value), their interest in the task (intrinsic value), the value of the task for that person's actualization (attainment value) and the drawbacks associated with the task pursuit (cost) (Eccles & Wigfield, 1995). This research addresses an important need to extend the time frame of task-values research, as most developmental research on task-values is conducted with school students (Gniewosz & Watt, 2017; Wang, Chow & Amemiya, 2017) and researchers have called for more longitudinal work in this area (Wang, Chow, Degol & Eccles, 2017).

Second, no study has yet examined how task-values develop across sequential educational transitions in the second and third decades of life. Although we have some understanding of motivation development at the mid-schooling transition (e.g. Aunola, Leskinen & Nurmi, 2006; Eccles et al., 1993; Gniewosz, Eccles & Noack, 2015), the school-to-work transition in young adulthood is understudied in this area. Third, task-values are typically studied at the level of individual school or college subjects such as languages, literacy, maths, science and sports (Chow, Eccles & Salmela-Aro, 2012; Gaspard et al., 2017; Wang et al., 2017 a, b) and not at the broader level of main activity such as studying or working. This means we know little about how people's motivation for their main activity develops across time.

Accordingly, in this study we examined how task-values towards studying and working developed across the mid-schooling and school-to-work transitions in Finland. Here, we focused on how those values developed depending on whether young people were on an academic or

vocational track, which are the main categories of main activity in mid- to late-adolescence and young adulthood in Finland. We assumed that task-values would increase across both transitions, as young people moved through a system of 'increasingly personalized social structures': from comprehensive school to vocational or academic schooling at age 16-years, then to a diverse set of post school activities by age 19-22-years. Theoretically, this increase in main activity options should allow for a better fit between young people's psychology and their environment, optimizing the chances for positive stage-environment fit (Eccles et al., 1993), suggesting that young people's motivation should increase as the match between the social structure of the main activity and their personal psychology becomes closer across time. We explain this theoretical perspective in more detail below.

The task-values concept

In this study, we focused on the task-values concept drawn from Eccles' and colleagues' (Eccles et al., 1983; Wigfield & Eccles, 2000) expectancy value theory (EVT) of motivation. In EVT, people are assumed to choose to participate in specific activities based on the expectations they hold of their capabilities in that domain, and the value they attach to those activities. The core task-values in EVT are how much a person thinks a task is useful in achieving a goal (utility value), finds it important to do well in a task for actualizing their personal and collective identities (attainment value), is interested in the task (intrinsic value), and invests their energy and emotions in the process of attaining it (cost) (Eccles & Wigfield, 1995). More recent conceptualizations of cost see it as multi-dimensional: incorporating cost of effort, emotion, and opportunity (Gaspard et al., 2018).

Although task-values are "conceptualized as task-specific; that is, they are shaped by qualities of different tasks that influence the probability an individual will engage in them" (Gaspard et al., 2015, p.56), this does not limit studies of task-value to school or college subjects, such as maths and science. The notion of a task can comprise multiple dimensions and levels,

ranging from focused to broader tasks. It can include tasks in lessons (e.g. reading comprehension task), individual school subjects as tasks (e.g. studying mathematics), and broader tasks such as going to school, studying, or working, which we focus on here. It is possible to consider tasks as multi-level, for example studying at school can be broken down into increasingly smaller components, such as studying maths, studying algebra as part of the maths curriculum, and doing algebra quizzes in class – and can be expanded to refer to more distant goals, such as study or occupational choice.

Support for this multi-level structure comes from qualitative research, where children explained that their overarching feelings about school (e.g. I like school) had formed due to their daily experiences with teachers, peers and school-work; and their interpretation of how these experiences impacted their self-concept and identities (Symonds & Hargreaves, 2016). These results suggest that task-values concerning 'upper-level' tasks, such as global effort towards school (Schoon & Ng-Knight, 2017), may emerge out of a cumulation of lower-level experiences (e.g. doing algebra quizzes and long division in maths) (Hidi & Renninger, 2006; Symonds & Hargreaves, 2016). Arguably then, it is possible to study task-values for any type of task, be it big or small. Indeed, this notion may lead to rich future research on how each level of task experience is shaped by sociocultural and individual factors, culminating in overarching motivational dispositions enacted in a broader task domain.

Stage-environment fit theory

The current research focuses on how task-values for study and work developed across age-graded transitions in adolescence (Benedict, 1938) and young adulthood, where organisational structures (often operating across a nation) require people to make the same type of transition at a similar age. Eccles and colleagues' (Eccles et al., 1993) stage-environment fit theory posits that motivation develops across age-graded transitions, in accord with changes in fit between people's developmental characteristics and the pre- and post-transition environments.

For example, at the mid-schooling transition, if an adolescent desires greater learner autonomy in their new school and does not get it, boredom and eventual disengagement may ensue. Following expectancy value theory, these negative experiences may lead them to devalue school, and put less effort into their studies (Mac Iver, Klingel & Reuman, 1986). In comparison, more positive adaptation may ensue when the interactions between people and their new environments are harmonious. In this study, we see stage-environment fit as the mechanism for how task-values increase or decrease depending on which main task young people transfer to at the mid-schooling and school-to-work transitions.

Increasingly personalized main activities

Turning to social context, we apply the notion of stage-environment fit to sequential transitions in adolescence and young adulthood. Here, we introduce our own concept of *increasingly personalized main activities* that builds on Benedict's idea of age-graded transitions, discussed briefly above. In many Western, Educated, Industrialized, Rich and Democratic (WEIRD) societies, adolescents are expected to attend comprehensive schooling during lower secondary education, where they have little, and sometimes no, subject choice. The curriculum is generally broad, which theoretically allows them to develop and hone their interests in individual subjects.

Adolescents are awarded their first major choice of what to study at the start of upper secondary education, where they can select a narrower set of subjects according to their skills and interests. In Finland, the setting of the current study, adolescents transfer from comprehensive schools at the age of 15/16 into either an academic high school or a vocational school, where they continue their schooling until around age 18/19 years. Academic schools typically prepare students for entrance to university or polytechnic, whereas vocational schools are focused on vocational education and more direct routes to employment.

Then, at around age 18/19, adolescents (now young-adults) can transfer out of these academic or vocational schools to an even more specific activity, such as studying for university entrance examinations, studying at university or polytechnic, working, military service, or taking a gap year; creating even greater specificity for their career-related developmental trajectories. Readers can imagine increasingly personalized main activities as two pyramids pointing in opposite directions where the range of choices becomes greater at each transition point allowing for a more personalized match between skills, interests and the activity, but the range of activities engaged in after transition is narrower. Theoretically, this increasing personalization of main activity, or task, should allow young people to optimize their engagement experiences and support their self-concept, in turn facilitating positive growth in task-values and effort, as predicted by Eccles (2009).

Although offering increasingly personalized main activities to young people might seem logical for societies to do, it is also true that socialization pressures come from parents, teachers and peers, and from the broader communities (or cultures), that can support or inhibit young people from aspiring to a pathway that might ideally suit their skills and interests (Brandtstädter, 2009). However, in an English nationally representative sample where the link between socioeconomic status (SES) and attainment was strong, the link between SES and educational expectations and effort was much weaker, suggesting that young people have some degree of agency in moving into academic or vocational main activities after age-graded transitions (Schoon & Ng Knight, 2017).

In this study, we are interested in examining whether the increasingly personalized main activities in Finland promotes enhanced stage-environment fit across age-graded transitions in adolescence and young adulthood. In an international context, Finland has relatively weak associations between parents' life-time educational attainment, and their children's educational attainment and occupational status (i.e. social mobility) (Breen & Jonsson, 2005). Although the

connection is still there, it is quite varied amongst families with lower SES, suggesting that alternative contextual and personal factors (that are perhaps modifiable and locally varied) are impacting young people's life chances (Kallio, Kauppinen & Erola, 2016). Theoretically, in a context where young people have sufficient agency over selecting and pursuing their main task, their motivation should increase across increasingly personalized main activities as predicted by stage-environment fit theory. This is the core assumption we test in this study.

Development of task-values across adolescence

Studies examining the development of task-values in individual school and college subjects across time are limited but growing in number (see for example Chow et al., 2012; Gaspard et al., 2017; Wang et al., 2017 a, b). When focused on average trajectories within samples, they generally demonstrate a decline in task-values across adolescence: for example declining task-values in sport across Grades 8 and 9 in Finland (Yli-Piipari, Jaakkola, Liukkonen & Nurmi, 2013), declining task-values in maths, language arts and sports over Grades 1 to 12 in the United States (Jacobs, Lanza, Osgood, Eccles & Wigfield, 2002), and declining task-values in English and science across Grades 7 to 11 in Australia (Watt, 2004). However, person-oriented analyses of task-values in sports (Wang, Chow & Amemiya, 2018), physics and chemistry (Wang et al., 2017), find that only around 20 per cent of participants can be clearly classed as having declining task-values, whereas around 60 per cent of participants report stable task-values across secondary school. This suggests that where main trajectories of task-value are discerned using mean values analysis, this likely conveys a large group of participants whose values develop in that direction, rather than the trajectory being true of all participants. Although person-oriented analyses have their strengths, as we have harnessed in other studies (AUTHORS 2016; 2017), in this explorative analysis of task-values we wanted to first examine the overall patterns of development and how these responded to changes in main activity, before attempting a sub-group analysis.

The present study

In this study we examined how task-values towards studying and working developed across the mid-schooling and school-to-work transition, using longitudinal data gathered in Finland. With prior research on task-values conducted mainly in the United States, focusing on the development of task-values in individual school subjects, there was little evidence to inform our predictions about how task-values towards studying and working might develop across these two age-graded transitions in Finland. Based on our theoretical perspective of increasingly personalized main activities and stage-environment fit, we assumed that task-values towards studying and working should increase as participants encountered more personalized transition demands, by moving into main tasks that were more personalized, specifically academic vs. vocational school, and from there to a wider range of tasks at the school-to-work transition. Our main research question was therefore exploratory: *How do task-values develop across two age-graded transitions in Finland?* Here, we were interested in the overall development of task-values across time.

Next, we were curious whether the growth in task-values was steeper at the mid-schooling or school-to-work transition, or was similar across both transition periods. Given the sparsity of research on task-values and motivation more broadly at the school-to-work transition, we wanted to explore the impact of this later transition on task-value, i.e. motivation growth. Our second research question was: *How is task-value development predicted by transition type?*

We also made a tentative assumption about task-value development depending on whether participants transferred into an academic versus vocational school at the mid-schooling transition, based on prior analyses of other motivational variables. In Finland, Salmela-Aro, Kiuru and Nurmi (2008) found that adolescents on an academic track had greater increases in cynicism and apathy, than those on a vocational track, after the mid-schooling transition, which they expected had occurred due to a poorer stage-environment fit in academic school. Similarly,

in England, Symonds, Dietrich, Chow and Salmela-Aro (2016) observed an increase in stress and depression for adolescents studying an academic curriculum at school after age 16-years, but a decrease in those variables for adolescents transferring from comprehensive school to vocational education, employment or training (i.e. an apprenticeship), which they attributed to better stage-environment fit occurring in more vocational activities. Our final research question therefore concerns the impact of academic versus vocational track on task-value development at the two transitions: *How is task-value development predicted by main activity?*

To answer our research questions, we modelled the growth of task-values across each transition using piecewise latent growth curve models (PGCM), then explained differences in growth according to the variable of which educational track participants were on (vocational or academic) between age 15/16 and 18/19-years, after controlling for gender, socioeconomic status and attainment, which are shown to impact task-values of school subjects in prior research (Chow et al., 2012; Gaspard et al., 2017).

Method

Participants and Procedures

The XXX studies are a collection of longitudinal studies of Finnish adolescents, managed by XXX. The participants in this analysis were first surveyed in January 2004, at age 15-years in their second to last year of comprehensive school (Wave 1, N = 707), and have been studied up to age 30-years at the time of writing. To maintain a focus on the mid-schooling transition and school-to-work transition periods, the following data were used in the analysis. Wave 1 as described; Wave 2: N = 818, 16-years; Wave 3: N = 749, 17-years; Wave 4: N = 611, 19-years; Wave 5, N = 599, 22-years. The total dataset consisted of 878 cases (52.4% male). Missing data percentages and handling are reported in the analysis section.

Measures

Task-value. Dimensions of participants' task-value towards studying or working were repurposed from the Achievement Goal Orientations and Motivational Beliefs inventory (Eccles et al., 1993; Niemivirta, 2002) and the School Burnout Scale (Salmela-Aro, Kiuru, Leskinen & Nurmi, 2009), as there was no measure of task-value in the dataset that focused on study and work as main activities. Rather, the above measures yielded multiple sets of items, each addressing a specific task-value, be it interest, attainment, utility or cost. The subject of the valuing was consistent across items and measures, in line with the broader aims of the longitudinal study. During the school period the subject of the valuing was studying, whereas post-school it was studying/working (exact wording translated from Finnish). This consistency gave us the ability to create a custom-built measurement of global task-values, using items developed out of the achievement motivation field which has a reasonably consistent theoretical base (Wigfield & Cambria, 2010). To maximize the value of longitudinal studies for answering new research questions across the eras, it is important to be able to repurpose older items into newer concepts such as our concept of global task-values towards studying and working. Otherwise we are limited to performing analysis on an older conceptual structure that psychology may have progressed in theory, but not in practice.

As most items in the current study were negatively worded, we labelled three of the four dimensions as negative indicators of task-value. These were *disinterest*, experiencing a lack of interest and feeling boredom in the main activity; *futility*, that is perceiving the main activity to be worthless to pursue and engage in; and *inertia*, withholding effort from the activity. *Attainment value*, being the value that the activity holds for the individual person, was positively worded. All items were measured on a scale of 1 (low) to 6 (high). Table 1 demonstrates the fit between the repurposed items and a landmark measure of task-values designed by Eccles and Wigfield (1995). Here, readers can see that the constructs measured fit well as inverse facets of the positive task-value dimensions, meaning that they tap into the same general area of

psychological functioning. The average and range of the five reliability scores in the current study was as follows: Attainment (*M* α = .86; α range = .84 - .89), Disinterest (*M* α = .67; α range = .62 - .75), Futility (*M* α = .70; α range = .69 - .76), Inertia (*M* α = .79; α range = .73 - .83).

Gender. Participants reported their gender as female (1) or male (0).

Parental employment. We included a measure of parental employment as an ordinal variable of 1 = low (unemployed), to 4 = high (white-collar occupation), as a control in the models and as a covariate of intercept and slope.

Self-reported grades. At the end of each school year, participants received a letter grade from their teachers which represented an achievement level of 4 (lowest) to 10 (highest). Participants reported their average score across subjects at the end of comprehensive school (Wave 1) and at the end of tracked education (Wave 3). This type of self-reported GPA has been shown to correlate at .96 with actual GPA (Holopainen & Savolainen, 2005). However, it must be interpreted with caution, as it is a measure of self-reported grades not actual achievement levels. Accordingly, it likely shares variance with other aspects of psychology including self-concept and integrity. Because of these limitations, we used it in this analysis as a control variable.

Educational track. In Wave 2 at age 16-years after the MST, researchers recorded the current school that participants were in at the time of interview. Participants also confirmed whether they had transferred to vocational school (0) or academic high school (1).

Main activity in young adulthood. In young adulthood at age 19-22 years, participants reported their main activity as being either vocational school, working, polytechnic or university. A minority of participants (Wave 4 = 22%, Wave 5 = 12%) were engaged in less prevalent activities including compulsory military or civic service for males which must be taken before 28-years of age, taking a gap year, and unemployment. These pathways were used as descriptive data to inform our discussion of findings.

School level variable. school that participants were in at Wave 2 (N = 20) was used to control for between school variance in the models.

The longitudinal study did not measure ethnicity, outside of asking what mother tongue was spoken by the adolescent and their parents at home. Analyses of those data revealed that under 2% of participants spoke a mother tongue at home other than Finnish creating a lack of variance in the data. Therefore, ethnicity was not included in the study.

Analysis

Data preparation

Missing data

Of the total 878 respondents who had given survey data, 35.7% had complete data at all waves; whereas 27.7% were missing data on one wave, 19.6% on 2 waves, 10.0% on 3 waves, and 6.9% on 4 waves. This prevalence of missing data is typical of longitudinal self-report studies of this age group, given the variability in young people's post-school pathways and systematic changes in survey administration across time (Kyndt et al., 2015). A significant result on Little's MCAR test indicated that the data were not missing completely at random (MCAR) and were instead missing at random (MAR) ($\chi 2$ (7010) = 8063.130, p = .000), meaning that missingness was systematically related to variables within the dataset. Using a binary variable of missingness, that included attrition (missing data on one or more waves) which also covered item non-response, we identified that missingness was predicted by several background factors and many of the task-value/inertia items. The strongest predictors of missingness were moving to vocational school at age 16-years (b = .028, p < .000), having lower self-reported grades at the end of tracked education (b = .025, p < .000), and comprehensive schooling (b = .027, p < .000), and being male (b = .026, p < .000). The majority of task-value/inertia items predicted missingness weakly, with beta-weights of around .10 and frequent insignificance. We handled missing data in our analyses in

Mplus 8.0, by the default method of full information likelihood maximum (FIML), which estimates models using all available data.

Confirmatory factor analysis (CFA) of task-values

After preparing the data, we computed a CFA for the four task-value dimensions, modelled simultaneously at each wave. Model fit was acceptable at each time (Table 3) with all loadings significant. The range of loadings at each wave was good: W1 (futility: .51 - .86; attainment .59 - .80; disinterest .66 - .70; inertia .61 - .83), W2 (futility: .40 - .69; attainment .60 - .88; disinterest .72 - .65; inertia .58 - .79), W3 (futility: .53 - .67; attainment .61 - .85; disinterest .71 - .73; inertia .69 - .87), W4 (futility: .45 - .86; attainment .63 - .86; disinterest .64 - .80; inertia .71 - .90), W5 (futility: .55 - .87; attainment .66 - .93; disinterest .71 - .84; inertia .53 - .85). The pattern of weakest and strongest loadings within factors was consistent across waves, indicating weak invariance in the factor structure, however the loadings differed quantitatively, indicating that the unconditional models were not invariant at the metric level (Bialosiewicz, Murphy & Berry, 2013).

Factorial invariance

We therefore continued by testing for differences in the factor structures across waves (Widaman, Ferrer & Conger, 2010). To do this we computed separate CFA models for each dimension, modelling factor structure simultaneously across waves. For each dimension, we compared the unconditional model to a model with strict factorial invariance, using the Satorra-Bentler Scaled $\chi 2$ comparison test to check for significant differences in the $\chi 2$s. The results were significant for futility ($\chi 2\ \Delta = 290.44$, df = 20, $p = < .001$), attainment ($\chi 2\ \Delta = 117.41$, df = 12, $p = < .001$), disinterest ($\chi 2\ \Delta = 207.94$, df = 12, $p = < .001$) and inertia ($\chi 2\ \Delta = 199.91$, df = 20, $p = < .001$), indicating variance in the factor loadings, item intercepts, factor variances or item error terms. Therefore, to ensure comparability of constructs over time and to standardize our analyses, we applied strict factorial invariance to the main models described below, without restraining the means of the latent variables, to allow growth modelling to occur.

Data modelling

Piecewise models

To answer our research questions, we computed piecewise growth curve models (PGCM) in Mplus version 8.0. In PGCMs, researchers identify a turning point, or 'knot' in a curvilinear growth trend, and use this to separate the trend into separate slopes, to compare them (Ning & Luo, 2017). This provided us with an ideal model to test growth across the mid-schooling transition (W1 – W3) versus across the school-to-work transition (W3 – W5), for each dimension, to answer Research Question 1. Standardized results across models also allowed us to compare rate of change across dimensions, such as between attainment and futility. Then, to answer Research Question 2 about the impact of being on an academic versus vocational route, we applied the track variable as a covariate of intercept and slopes, after controlling for gender, self-reported grades and SES. Because the longitudinal study collected data from participants nested in schools, we controlled for the impact of this multilevel structure by using the type=complex command with school id (n = 20) as the cluster variable.

Results

Descriptive statistics

At the mid-schooling transition, 40% transferred to a vocational school, whereas 60% transferred to an academic school. Then, at age 22, 7% were still at vocational school, 28% continued to university, 23% to polytechnic, 36% were working, 42% were involved in a different activity as described in the methods section (e.g. military service, gap year, care giver, studying for university entrance examinations).

Questions 1 and 2: How do task-values develop across two age-graded transitions in Finland, and how is task-value development predicted by transition type?

In this study, task-value is represented by three 'negative' motivational variables (futility, disinterest and inertia) and one positive variable (attainment value). All variables developed in

the expected direction as demonstrated by the piecewise models, with all models fitting the data well (Table 4). Futility decreased gently at the mid-schooling transition (*M* = -.08, SE = .03, t = -2.27, *p* = <.023) and at the school-to-work transition (*M* = -.07, SE = .03, t = -2.39, *p* = .017) (Table 5, Figure 1). Attainment value was stable at the mid-schooling transition then increased steeply at the school-to-work transition (*M* = .16, SE = .05, t = 4.58, *p* = <.001) (Table 6, Figure 2). Disinterest decreased gently at the mid-schooling transition (*M* = -.11 SE = .02, t = -6.84, *p* = <.001) then at a greater rate at the school-to-work transition (*M* =-.17, SE = .02, t = -7.80, *p* = < .001) (Table 7, Figure 3). Inertia was stable at the mid-schooling transition (*M* = -.05 SE = .05, t = -0.85, *p* = .394) then declined steeply at the school-to-work transition (*M* = -.39 SE = .03, t = -11.76, *p* = <.001) (Table 8, Figure 4). Taken together, these trajectories demonstrate positive growth in task-values (e.g. declines in negative variables and increases in positive ones) across the two transitions.

Question 3: How is task-value development predicted by main activity?

In this section, we report the impact of educational track (main activity) on task-value development, after controlling for gender, grades and parental education. At the mid-schooling transition, being on a vocational versus an academic track, predicted steeper decreases in inertia (Table 8) and disinterest (Table 7), but had no association with growth in attainment value (Table 6) nor futility (Table 5). At the school-to-work transition, being on a vocational track predicted more gentle decreases in disinterest (Table 7), and steeper increases in attainment value (Table 6), but had no impact on growth in futility (Table 5), nor inertia (Table 8). These findings show a differential impact of vocational versus academic track depending on the age-graded transition.

Discussion

In this study we examined the development of task-values for studying and working (represented by futility, attainment value, disinterest and inertia), across the ages of 15 – 22-years. We queried how those values would develop comparatively across the mid-schooling and school-to-work transitions (Research Question 1) and whether this growth would be impacted by whether participants were on a vocational versus an academic track (Research Question 2). Our assumptions, underpinned by stage-environment fit theory and the notion of increasingly main activities were that participants would have positive growth in task-values, that this growth would be steeper across the school-to-work transition which offered a choice of more personalized routes than the former transition, and that the growth would be more positive for those on a vocational track.

Question 1: How do task-values develop across two age-graded transitions in Finland?

Fitting with our assumptions, we found that task-values for studying and working increased across the mid-schooling and school-to-work transitions. There, we observed that on average, Finnish youth had less feelings of futility and disinterest in their studies/work, higher levels of attainment value, and less desire to avoid studying/working, as they moved through adolescence and young adulthood. In line with our theoretical perspective (Eccles et al., 1993), our interpretation of these results is that Finnish youth experienced an increased stage-environment fit with each age-graded transition.

This finding contrasts with studies conducted with younger samples of children and early adolescents in the US (e.g. Archambault et al., 2010; Jacobs et al., 2002) and in other areas of Finland (Yli-Piipari et al., 2013), where task-values have declined across all or several of the time points. Regarding the US samples, it may be that participants' task-values declined because of the poor person-environment fit frequently documented in US middle schools (Eccles et al., 1993; Zoller Booth & Gerard, 2014). Regarding the other Finnish sample, task-values were evaluated only for physical education for a younger age group, so it is difficult to compare this

with the current study. Also, participants in the current study were older at the first wave (age 15-years) than participants in these other studies, therefore the development of their task-values may have been less vulnerable to deflation. Children are proposed to form a more realistic, and therefore less inflated view of themselves across time, which can influence their self-evaluations on self-report measures (Eccles, 1999). In comparison, participants in the current study were in mid-adolescence at Wave 1 and may have already reached an age where they realistically appraised their task-values.

Question 2: How is task-value development predicted by transition type?

These increases in task-values were most notable at the school-to-work transition, which lends support to our increasing personalization hypothesis. At the school-to-work transition, Finnish youth had a greater variety of pathways open to them (e.g. choices of university and polytechnic courses, employment options) than at the mid-schooling transition when they mainly attended either academic or vocational school. In line with Eccles' (2009) suggestions, this greater environmental personalization may have promoted more opportunities for skill development and subsequent self-concept affirmation, leading individuals to attach greater value to their activities and supporting the release of their energy into study/work directed effort.

Question 3: How is task-value development predicted by main activity?

Based on similar studies of the mid-schooling and school-to-work transitions (Salmela-Aro et al., 2009; Symonds et al., 2016), we assumed that being on a vocational track would relate to more positive growth in task-values for studying and working. Although growth in task-values was relatively consistent across tracks, there were some differences in the gradient of this growth. At the mid-schooling transition, participants on a vocational track reported steeper decreases in motivational variables with an emotional (disinterest) and behavioral (effort) component, but comparable growth in variables that reflected instrumental evaluation of their main activity (attainment value, futility).

Possibly, the vocational school environment was more conducive to students' interest and effort, because it offered more environmental complexity than the more sedentary environment of the academic school. In vocational school, students might have had more opportunities to "solve meaningful problems and/or fashion valued products with domain specific materials or tools, requiring the development of related skills" (Shernoff et al., 2016), which studies have found conducive to student engagement (Shernoff et al., 2016). Therefore, at the mid-schooling transition, we observed that both vocational and academic students valued their education more instrumentally, but that vocational students had notably greater increases in interest and effort, perhaps owing to the more practical nature of their school experience.

At the school-to-work transition, this pattern altered. Those on a vocational track reported steeper increases in attainment value, and more gradual decrease of disinterest. In other words, they evaluated their new activity as more useful for their future compared to their old activity, than did those on an academic track, but also felt a slower loss of disinterest. There were no differences between groups in futility nor inertia at the later transition. Here, participants on a vocational track may have felt greater immediate reward from their main activity for their personal attainment, compared to those on an academic track, given that most of these participants (109 out of 194), transferred to full time employment. There, they might have found more tangible reward for their efforts through receiving a salary and being able to complete tasks on a daily basis (Symonds et al., 2016).

Regarding the slower loss of disinterest, many of those jobs could have been typical entry level jobs for young school leavers, which require minimal cognitive effort to carry out, which is typical of first employment in young adulthood (Marshall, 2015). In comparison, most participants on an academic track transferred either to university (162 out of 402) or polytechnic (120 out of 402), where more tailored education programs and a new educational environment may have stimulated their interest in learning.

Conclusion

The main finding of our study is that there was a general increase in task-values to study and work across adolescence and young adulthood, in line with stage-environment fit theory combined with our notion of increasingly personalized main activities. However, there may be further influences at play, such as biological development (e.g. executive functioning), and social changes (e.g. pressure on individuals to become more autonomous) that were not measured here. The second finding is that study/work values fluctuated in relation to being on a vocational versus academic track at each transition point. Although education systems across many Western Countries theoretically offer increasing personalization through tracked education and/or differentiation of options after compulsory schooling at the school-to-work transition, the current study finds that any benefits of this structure are impacted by the qualities of the environments young people transition in and out of.

Taken together, these findings suggest that when task demands are designed so that young people's main tasks are a good fit with their skills and interests, and become increasingly personalized across time, this may enable young people to develop positive feelings towards their main task and put more effort into it as they age. Ideally this should result in more engaged populations of young people who can productively contribute to society. However, when main tasks within those structures do not offer enough environmental complexity nor relevant personal reward, this acts against the positive force of personalization, meaning that efforts put in by Governments and institutions to create these designs may have little impact. Put simply, to engage young people in their education and work, we need to provide engaging environments for them to thrive in.

References

Aunola, K., Leskinen, E., & Nurmi, J.-E. (2006). Developmental dynamics between mathematical performance, task motivation, and teachers' goals during the transition to

primary school. *British Journal of Educational Psychology, 76*(1), 21-40. doi:doi:10.1348/000709905X51608

Benedict, R. (1938). Continuities and discontinuities in cultural conditioning. *Psychiatry Interpersonal & Biological Processes, 1*(2), 161-167. doi:10.1080/00332747.1938.11022182

Bialosiewicz, S., Murphy, K., & Berry, T. (2013). *An introduction to measurement invariance testing: resource packet for participants*. Washington, DC: American Evaluation Association.

Brandtstädter, J. (2009). Goal pursuit and goal adjustment: Self-regulation and intentional self-development in changing developmental contexts. *Advances in Life Course Research, 14*(1-2), 52-62. doi: 10.1016/j.alcr.2009.03.002

Breen, R., & Jonsson, J. O. (2005). Inequality of opportunity in comparative perspective: Recent research on educational attainment and social mobility. *Annu. Rev. Sociol., 31*, 223-243. doi: 10.1146/annurev.soc.31.041304.122232

Chow, A., Eccles, J. S., & Salmela-Aro, K. (2012). Task-value profiles across subjects and aspirations to physical and it-related sciences in the United States and Finland. *Developmental Psychology, 48*(6), 1612-1628. doi:10.1037/a0030194

Eccles, J. S. (1999). The development of children ages 6 to 14. *The Future of Children WHEN SCHOOL IS OUT, 9*(2), 30-44. https://www.jstor.org/stable/1602703.

Eccles, J. (2009). Who am I and what am I going to do with my life? Personal and collective identities as motivators of action. *Educational Psychologist, 44*(2), 78-89. doi:10.1080/00461520902832368

Eccles, J., Midgley, C., Wigfield, A., Buchanan, C. M., Reuman, D., Flanagan, C., & Mac Iver, D. (1993). Development during adolescence: The impact of stage-environment fit on

young adolescents' experiences in schools and in families. *American Psychologist, 48*(2), 90-101. doi:10.1037/10254-034

Eccles, J. S., & Wigfield, A. (1995). In the mind of the actor: the structure of adolescents' achievement task-values and expectancy related beliefs. *Personality and Social Psychology Bulletin, 21*(3), 215-225. doi:10.1177/0146167295213003

Gaspard, H., Dicke, A.-L., Flunger, B., Schreier, B., Häfner, I., Trautwein, U., & Nagengast, B. (2015). More value through greater differentiation: Gender differences in value beliefs about math. *Journal of Educational Psychology, 107*(3), 663-677. http://dx.doi.org/10.1037/edu0000003

Gaspard, H., Wigfield, A., Jiang, Y., Nagengast, B., Trautwein, U., & Marsh, H. W. (2018). Dimensional comparisons: How academic track students' achievements are related to their expectancy and value beliefs across multiple domains. *Contemporary Educational Psychology, 52*, 1-14. doi:https://doi.org/10.1016/j.cedpsych.2017.10.003

Gniewosz, B., Eccles, J. S., & Noack, P. (2015). Early Adolescents' Development of Academic Self-Concept and Intrinsic Task-value: The Role of Contextual Feedback. *Journal of Research on Adolescence, 25*(3), 459-473. doi:10.1111/jora.12140

Gniewosz, B., & Watt, H. M. (2017). Adolescent-perceived parent and teacher overestimation of mathematics ability: Developmental implications for students' mathematics task-values. *Developmental psychology, 53*(7), 1371. doi: 10.1037/dev0000332

Hidi, S., & Renninger, K. A. (2006). The four-phase model of interest development. *Educational Psychologist, 41*(2), 111-127. doi:10.1207/s15326985ep4102_4

Jacobs, J. E., Lanza, S., Osgood, D. W., Eccles, J. S., & Wigfield, A. (2002). Changes in children's self-competence and values: Gender and domain differences across grades one through twelve. *Child Development, 73*(2), 509-527.

Kallio, J. M., Kauppinen, T. M., & Erola, J. (2016). Cumulative socio-economic disadvantage and secondary education in Finland. *European Sociological Review*, *32*(5), 649-661. doi: 10.1093/esr/jcw021.

Kyndt, E., Coertjens, L., van Daal, T., Donche, V., Gijbels, D., & Van Petegem, P. (2015). The development of students' motivation in the transition from secondary to higher education: A longitudinal study. *Learning and Individual Differences, 39*(1), 114-123. doi:https://doi.org/10.1016/j.lindif.2015.03.001

Mac Iver, D., Klingel, D. M., & Reuman, D. A. (1986, April). *Students' decision-making congruence in mathematics classrooms: A person-environment fit analysis*. Paper presented at the meeting of the American Educational Research Association, San Francisco, CA.

Marshall, A. E., & Butler, K. (2015). School-to-work transitions in emerging adulthood. In J. J. Arnett (Ed.), The Oxford Handbook of Emerging Adulthood (pp. 316-333). Oxford, UK: Oxford University Press. ISBN: 9780199795574

Niemivirta, M. (2002). Motivation and performance in context: The influence of goal orientations and instructional setting on situational appraisals and task performance. *Psychologica, 45*(4), 250-270. doi: 10.2117/psysoc.2002.250

Ning, L., & Luo, W. (2017). Specifying Turning Point in Piecewise Growth Curve Models: Challenges and Solutions. *Frontiers in Applied Mathematics and Statistics*, *3*(1), 1-19. doi: 10.3389/fams.2017.00019

Piaget, J. (1972). *The principles of genetic epistemology*. London: Routledge & Kegan Paul.

Salmela-Aro, K., Kiuru, N., & Nurmi, J.-E. (2008). The role of educational track in adolescents' school burnout: A longitudinal study. *British Journal of Educational Psychology*, *78*(4), 663-689. doi:10.1348/000709908X281628

Salmela-Aro, K., Kiuru, N., Leskinen, E., & Nurmi, J.-E. (2009). School burnout inventory (SBI): Reliability and validity. *European Journal of Psychological Assessment, 25*(1), 48-57.

Schoon, I., & Ng-Knight, T. (2017). Co-development of educational expectations and effort: their antecedents and role as predictors of academic success. *Research in Human Development, 14*(2), 161-176. doi:10.1080/15427609.2017.1305808

Shernoff, D. J., Kelly, S., Tonks, S. M., Anderson, B., Cavanagh, R. F., Sinha, S., & Abdi, B. (2016). Student engagement as a function of environmental complexity in high school classrooms. *Learning and Instruction*. doi:http://dx.doi.org/10.1016/j.learninstruc.2015.12.003

Symonds, J., Dietrich, J., Chow, A., & Salmela-Aro, K. (2016). Mental health improves after transition from comprehensive school to vocational education or employment in England: A national cohort study. *Developmental Psychology*, *52*(4), 652-665. doi:10.1037/a0040118

Symonds, J., & Hargreaves, L. (2016). Emotional and motivational engagement at school transition: a qualitative stage-environment fit study. *The Journal of Early Adolescence, 36*(1), 54-85. doi: 10.1177/0272431614556348

Wang, M.-T., Chow, A., Degol, J. L., & Eccles, J. S. (2017). Does everyone's motivational beliefs about physical science decline in secondary school?: Heterogeneity of adolescents' achievement motivation trajectories in physics and chemistry. *Journal of Youth and Adolescence, 46*(8), 1821-1838. doi:10.1007/s10964-016-0620-1

Wang, M.-T., Chow, A., & Amemiya, J. (2017). Who wants to play? Sport motivation trajectories, sport participation, and the development of depressive symptoms. *Journal of Youth and Adolescence, 46*(9), 1982-1998. doi:10.1007/s10964-017-0649-9

Widaman, K. F., Ferrer, E., & Conger, R. D. (2010). Factorial invariance within longitudinal structural equation models: measuring the same construct across time. *Child Development Perspectives, 4*(1), 10-18. doi:10.1111/j.1750-8606.2009.00110.x

Watt, H. M. (2004), Development of adolescents' self- perceptions, values, and task perceptions according to gender and domain in 7th- through 11th- grade Australian students. *Child Development*, 75: 1556-1574. doi:10.1111/j.1467-8624.2004.00757.x

Willis, P. (1977). *Learning to labour: how working class kids get working class jobs*. New York: Columbia University Press.

Wigfield, A., & Eccles, J. S. (2000). Expectancy-value theory of achievement motivation. *Contemporary Educational Psychology, 25*(1), 68-81. doi:10.1006/ceps.1999.1015

Yli-Piipari, S., Jaakkola, T., Liukkonen, J., & Nurmi, J. E. (2013). The effect of physical education students' beliefs and values on their physical activity: A growth mixture modelling approach. *International Journal of Sport and Exercise Psychology, 11*(1), 70-86. doi:10.1080/1612197X.2012.731191

Zoller Booth, M., & Gerard, J. M. (2014). Adolescents' stage-environment fit in middle and high school: the relationship between students' perceptions of their school and themselves. *Youth and Society, 46*(6), 735-755. doi:10.1177/0044118X12451276

Tables and Figures

Table 1. Repurposed and original task-value items

Current study	**Eccles & Wigfield, 1995**
Disinterest (*M* α = .67)	***Intrinsic value*** (α = .76)
Studying/working is boring. I feel I am losing interest in studying/working.	In general, I find working on math assignments (very boring, very interesting). How much do you like doing math?
Attainment (*M* α = .86)	***Attainment value*** (α = .70)
An important goal for me is to do well in my studies/work. My goal is to succeed at school/work. To acquire new knowledge is an important goal for me in school/work. An important goal for me in my studies/work is to learn as much as possible.	Is the amount of effort it will take to do well in math worthwhile to you? I feel that, to me, being good at solving problems which involve math (is not at all important, very important). How important is it to you to get good grades in math?
Futility (*M* α = .70)	***Utility value*** (α = .62)
I feel that studying and going to school/work are useless. I think going to school/work is a waste of time. I constantly ask myself whether attending school/work has any meaning.	How useful is learning math for what you want to do after you graduate? How useful is what you learn in math for your daily life outside school?
Inertia (*M* α = .79)	***Required effort (cost)*** (α = .78)
I am particularly satisfied if I don't have to work much for my studies. I try to get away with making as little effort as possible with my schoolwork. I always try to do no more schoolwork than I have to.	How hard would you have to try to do well in math? How hard do you have to study for math tests to get a good grade? To do well in math I have to work (much harder in math than in other subjects, much harder than in other subjects than in math)

Table 2. Descriptive statistics

	N	Mean	SD
Futility age 15	701	2.06	1.09
Futility age 16	734	1.94	1.01
Futility age 17	622	1.85	0.91
Futility age 19	533	1.77	0.91
Futility age 22	531	1.83	1.01
Attainment value age 15	700	4.08	1.12
Attainment value age 16	733	4.28	1.09
Attainment value age 17	623	4.30	1.02
Attainment value age 19	533	4.53	1.05
Attainment value age 22	534	4.69	1.08
Disinterest age 15	702	2.99	1.37
Disinterest age 16	734	2.67	1.23
Disinterest age 17	624	2.70	1.22
Disinterest age 19	534	2.16	1.12
Disinterest age 22	534	2.22	1.22
Inertia age 15	700	3.47	1.29
Inertia age 16	733	3.41	1.24
Inertia age 17	622	3.39	1.32
Inertia age 19	533	2.73	1.29
Inertia age 22	534	2.63	1.24
Female	870	0.48	0.50
Parental employment	818	3.08	0.83
Self-reported grades age 15	642	8.02	0.81
Self-reported grades age 17	784	8.06	0.81
Academic track age 17	858	0.60	0.49
University age 22	596	0.28	0.45
Polytechnic age 22	596	0.23	0.42
Vocational school age 22	596	0.07	0.25
Working age 22	596	0.36	0.48
Other occupation age 22	596	0.42	0.49

Table 3. Confirmatory factor analyses model fit indices

	W1	W2	W3	W4	W5
Observations	702	734	625	534	535
χ^2	368.525	292.117	252.127	253.851	278.923
df	47	45	47	47	46
p	0.000	0.000	0.000	0.000	0.000
RMSEA	0.10	0.09	0.08	0.09	0.10
CFI	0.906	0.932	0.936	0.934	0.935

Table 4. PGCM model fit indices

	Futility	Attainment	Disinterest	Inertia
Observations	876	876	876	876
χ^2	469.470	664.291	250.838	494.543
df	159	257	73	159
p	0.000	0.000	0.000	0.000
RMSEA	0.049	0.044	0.055	0.056
CFI	0.900	0.947	0.901	0.917

Table 5. PGCM Futility

		M	SE	t	p
	Intercept	-3.72	0.51	-7.36	0.000
	MST	-0.08	0.03	-2.27	0.023
	STWT	-0.07	0.03	-2.39	0.017
		b	SE	t	p
Intercept	Female	-0.26	0.05	-5.56	0.000
	Parental employment	0.07	0.05	1.43	0.153
	Grades	-0.47	0.08	-5.95	0.000
	Vocational	-0.09	0.07	-1.37	0.170
MST	Female	0.04	0.25	0.17	0.865
	SES	-0.08	0.34	-0.24	0.807
	Grades	0.77	0.34	2.24	0.025
	Vocational	0.32	0.34	0.94	0.346
STWT	Female	0.16	0.09	1.72	0.086
	SES	0.01	0.11	0.10	0.922
	Grades	0.12	0.12	1.01	0.313
	Vocational	-0.07	0.07	-0.91	0.363

Table 6. PGCM Attainment

		M	SE	t	p
	Intercept	4.09	0.85	4.82	0.000
	MST	0.03	0.05	0.55	0.583
	STWT	0.16	0.04	4.58	0.000
		b	SE	t	p
Intercept	Female	-0.01	0.04	-0.32	0.747
	Parental employment	-0.14	0.04	-3.20	0.001
	Grades	0.57	0.08	7.22	0.000
	Vocational	0.09	0.06	1.45	0.146
MST	Female	0.38	0.18	2.12	0.034
	SES	0.27	0.10	2.60	0.009
	Grades	-0.07	0.16	-0.41	0.680
	Vocational	-0.53	0.31	-1.74	0.083
STWT	Female	-0.01	0.10	-0.06	0.950
	SES	0.05	0.08	0.61	0.539
	Grades	-0.30	0.10	-3.14	0.002
	Vocational	0.14	0.07	2.04	0.041

Table 7. PGCM Disinterest

		M	SE	t	p
	Intercept	-2.36	0.29	-8.02	0.000
	MST	-0.11	0.04	-2.91	0.004
	STWT	-0.17	0.03	-5.44	0.000
		b	SE	t	p
Intercept	Female	-0.06	0.02	-2.64	0.008
	Parental employment	0.14	0.03	4.43	0.000
	Grades	-0.54	0.08	-7.21	0.000
	Vocational	-0.02	0.06	-0.32	0.751
MST	Female	-0.15	0.06	-2.52	0.012
	SES	-0.22	0.08	-2.85	0.004
	Grades	0.41	0.16	2.58	0.010
	Vocational	0.37	0.13	2.91	0.004
STWT	Female	0.23	0.08	2.86	0.004
	SES	0.13	0.10	1.36	0.174
	Grades	0.03	0.14	0.23	0.822
	Vocational	-0.21	0.08	-2.78	0.006

Table 8. PGCM Inertia

		M	SE	t	p
(standardized)	Intercept	-1.88	0.38	-4.99	0.000
	MST	-0.05	0.05	-0.85	0.394
	STWT	-0.39	0.03	-11.76	0.000
		b	SE	t	p
Intercept	Female	-0.14	0.04	-4.09	0.000
	Parental employment	0.09	0.04	2.21	0.027
	Grades	-0.23	0.07	-3.50	0.000
	Vocational	-0.07	0.07	-1.05	0.295
MST	Female	-0.18	0.13	-1.37	0.169
	SES	0.05	0.15	0.32	0.749
	Grades	-0.24	0.11	-2.15	0.031
	Vocational	0.67	0.09	7.06	0.000
STWT	Female	0.60	0.36	1.69	0.090
	SES	0.22	0.63	0.35	0.727
	Grades	0.82	0.51	1.62	0.105
	Vocational	-0.47	0.60	-0.79	0.431

Figure 1. Futility

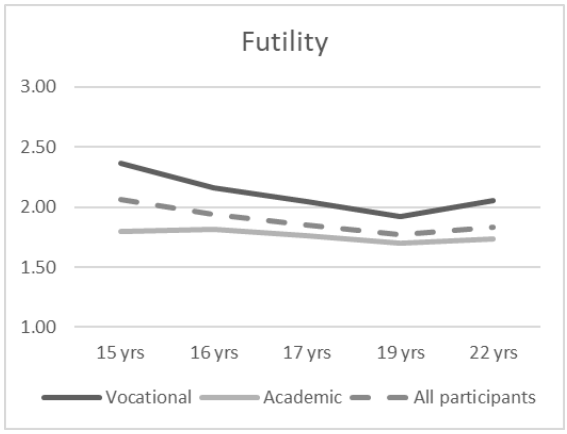


Figure 2. Attainment

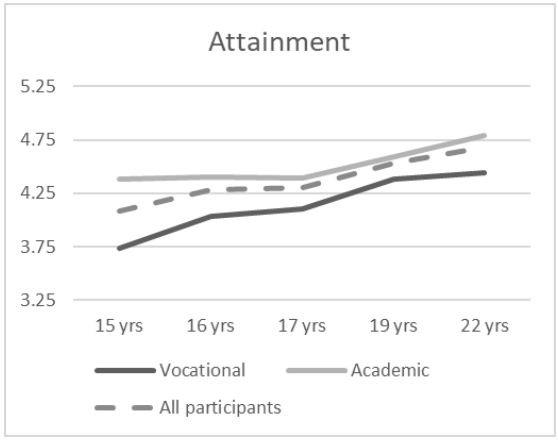


Figure 3. Disinterest

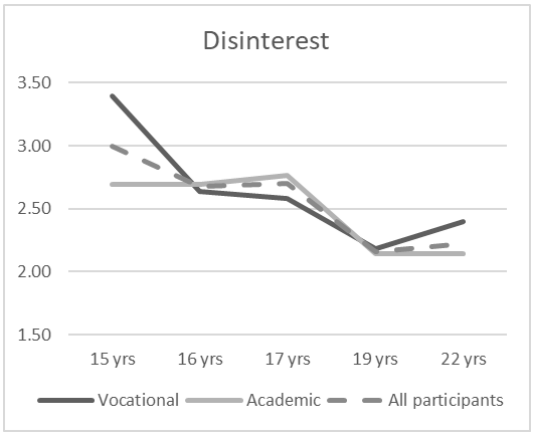
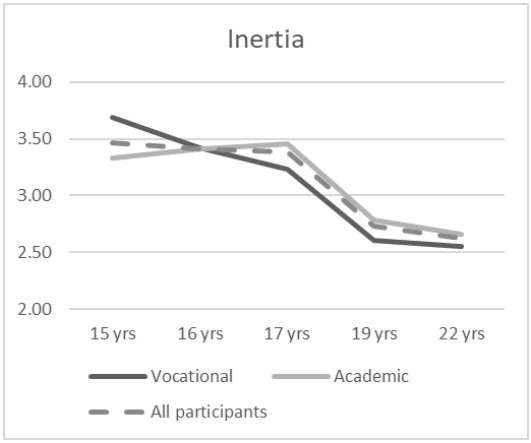


Figure 4. Inertia



The Development of Young People's Motivation to Study and Work Across the Mid-Schooling and School-to-Work Transitions

Acknowledgements

Acknowledgements: None

Declarations of interest: None

Funding: This work was supported by the Jacobs Foundation (Pathways to Adulthood) and the Academy of Finland