

The role of cognitive tests and teachers in the transition from primary to secondary education

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Valorisation

The transition from primary to secondary education

A good transition between the different stages of education contributes to an optimal development of children's human capital. Children as well as society in general benefit when investments in education are optimized and when all children use their potential to the fullest and smoothly move through the education system. This is likely to reduce retention rates, mismatches in study choices and on the labour market, and early school dropout rates. Switches and early dropout in children's educational career are inefficient and expensive. Therefore, in general, the decisions made regarding children's transition from primary to secondary education are high stakes for all parties involved.

In many countries, such as in the Netherlands, the transition from primary to secondary education is an important educational decision because children are placed into tracks based on their performance and expected ability. School tracks include both the type (more practical vs. more theoretical) and the level of education (vocational, general or academic). The educational track to which children are allocated to has important consequences for their future schooling career (Hanushek and Woessmann, 2006; Inspectorate of Education, 2014; Timmermans et al., 2013). The educational track in secondary education is a determinant for future school education as well as for labour market possibilities.

In addition, in the Netherlands, the decision is made at a rather early age, i.e. the age of 12. In an education system that uses early tracking it is essential to understand the determinants of track placement and their relation to children's further school career. The Dutch education system, offers an opportunity to investigate the relation between the teacher's assessment, the test score, track placement, track switching, and other measures of performance such as grades and motivation. These topics are at the core of this dissertation.

Relation between research, schools and policy⁷⁷

The data that is used in this dissertation is collected as part of a project called Educatieve Agenda Limburg. This project is a collaboration between Maastricht University, school boards (primary, secondary and tertiary) and government bodies in Limburg (a province in the South of the Netherlands). The goal of this project is to improve education by means of increased networks for dialogue, innovative studies, monitoring and research. An important instrument for this is extensive data collection in the OnderwijsMonitor Limburg (OML). The OML aims to gain insight into the educational devel-

⁷⁷ The OnderwijsMonitor Limburg, 2018, De educatieve agenda Limburg. <http://educatieveagendalimburg.nl/onderwijsmonitor-p/english>

opment of children in order to pursue the further improvement of education and to acquire knowledge about the dynamics of educational processes in general.

The starting point of the OML is information which is already collected within schools. Additional testing and surveying is done where needed, in close collaboration with the schools. Data are collected at different ages, e.g. age of 6 (1st grade), 12 (6th grade) and 15 (9th grade). The data include administrative data from the school information systems, surveys among children and their parents, test results and teachers' assessments. In this way information is acquired about students' test scores, socio-economic background, personality, social-emotional wellbeing, social and academic skills and school attitude. The data covers children from all tracks with the exception of those who are in special needs education. This combination of data collection at different ages provides a unique dataset about the educational development of children in Limburg. Almost all schools in the region have participated in the data collection process. Approximately 95 percent of all primary schools and 90 percent of all secondary schools have participated in the data collection process. The unique feature of the data used in this dissertation is that these children are followed over time as they progress from 6th to 9th grade.

The data in the OML is collected in ongoing dialogue with teachers, school leaders and policy makers about school performance and development. As a part of the data collection effort, the researchers working with the data identified important educational challenges among which track switching, the influence of the test score and the teacher's assessment on children's outcomes and children's motivation in relation to underperformance. They have expressed a need to know more about these topics in the context of their schools and the children attending their schools. These challenges are addressed in this dissertation from a scientific point of view, but clearly arise from the school practice.

The OML is used at different levels:

- feedback for school on their educational performance, in relation to other schools in the regions and schools with a similar student population
- regional analyses on education and the identification of important challenges, such as language problems or early school dropout.
- research (both academic and applied) on educational questions and dissemination of insights into the domains of academia, policy and educational practice.

With the studies in this dissertation, a contribution is made on all three of these domains. Not only did the topics in this dissertation arise from school practice, the analyses are, where possible, used in the school feedback. This school feedback allows school boards and schools to adjust their policies and to measure and evaluate the effects of educational policies and practices. For example, the predictive value of test scores and the teacher's advice, and the switching rates in secondary education are also calculated at the school-levels and included in the digital reports that the schools re-

ceive. As a result of this feedback, some schools identified the reduction in the switching between educational tracks as an important strategic goal for the upcoming years. Teachers with a research component in their job were appointed to analyse this in more detail. In a professional learning community these teachers joined forces with researchers of Maastricht University to analyse the data and interpret the findings. The results from this dissertation were an important input in this process.

Second, the results of the dissertation are used to present some regional analyses on the transition from primary to secondary education. Figures are presented on the website⁷⁸ and were presented at various occasions in the region. Children are free to choose their school in the Netherlands and secondary schools might use different rules and procedures with respect to the placement in the first year of secondary education. Each school has its own policy on accepting students based on the test score and the teacher's recommendation, and possible additional instruments (e.g. iq test or personality test). Some schools have a reputation of being strict, while others are perceived to be lenient towards students with lower scores and willing to 'offer chances to all'. Regional agreements can also be in place. It is therefore important to look at regional differences, also to understand regional mismatches in tertiary education or differences in unused potential of students.

Third, the dissertation clearly contributes to the scientific research on important educational questions. It adds to the literature and understanding about how to measure the educational development of children. The different papers in this dissertation all contain information that is valuable for schools to know in their ongoing effort to improve children's educational outcomes such as allocating children to the most appropriate track, switching between tracks and children's motivation to perform well in school. Results are translated into scientific papers and presented at both academic and policy-oriented conferences.

Apart from the direct valorisation to school practice and policy arising from the data used, another important valorisation aspect stems from the field experiment. The mere topic of motivation and underperformance was the result of continued dialogue with teachers in secondary schools. Already at the set-up of the intervention, the cooperation between teachers, school leaders and researchers was intensive. First, a pilot-intervention was developed with two schools. This pilot proved to be very useful for the actual experiment. First, we learned that designing an experiment in cooperation with schools results in a better understanding of the experimental design by schools and creates more willingness for schools and teachers to participate in the experiment. In addition, when schools and teachers understand the benefit of an experiment they are better able to translate this to their students. Second, intensive communication with schools is crucial for the proper execution of the experiment. This has an effect both on

⁷⁸ <http://educatieveagendalimburg.nl/limburg-cijfers/cijferpagina/schooladvies-en-positie-de-derde-van-de-middelbare-school>

the logistic feasibility of the experiment but also on the accuracy of the effect measurement. Finally, the pilot contributed to the creation of the tasks that are used in the experiment. Parts of the content as well as the language used in the tasks was adjusted based on the feedback we received. To ensure that the tasks were suitable for the target group they were adjusted by a secondary school student as part of a school assignment. This student was in 11th grade in the pre-university track.

18 schools participated in the actual intervention study. The intervention showed that it is not enough to have the support of the school boards if the teachers supporting the intervention on a daily basis do not have the time to execute it properly. This is important information for school leaders who strive to work in an evidence-based manner. Reliance on intervention studies is important, but for successful interventions teachers need to be included in the process.

After the intervention study, the assignments used in the interventions, were made freely available to all schools who participated in the intervention study (also control schools). Schools were free to use these assignments to try to improve motivation of children in their school. A number of schools have told us that they would like to use the materials as they believed the children in their school could benefit.

Results of this dissertation

These findings have implications for different parties. Concerning the choice of a secondary school both children and parents will benefit from a realistic assessment of children's ability. Children (and parents) benefit from the test as an assessment measure as it gives an objective assessment of their ability level independent from their other characteristics. The results show that the teacher's assessment is a better predictor of children's ability. This is because other skills such as personality traits are also needed to perform well in secondary school. At the same time the results show that the teacher seems to weigh in children's background characteristics when giving an assessment, such as children's social-economic background. Even though the allocation of children to tracks based on the teacher's assessment seems to be more efficient as it leads to a higher investment in human capital, there is also a trade-off with equal opportunities.

These studies also give an insight into the assessment process as done by teachers. The teacher uses different information compared to the test (e.g. children's classroom behaviour) but teachers also use similar information (e.g. children's cognitive performances) but the information is weighted in a different way in the teacher's assessment, compared to the test. The finding that the teacher uses the information obtained from a test to adjust children's assessment heterogeneously across different groups is important for teachers to be aware of. The differences in adjustments can be the consequence of a realistic assessment based on new information or stereotyping.

The studies also provide information about the selection and allocation process during the transition from primary to secondary education. Schools gain insight into the potential consequences of their own policies and choices made at the beginning of children's educational career. Schools for primary education gain insight into their adequacy of assessing children's ability level and schools for secondary education gain insight into how their children switch between tracks during their school career compared to the teacher's assessment and the initial track allocation. Society gains insight into the determinants that can result in a higher investment in human capital and the potential consequences for equal opportunities.

The field experiment shows how difficult it is to target underperforming children with a school intervention. This study focused on children who in 9th grade perform at a lower level compared to their expected performance in 6th grade. These children could, arguably, benefit from interventions aimed at improving their motivation and performance. However, as they are not motivated to perform well in school they are also less likely to successfully participate in these kind of policy interventions. This study shows the importance of school support for this type of research. Without specifically targeting these children and without support from teachers and school staff it is difficult for outside researchers to successfully perform interventions.