Assessing the added value of the self-system model of motivational development in explaining school engagement among students at risk of early leaving from education and training

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Abstract:	Tackling early leaving from education and training (ELET) is one of the headline targets for education policy in the European Union. Although ELET rates have been decreasing in most member states, male, socially disadvantaged and immigrant students remain overrepresented in ELET figures. Moreover, students in vocational tracks and students who experienced grade retention are steadily more at risk of ELET. These risk factors are, however, considered mostly beyond the reach of individual educators. This study therefore targets to pinpoint more alterable factors that can support at-risk students' educational resilience. As there is broad scientific consensus to consider ELET as a potential endpoint of a gradual process of disengagement from school, this study explores the added value of the self-system model of motivational development (SSMMD) in explaining behavioural school engagement and disaffection among students considered at risk of ELET based on their sociodemographic and educational background characteristics. We make use of data from a longitudinal survey purposefully collecting data from 483 students across 25 inner-city vocational secondary schools in Flanders. The Structural Equation Modelling (SEM) testing the hypothesised structural relations of the SSMMD, overall, showed empirical support for the model being an interesting theoretical framework for explaining student (dis)engagement through perceived social support and self-processes. The SEM, however, also showed a few relations contradicting the theoretical hypotheses. We discuss how the hierarchically tracked and segregated educational context in Flemish urban vocational schools could provide explanations for these findings.
Response to Reviewers:	Ms. Ref. No.: EUPE-D-19-00234R1 - List of responses to reviewer comments

	2.1. Major comments: *The authors do not convince the reader about the proposed model has a goodness of fit. Thus, the reader is unconvinced about it, because of the unreported important indices such as GFI, AGFI, PGFI, RMR. Surprisingly, the authors mentioned that AMOS package does not calculate such indices. It is necessary to eliminate the doubts that this incorect idea puts into the minds of readers. These indices are not reported in the AMOS Output in the case are estimated means and intercepts. Thus, a defeansible modality of computing the fit statistics consists in leaving the means and intercepts aut of the measure (in the Analysis Properties option). So, statistics processing will be based on the observed variances and the implied variances matrix. It is accepted in the literature that is an obviously correct way of calculating the conventional formulas for GFI, AGFI, PGFI, and RMR. Response: We were pleased to learn that the Goodness of Fit statistics (GFI, AGFI) can in fact by calculated in AMOS when leaving the 'estimate means and intercepts' box unchecked in the Analysis Properties. The Goodness of Fit statistics GFI and AGFI have now been added and addressed in the manuscript. Without estimating the means and intercepts, the previously reported model fit statistics, as well as the regression weights and standard errors in the measurement and structural models only slightly changed and still meet the criteria that were upheld in the previous version of the manuscript. The changes can be easily checked by comparing the tables in the new and previous manuscript. *The psychometric properties of the SEM model (in fact, more correctly, a path analysis) it is an important aspect. According to Hu and Bentler (1999), the cut off criterion for SRMR is around .08, but authors reported a huge value (.637) - revealing a very poor goodness of fit. More than that, the authors mentioned on the page 10 that cut off criterion is 0.8 - instead of 0.08. The reader has a blury and confusing image about the corectedness of the statistical measures. Response: The SRMR value and threshold value were indeed written down incorrectly. Both were missing a zero after the decimal sign (i.e. SRMR= 0.0637; threshold 0.08). We can therefore understand how this honest but important mistake lead the reviewer to state that the reader is left with a blurry and confusing image about the correctness of the fit measures. 2.2. Minor comments: *The confidence interval mentioned for the RMSEA (page 9) seems to have a too small range Response: Although the RMSEA value slightly changed by unchecking the estimate means and intercepts box, the range of the interval did not really change much. * It is not mentioned enough information related to the measurement invariance of the research scale Response: We added the information we could find on the measurement invariance of the previously validated research scales. We feel that performing the measurement invariance testing ourselves would add too much additional analyses and findings to the article that is already close to the maximum length. *I would like to see a stronger rationale for the counterfactual findings obtained. Based on them, could be envisaged more future research topics. Response: We have added some clear paths for future research on how to test the hypotheses we have put forward on the reasons on why some findings differed from what was hypothesised based on the theory we deducted from other research on an educationally tracked secondary education system (such as in Flanders).

Author information page

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Current themes in the field of Psychology of Education
Current research focuses on motivation and engagement in studying educational trajectories and outcomes of vulnerable youth. Various projects study these themes in full-time school-based and part-time work-based vocational education settings.

Most relevant publications in the field of Psychology of Education:

Nouwen, W., Van Caudenberg, R., & Clycq, N. (2019). The role of religiosity in students' perceptions of student-teacher relations, school belonging and valuing of education. In *Radicalisation: a marginal phenomenon or a mirror of society?,* Clycq, N., Timmerman, C., Vanheule, D., Van Caudenberg, R. & Ravn, S. (eds.). Leuven: Leuven University Press, pp. 117-152.

Van Praag, L., Nouwen, W., Van Caudenberg, R., Clycq, N., & Timmerman, C. (Eds.). (2018). Comparative perspectives on early school leaving in the European Union. Routledge, DOI: https://doi.org/10.4324/9781315170404

Van Praag, L., Van Caudenberg, R., Nouwen, W., Clycq, N. & Timmerman, C. (2017). How to support and engage students in alternative forms of education and training? A qualitative study of school staff members in Flanders, *Journal of Education and Work*, 30(6): 599-611, DOI: 10.1080/13639080.2017.1319567

Nouwen, W., & Clycq, N. (2016). The Role of Teacher–Pupil Relations in Stereotype Threat Effects in Flemish Secondary Education. *Urban Education*. https://doi.org/10.1177/0042085916646627

Clycq, N., Ward Nouwen, M. A. & Vandenbroucke, A. (2014). Meritocracy, deficit thinking and the invisibility of the system: Discourses on educational success and failure. *British Educational Research Journal*, 40 (5):796-819. doi:10.1002/berj.3109

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Current themes in the field of Psychology of Education

Research focuses on (ethnic) diversity, identity formation, educational (in)equality and teachers. Various projects study the socialization role of formal and informal education and the interplay between agency and structure in the lives and trajectories of vulnerable youth.

Most relevant publications in the field of Psychology of Education:

Nouwen, W., Van Caudenberg, R., & Clycq, N. (2019). The role of religiosity in students' perceptions of student-teacher relations, school belonging and valuing of education. In *Radicalisation: a marginal phenomenon or a mirror of society?,* Clycq, N., Timmerman, C., Vanheule, D., Van Caudenberg, R. & Ravn, S. (eds.). Leuven: Leuven University Press, pp. 117-152.

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Clycq, N. (2017). 'We value your food but not your language': Education systems and nation-building processes in Flanders. *European Educational Research Journal*, 16(4): 407–424. https://doi.org/10.1177/1474904116668885

Nouwen, W., & Clycq, N. (2016). The Role of Teacher–Pupil Relations in Stereotype Threat Effects in Flemish Secondary Education. *Urban Education*. https://doi.org/10.1177/0042085916646627

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Assessing the Added Value of the Self-System Model of Motivational Development in Explaining School Engagement among Students at risk of Early Leaving from Education and Training

Abstract

Tackling early leaving from education and training (ELET) is one of the headline targets for education policy in the European Union. Although ELET rates have been decreasing in most member states, male, socially disadvantaged and immigrant students remain overrepresented in ELET figures. Moreover, students in vocational tracks and students who experienced grade retention are steadily more at risk of ELET. These risk factors are, however, considered mostly beyond the reach of individual educators. This study therefore targets to pinpoint more alterable factors that can support at-risk students' educational resilience. As there is broad scientific consensus to consider ELET as a potential endpoint of a gradual process of disengagement from school, this study explores the added value of the self-system model of motivational development (SSMMD) in explaining behavioural school engagement and disaffection among students considered at risk of ELET based on their sociodemographic and educational background characteristics. We make use of data from a longitudinal survey purposefully collecting data from 483 students across 25 inner-city vocational secondary schools in Flanders. The Structural Equation Modelling (SEM) testing the hypothesised structural relations of the SSMMD, overall, showed empirical support for the model being an interesting theoretical framework for explaining student (dis)engagement through perceived social support and self-processes. The SEM, however, also showed a few relations contradicting the theoretical hypotheses. We discuss how the hierarchically tracked and segregated educational context in Flemish urban vocational schools could provide explanations for these findings.

Introduction

Tackling early leaving from education and training (ELET)[1] is one of the headline targets for education policy in the EU 2020 Strategy of the European Commission (European Commission 2011). Building on and directly referring to the EU 2020 Education and Training Strategy, many member states implemented a strategy for reducing ELET (Authors 2015; Flemish Government 2015). Although the ELET rates in most member states have dropped since the introduction of the EU 2020 strategy, there remain large disparities between gender, social and

[1] ELET was initially developed as a statistical concept within the European Union (Eurostat) and is defined by youngsters age 18-24 that have left education or training without an upper secondary education diploma. As this study was part of a large-scale EU funded comparative research on Reducing Early School Leaving in Europe (RELET.eu Project), we will use this concept instead of school dropout (more commonly used in the US context, amongst other countries).

ethnic groups. EU monitoring of ELET has shown that in most EU member states male, socially disadvantaged and immigrant and ethnic minority students have a substantially higher risk of ELET (EU Commission 2018). Another imbalance in ELET figures concerns the higher ELET risk for students in vocational tracks (Eurydice & 'CEDEFOP 2014). The early tracking of students – which is characteristic for the Flemish educational system – has been shown to further increase the overrepresentation of disadvantaged groups in ELET rates (Lavrijsen & Nicaise 2015).

The aforementioned risk factors can be found throughout international literature on ELET (Lamb et al. 2011; Rumberger & Lim 2008) and their continuing impact shows how resistant these systematic features seem to be. They are, therefore, often described as rather fixed and beyond the reach of individual schools and teachers. Partly due to this robustness of systemic features and social inequalities in educational outcomes, studies on educational resilience increasingly focus on trying to explain the variance within at-risk groups (Agasisti et al. 2018; Christenson & Thurlow 2004). Educational resilience is defined as the capacity of students to overcome obstacles by being able to access and apply the various resources that are available to them (Ungar & Liebenberg 2013). These resources are not only personal traits but are also related to social context. This implies that studying educational resilience should take up a social-ecological perspective, embedding the emergence of resilience in the broader context (Quin, et al. 2018; Ungar & Liebenberg 2013). This leads us to the role of factors such as (perceived) social support, self-perceptions and school engagement (Christenson & Thurlow 2004).

From the perspective of educational resilience and ELET, school engagement – by which we, following the general literature on these topics, mean 'student engagement with school' – is a useful concept that tries to capture the process of how interrelated cognitive, emotional and behavioural dimensions of engagement can predict educational outcomes (Fredricks et al. 2004; Janosz et al. 2008; Lam et al. 2016; Wang et al. 2011). The school engagement construct is used for understanding the gradual process by which students disconnect from school and is therefore consistent with the idea that ELET is mostly not an event that happens out of the blue, but is rather an endpoint of a process of disengagement that occurs over time (Finn 1989). In contrast to more fixed risk factors, early signs of disengagement allow for intervention from schools and educational professionals. School engagement is a useful concept for educational resilience because it shifts attention to alterable variables to prevent ELET (Appleton et al. 2008; Christenson et al. 2001; Christenson & Thurlow 2004). Therefore, to be able to intervene in a process of gradual disengagement – potentially preventing ELET – requires a good understanding of the make-up and antecedents of the school engagement construct.

Although the adequacy of the school engagement construct is broadly acknowledged for being a useful concept in the prevention of ELET (Lamote et al. 2013; Lam et al. 2016; Rothermund 2010), there is still significant debate about the dynamics of its specific dimensions, as well as to its antecedents in students' social context and relations to other self-perceptions (Appleton et al. 2008). We therefore build upon the theory of the Self-System Model of Motivational Development (SSMMD) as it purposely embeds students' school engagement in a broader motivational framework and connects students' engagement to antecedents in their social context and self-system processes (Skinner & Belmont 1993; Skinner et al. 2008).

In an effort to pinpoint more alterable factors that can help to tackle ELET and thus support education resilience, this study explores the relations between students perceived social support, self-system processes and behavioural school engagement, as hypothesised by the SSMMD. We make use of a sample from a longitudinal survey purposefully collecting data from students in inner-city vocational secondary schools in the two largest Flemish cities, *i.e.* Antwerp and Ghent. This study is the first to extent hypotheses testing based on the SSMMD to a Western European context that is characterised by an overrepresentation of lower SES and immigrant students in vocational tracks, grade retention and ELET figures (Flemish Department of Education and Training 2019).

Theoretical Background

A critical concept in studies on alterable factors for tackling ELET among at-risk students is the concept of school engagement (Christenson et al. 2001; Christenson & Thurlow 2004; Lam et al. 2016). School engagement, however, is in itself a multidimensional and dynamic concept that combines observable indicators of positive and negative behavioural engagement (e.g. sustained attention, completion of study tasks, number of suspensions) with more covert emotional and cognitive engagement dimensions that entail more internal indicators (e.g. sense of school belonging or the use of cognitive strategies) (Appleton et al. 2008; Fredricks et al 2004; Wang et al 2011). Moreover, school engagement does not operate independently from an individual student's social context, nor from psychological processes in relation to school (Skinner et al. 2008; Ungar & Liebenberg, 2013). To this framework one also needs to add the element of time, as disengagement from school – potentially leading to ELET – needs to be considered as a, long-term process (Finn 1989; Quin et al. 2018). This complexity is well captured by the Self-System Model of Motivational Development which provides a wider motivational framework connecting various contextual antecedents and psychological processes that can help to explain engagement in school (Connell & Wellborn 1991; Skinner et al. 1990).

Although school engagement theorists (*e.g.* Finn 1989; Fredricks et al. 2004) to some extent theorised the make-up and internal dynamics among the behavioural, emotional and cognitive dimensions of the school engagement construct, they did not capture how these engagement dimensions relate to other important personal and contextual resilience attributes such as perceived competence, autonomy or social support. Appleton et al. (2008) argue that the conceptualisations of engagement are consistent with theories on motivation, claiming that motivation is necessary but not sufficient for engagement. Whereas the concept of engagement captures one's active involvement in a task or domain, motivation theory is about why a person is engaged. By viewing (school) engagement in a motivational framework, one can theorise engagement in relation to underlying psychological processes and ongoing interactions with one's context. The Self-System Model of Motivational Development (SSMMD) has proven to be able to capture the intra-individual as well as the interindividual processes influencing school engagement (Connell & Wellborn 1991; Connell et al. 1994; Skinner et al. 2008).

The SSMMD comprehensively captures these processes leading to engagement or lack thereof, in motivation theory termed disaffection (Skinner & Belmont 1993; Skinner et al. 2008). The SSMMD is grounded in the self-system model (Connell and Wellborn 1991) and the self-determination theory (Deci & Ryan 1985). Both motivation theories build on the idea that individuals have the urge to satisfy three basic psychological needs of feeling competent, autonomous and related in order to be engaged in a certain domain (Connell & Wellborn 1991; Deci et al. 1991; Skinner et al. 1990). Whereas the further development of the SSMMD focused primarily on the self-system processes connecting social context, the self and engagement in a wider motivational framework, self-determination theory initially distinguished between intrinsic and extrinsic motivation, as well as between different regulatory styles within extrinsic motivation (as will be elaborated on in the next paragraph). Central to the self-system model is the idea that one's self-appraisal with regard to the level of competence and control in producing desired outcomes, as well as autonomy in and relatedness to a certain domain play a central role in the development of the self and therefore motivate one's engagement in a certain domain. These psychological processes are named self-system processes (Connell and Welborn 1991; Skinner et al. 1990).

Applied to the domain of education, perceived competence is described as feeling capable and knowing how to do well in school (Skinner et al. 1990). Secondly, perceived autonomy entails the assessment of students' self-regulatory styles regarding school activities, *i.e.* the way students experience the initiation, continuation and regulation of their engagement in education and the connection between one's engagement and their personal goals. In the psychological need of feeling autonomous we find the strong relation to the notion of self-determination. Intrinsically motivated students regulate their engagement in education the most autonomous,

namely by their enjoyment of it, while students who are motivated extrinsically are primarily engaged in education based upon factors external to personal enjoyment. While self-determination theorists (e.g. Deci & Ryan 1985) distinguish between different kinds of regulatory styles based on extrinsic motivation, in this study, we focus only on the most autonomous – and therefore most sustainable – form of extrinsically motivated regulation, namely identified regulation. Identified regulation is motivated by the perceived importance for one's personal future (Connell & Welborn 1991). A third important psychological need captured by the SSMMD concerns the need for feeling related, which entails to feel connected to others in school and to experience a sense of school belonging in order to be engaged in education (Connell and Welborn 1991).

Next to these underlying psychological processes, the SSMMD also views an individual's social context as facilitating or inhibiting for satisfying the psychological needs of feeling competent, autonomous and related. Self-system processes develop out of the ongoing interaction with an individual's social context and the level to which these interactions enable individuals to satisfy them. The most relevant types of support for the development of the self-system processes are providing structure and autonomy support, as well as showing involvement (Connell & Welborn 1991; Deci & Ryan 1985). Connell and Welborn (1991) translated these social context variables to education as follows: (1) structure support entails teachers and parents' communication of clear expectations for performance, consistent consequences, optimal challenge and positive performance feedback; (2) autonomy support refers to the amount of choice provided by teachers and parents in supporting students to connect their engagement to their own personal goals and values; and (3) the involvement of teachers and parents relates to their dedication of psychological resources by showing positive affection, *e.g.* spending time to help them to do better in school and showing interest in what happens in school.

The relations between context, self and engagement hypothesised by the SSMMD are strongly supported by empirical research (*e.g.* Furrer & Skinner 2003; Reeve et al. 2004; Skinner et al. 2008; De Loof et al., 2019). Vallerand et al. (1997), for instance, found that autonomy supporting teachers and parents increase students' perceived competence and autonomy and low levels of perceived autonomy increase dropout intentions, which in turn increased the actual likelihood of ELET. Rotermund (2010) found empirical support for a process model of dropout in which psychological factors such as sense of belonging, valuing school and perceived competence are precursors to school engagement, as well as school engagement being a mediator between the self and dropping out. Fall and Roberts (2012) also tested the relations hypothesised by the SSMMD, finding that students' perceptions of teacher and parental support predicts students' perceived control and identification with school, which in turn increased students' behavioural engagement and decreased the likelihood of dropout.

Present study: aims and research questions

Although there is strong empirical evidence supporting the SSMMD, to our knowledge, no studies have tested SSMMD hypotheses in a Western European student population with a high risk of ELET. In this paper we aim to move beyond fixed risk factors for ELET in students' social and educational background and shift the focus to explaining students' behavioural school engagement, a strong predictor of potential ELET. We therefore approach the phenomenon ELET as a potential endpoint of a gradual process of school disengagement and aim to show which social context and self-system factors can strengthen or hinder students' behavioural school engagement.

The purpose of the current study is to use structural equation modelling (SEM) to test the measurement model and structural relations hypothesised by SSMMD. To put it more concretely, we test (a) how perceived social support relates to self-system processes and behavioural engagement/disaffection, (b) how self-system processes relate to behavioural engagement and disaffection, and (c) to what extent the self-system processes impact the relations between social support and behavioural engagement/disaffection. Different than the studies testing the SSMMD hypotheses referred to in the previous paragraphs, this study distinguishes five different measurements of self-system factors, namely perceived competence and control, perceived autonomy measured by both intrinsic and identified regulation and, finally, the level of perceived relatedness. The student sample collected within urban vocational secondary schools in Flanders provides a unique setting to test these relations because of being situated in a hierarchically tracked educational context, which links to the omnipresence of sociodemographic and educational risk status indicators in the student population. In the next section we discuss our particular data sample and the methods used in the analyses.

Methods

Participants and procedure

This study is based on data from the first wave of a longitudinal survey administered in the spring of 2014 in the two largest Flemish cities, *i.e.* Antwerp and Ghent. The dataset includes 483 records of students in grade 10 and 12 of the school-based vocational track[2] across 25 different urban secondary schools. The criteria for the selection of schools were (1) being located in one of both urban areas and (2) for providing the vocational track. Due to the

[2] The general track primarily prepares students for higher education while the vocational track is directed towards labour market entry after graduation. Nonetheless students graduating from vocational secondary education have the option to start a higher education program. Next the general and vocational track, Flemish secondary education also provides a technical and an arts track that intent to prepare students for both higher education as well as direct labour market entry.

urban and vocational character of these schools, our sample holds a high representation of students who are considered to be at-risk of ELET based on having a low SES background, non-EU migration background and/or having experienced grade retention. All these risk factors are more common to urban vocational schools, in the hierarchically tracked school system in Flanders (Van Houtte & Stevens 2009). Student responses were recorded via an online or a paper-and-pencil survey administered with at least one of the researchers present.

Measures

All latent variables included in this study are adapted from previously validated scales. We discuss the measurement model of the SEM measuring the latent constructs for perceived social support, self-system factors and behavioural engagement and disaffection as part of the findings. In this section we only present the references, example items and the alpha values from the reliability testing of the constructs in the present study.[3] All scale items are scored on a five-point Lickert scale. Except for the behavioural disaffection items all scale items allowed for responses ranging from "completely disagree" to "completely agree". The behavioural disaffection scale had the following response options: "never"; "rarely"; "sometimes"; "quite often"; "very often". Most latent constructs are adapted from Wang et al. (2011) who showed that the measurements are measurement invariant across gender and ethnic groups. Our own analyses showed these measurements not to be measurement invariant across educational tracks (author 2016). This finding further informed our choice to limit the sample for the analysis to students in the vocational track.

Social context factors

Parental support. For the measurement of parental support, we made use of a measurement which entails discussing educational issues and future aspirations at home. This scale was adapted from Eggert et al.'s Parental Support Scale (1991) and includes six items relating to all three support types addressed by motivation theorists (e.g. Connell & Welborn 1991), *e.g.* structure support "My parents make sure that I do my homework"; autonomy support "My parents talk to me about my future"; and involvement "My parents give me the support I need to do well in school." (α = .80).

[3] A complete overview of the sample items per latent construct can be found in table 1 of the results section.

Teacher support. For measuring teacher support we relied upon the Attitudes Towards Teachers Measurement from McCoach (2002). The 6 items mostly focus on the involvement of teachers and therefore not capture the autonomy and structure support dimensions, *e.g.* "My teachers respect me as a person" and "My teachers try to help me do well in school" (α = .82).

Self-system factors

We distinguish self-system factors regarding one's perceived competence and control, a latent construct for measuring identified regulation, a single item measurement of intrinsic motivation, and a latent construct measuring relatedness to school. With regard to perceived competence we distinguish students' academic self-concept and perceived control over producing positive study results. Both dimensions are found across empirical studies testing SSMMD (e.g. Fall & Roberts 2012; Rotermund 2010).

Perceived competence. Regarding academic self-concept we used 5 items from the Academic Self-Concept Questionnaire, adapted from Liu and Wang (2005). Our measurement of student's academic self-concept included 5 items such as "I perform well in most of my school subjects." (α = .76).

Perceived control. For perceived control we utilised Wang et al.'s (2011) measurement of self-regulated learning. For students' perceived control we used items such as "I am good at figuring out problems and planning how to solve them." (α = .63).

Identified regulation and intrinsic motivation. For measuring identified regulation and intrinsic motivation we applied items from Wang et al.'s (2011) scale for valuing school education. This scale provided 3 items for measuring identified regulation, *e.g.* "Trying hard at school will help me to get a good job." (α = .71) and a single item for intrinsic motivation: "I enjoy learning new things".

Relatedness. For measuring students' relatedness to school, this study used Wang et al.'s (2011) construct for school belonging. A sample item for school belonging is "I feel like a real part of this school." (α = .88).

Behavioural engagement and disaffection

Attentiveness in class. Our measurements of behavioural engagement are twofold. A first measurement is adapted from Wang et al.'s (2011) operationalisation of attentiveness in class (*e.g.* "I often find it hard to keep my mind on my work at school - reverse scored."; α = .72).

Study behaviour. Another factor for behavioural engagement was adapted from Wang et al.'s (2011) measurement of cognitive strategy use (*e.g.* "When I do my homework, I make sure that I get started on it early."). Although the cognitive strategy use measurement was initially measuring cognitive engagement, two items include the phrase 'when I *do* my homework…'. An initial explorative factor analysis also convinced us to add two items from our survey that more clearly captures the behavioural engagement dimension of the construct, *e.g.* "I put a lot of effort into my schoolwork." ($\alpha = .87$).

School misconduct. For measuring behavioural disaffection, our data gave access to items on non-compliance to school regulations (Wang et al., 2011; *e.g.* "how often have you been sent to office for doing something wrong?"; $\alpha = .82$).

Data analysis

The findings section reports the results of the SEM testing the measurement model and structural relations hypothesised by the SSMMD using AMOS software (version 23). We tested to what extent parental and teacher support, as well as self-system processes relate to behavioural engagement and disaffection. The SEM allows for the structural relations to be modelled graphically to enable a clear understanding of the theory under study. Figure 1 shows a simplified conceptual model of the structural model that we fitted to our data sample. The model is simplified graphically in the sense that it does not present the measurement models measuring the different latent constructs in the model and because it only contains the significant ($p<0.05$) structural relations that were kept in the final model.

*** *Figure 1 about here* ***

Findings

The model fit output for the SEM – including both the measurement model and the structural relations – showed a normed Chi squared of 3.72, baseline comparison indexes CFI, IFI values of 0.9, an (adjusted) goodness of fit index of 0.89 (0.87) and a Root Mean Square Error of Approximation (RMSEA) of 0.053 (90 confidence interval: [0.051-0.055]) and a Standardized Root Mean Square Residual (SRMR) of 0.0637. Although the relative fit indexes CFI and IFI do not meet the ideal 0.95 cut-off values (e.g. Hu and Bentler 1999), the baseline comparison indexes can still be considered representing an acceptable fit (e.g. Westland, 2016). The RMSEA < 0.06 means

that the model fits well relative to its degrees of freedom and the SRMR < 0.08 indicates that the model captures the data well. The goodness of fit index and particularly the index for the adjusted goodness of fit, however, drop below the 0.9 threshold value (Mulaik et al. 1989). We address this issue more in detail in the discussion section.

Table 1 shows the description of the indicators, standardised regression weights, standard errors and p-values in the measurement model of the latent constructs in the SEM. The observed items show all significant ($p < 0.01$) and moderate to strong standardised regression weights (Beta's ranging between 0.479 for indicator 18 measuring perceived control and 0.930 for indicator 27 measuring study behaviour).

*** Table 1 about here ***

Table 2 contains the direct and total standardised regression weights, standard errors and p-values of the structural relations in the final model of the SEM. To account for the indirect effects of the social context factors on students' behavioural engagement and disaffection, we added the standardised total effects in brackets.

*** Table 2 about here ***

In discussing the structural relations of the SEM, we first consider testing the hypothesised relations between students' perceived support from parents and teachers with regard to the perceived level of meeting the psychological needs of feeling competent, autonomous and related. The support from parents significantly increases students' perceived competence, perceived control and identified regulation, but not their intrinsic motivation, nor relatedness to school. The strongest significant relation between parental support and self-system processes is shown in students' identified regulation. The support from parents significantly impacts students identified regulation (*i.e.* engagement motivated by education's merit for their future) but not their intrinsic motivation of engagement (*i.e.* regulation based on personal enjoyment of learning). The support from teachers significantly and positively impacts all five self-system factors in the model. Moreover, the standardised regression weights are all higher than for the effects of perceived parental support. The strongest impact of teacher support is on students' sense of relatedness to school. This could be theoretically expected because the items in the teacher support scale available in this study predominantly capture teacher's involvement, which is theoretically mostly linked to supporting the need of feeling related.

In the quest for strengthening our model fit, we investigated how the self-system processes could impact each other. Because the measurements of perceived autonomy available in our data already capture the regulation style of students engagement – rather than just the perceived level of autonomy in making choices and showing engagement in education – we allowed the competence, control and relatedness factors to be correlated with students' identified regulation and intrinsic motivation. We hereby tested to what extent the regulatory styles are themselves related to feeling competent and in control, as well as feeling related to school. In the final model we only kept the significant relations in the model. The findings show that perceived control is positively correlated with both students' intrinsic motivation as well as identified regulation. Feeling in control of one's academic achievements therefore supports students' enjoyment of learning as well as the idea that getting a good education strengthens one's prospects. Feeling more related to school also relates to a higher level identified regulation, this relation, however, is only marginally significant ($p = 0.064$).

We now move to discussing the relations between the self-system factors and students' behavioural engagement and disaffection. With regard to students' perceived competence and control, the SEM output shows both hypothesised and contra-hypothetical findings. Whereas, feeling competent significantly and strongly supports students' attention in class, it also significantly increases students' likelihood of showing school misconduct. Furthermore, feeling in control does not increase, but significantly reduces students positive study behaviour. The latter effect is, however, small relative to the other effect sizes in the model. The strongest significant relation, however, was positive and found between perceived competence and attention in class. We will discuss the counter-hypothetical findings more in detail in the discussion section. Looking at relationships between perceived autonomy and behavioural engagement/disaffection, our data shows a significant positive impact of both identified regulation and intrinsic motivation on study behaviour. The standardised effect of identified regulation is, however, stronger than for intrinsic motivation. This means that, contrary to the idea that intrinsic motivation has the strongest impact on students' behavioural engagement, in our sample, identified regulation is more closely related to positive study behaviour. Also, only identified regulation significantly reduces students school misconduct. The latter effect is, however, only marginally significant. The final self-system factor in our model is relatedness. Feeling related to school only significantly correlates to school misconduct and – different than theoretically expected – increases the occurrence of school misconduct. This finding will also be elaborated on in the discussion section.

Finally, we present the direct and total effects of the social context factors on students' behavioural engagement and disaffection. Our analysis shows a significant positive direct effect of parental support on study behaviour. The direct effects of parental support on attention in class and school misconduct are not significant. When also considering the indirect effect of parental support, *i.e.* effects running through the self-system processes, the total effect of parental support on study behaviour further increase, therefore confirming that the effects of parental support on behavioural engagement at least partially occur through self-system processes. Teacher support shows significant direct effects for all behavioural engagement/disaffection factors in our model. The perceived support from teachers significantly increases students' study behaviour and attention in class, as well as decreases the likelihood of student misconduct in school. Taking into account the indirect effects of teacher support captured by the self-system processes, the total effects further increase with regard to study behaviour and attention in class. The protective direct effect on school misconduct, however, is toned down by the self-system processes. This is not surprising when considering the strong relation between teacher support and feeling related to school, together with the finding that feeling related to school, in our sample, predicts higher levels of school misconduct.

In the discussion section we will elaborate on the findings, particularly regarding the findings that go against the relations hypothesised by the SSMMD. In doing so, we will make explicit linkages with other research specifically focussing on at-risk student populations in similar highly stratified and segregated Western European educational contexts. We will argue that early hierarchical tracking and, consequently, segregated urban vocational schools could play a role in explaining the contra-hypothetical findings in our model.

Conclusion and discussion

This study adds to the body of literature on explaining early leaving from education and training (ELET), particularly focussing on students considered being at risk based on their socially disadvantaged status in education. As for many education systems, in Flanders, students with a socially disadvantaged and/or immigrant background are strongly overrepresented the lower status vocational track, grade retention and ELET figures, which is particularly manifested in inner-city schools (authors 2016; Flemish Ministry of Education and Training 2019). Often, students' sociodemographic background and systemic inequalities in education are considered relatively fixed and beyond the influence of individual schools and teachers. Although we do not claim structural reforms in education systems cannot tackle social inequalities in educational outcomes, nor claim that policy reforms should not be strived for, in this study, we turned to literature on educational resilience to explore the variance in achievement that exists within at-risk groups. Instead of focussing on risk factors, theory on educational

resilience provides an alternative perspective that can shift attention to more alterable protective factors for tackling ELET. Starting from the broadly supported notion that ELET should be considered as a potential endpoint of a gradual process of disengagement from school, this study tried to further explain students' behavioural school engagement and disaffection. Using the theoretical framework of the Self-system Model of Motivational Development we tested to what extent contextual factors and self-system processes can support or hinder students' school engagement and disaffection, more particularly within a student population shown to be most at risk for ELET in Flemish secondary education, namely students in urban vocational secondary schools.

As behavioural engagement and disaffection theoretically has its antecedents in perceived support and self-system processes, we tested these underlying processes hypothesised by the SSMMD using structural equation modelling (SEM). Overall, the SEM supported that both teacher and parental support heighten perceived competence, autonomy and relatedness (the latter only for teacher support), as well as students' behavioural engagement. What is more, the impact of parental and teacher support was higher – and in terms of parental support, only significant – with regard to students identified regulation than for intrinsic motivation, potentially by stressing the importance of getting a good education for future life opportunities. Vallerand et al. (1997) indicated that supporting identified regulation might be of most interest to keep students who do not feel school is interesting from dropping out.

The findings also showed that the impact of teacher support on students' self-system processes and behavioural engagement is stronger than the perceived support from parents. Moreover, looking at the total effects of parental and teacher support on the behavioural engagement/disaffection factors, and therefore taking into account the indirect effects running through the self-system processes, the initial direct effects of perceived parental and teacher support on behavioural engagement further increases. The protective direct effect of feeling supported by teachers on behavioural disaffection, however, was reduced by taking into consideration the self-system processes. This finding brings us to discussing a few counter-hypothetical findings regarding relations between self-system and engagement/disaffection factors tested using our sample, as will be discussed in the next paragraphs.

Situating the findings in an early and hierarchically tracked education system

Notwithstanding the empirical support for most hypothesised relations, our data do not support all relations of the SSMMD. Students in our sample who report higher levels of competence and relatedness, reported significantly more school misconduct. Previous research in a similar Flemish setting – *i.e.* in (urban) vocational schools – could

provide part of the explanation for these counter-hypothetical findings. Many studies have shown negative effects of early and hierarchical tracking in Flemish secondary education (*e.g.* Authors 2016; Demanet & Van Houtte 2011; Van Houtte & Stevens 2009). Van Houtte and Stevens (2008), for instance, showed that vocational students in Flanders report higher levels of school misconduct than in other educational tracks. The relation between the educational track provided in a school and misconduct could, however, not to be attributed to students' self-esteem but rather by a perceived sense of futility that goes with being placed in a vocational school.[4] One can therefore expect that adding students' sense of futility to our analyses could also shed more light on the relationship between perceived competence and school misconduct in our study, that was performed in a very similar student population.

Demanet and Van Houtte (2011) showed that feelings of frustration amongst students in lower status vocational schools can give rise to a delinquent subculture, which in turn could imply that feeling more related to a school context with a negative school culture (*i.e.* more feelings of futility and frustration) could therefore explain our finding that students who feel more related to their school and peers in our sample show more school misconduct. To further test this hypothesis, we encourage researchers to use multilevel analyses to study to what extent a negative shared school culture among students in lower status vocational schools can impact the relationship between perceived relatedness to a particular school (population) and behavioural disaffection.

Our own research using data from a similar research setting in Flanders has shown that – in response to negative stereotypes about having a non-European migration background and being enrolled in the lower status vocational track – students in these stigmatised groups can psychologically disengage their perceived academic competence from their actual achievement and, ultimately, disidentify from setting positive goals in education, especially when they do not feel supported by their teachers (Authors 2016). Feeling threatened by stereotypes about one's social identity and track position could therefore also explain part of the relations between perceived competence and behavioural disaffection.

Regarding the finding that perceived control about one's study results in decreasing behavioural engagement in studying, we hypothesise that when students do not feel sufficiently challenged by their academic environment, high perceived control can also diminish study engagement. Particularly when engagement is regulated by the outcome rather than the enjoyment of the process, students who feel confident about knowing how to get a good educational outcome, might feel less motivated to engage in studying. Moreover, research in the hierarchically

[4] While our study utilises perceived academic competence rather than general self-esteem, both concepts are hierarchically related concepts (Marsh & Shavelson 1985).

tracked Flemish educational context showed that teacher recommendations are an important factor in the process of track placement and showed these recommendations to be often socially biased (e.g. Boone & Van Houtte 2013; Thys & Van Houtte 2016). A consequence is that students with lower SES backgrounds are more likely to be wrongfully oriented to less academically demanding study tracks. Given that our sample shows a strong overrepresentation of socially disadvantaged students in the vocational track, many students might not be sufficiently challenged academically, resulting in perceived control to potentially have negative effects on behavioural engagement. In future research, we therefore recommend scholars to take into account prior academic achievement measured before the educational tracking of students. Controlling for prior achievement could shed more light on the negative relationship between perceived control and behavioural engagement in this particular student population.

Limitations and future directions

We now outline some limitations of this study and provide some future directions to further develop the use of the SSMMD in explaining a gradual process of school disengagement, potentially leading to ELET. As the survey was part of a large-scale international study, the measurements included in the survey were negotiated amongst scientific peers, resulting in some pragmatic choices. Although the measurement model of the SEM and reliability testing rendered positive results for construct validity and internal item reliability, more elaborated measurement of some theoretical constructs – in particular the measurements of intrinsic motivation and teacher support – could further falsify and deepen the understanding of our findings.

Another limitation is the fact that all data are self-reported, which makes them vulnerable for a social desirability bias. Future research could strengthen the claims made in this study by including other data sources such as administrative data, for instance regarding non-compliance to school regulations. Most of the latent constructs in the SSMMD, however, capture self-perceptions and psychological processes, for which self-reports have the strength to measure what is real to students and not what is learned through indirect assessment.

Also, the structural relations tested in the SEM are based on cross-sectional data. The relations amongst the context, self-system and engagement factors are theoretically understood as a reciprocal and cyclical process. Many studies have, however, found empirical evidence for these processes (*e.g.* Furrer & Skinner 2003; Skinner et al 2008).

Finally, while most of the model fit indices indicated a good or acceptable fit, the (adjusted) goodness of fit indexes (GFI and AGFI), although only by small margins, did not meet the proposed 0.9 threshold values (e.g. Mulaik et al. 1989; Westland 2016). Given the fact that we wanted to keep close to the original theoretical model in testing the SSMMD hypotheses, the fairly strong factor loadings in the measurement model, as well as limiting the final model to significant relations in the structural model, we did not see how we could further improve the model fit. We therefore urge other researchers to try and replicate our analysis with a similar student sample in order to further strengthen or falsify our findings, particularly those who are not in line with the SSMMD based hypotheses.

Many of the studies cited in the discussion address the role of systemic features of Flemish education– *i.e.* high levels of stratification between educational tracks, particularly in urban contexts – in providing part of the explanation for the fact that some relations diverge from what can be deducted from the theory of the SSMMD. We therefore encourage scholars to study how systemic features impact the dynamic interactions between social support in students' context, self-system processes, behavioural engagement/disaffection and – ultimately – social inequalities in educational outcomes such as ELET.

Systemic reforms often take a long time. What our findings show, however, is that in the meantime a focus on interpersonal relations and intrapersonal processes can make a crucial difference in students' educational resilience that can help to overcome structural inequalities in education. Educators and parents are key actors in students' educational careers and can have an important impact on preventing ELET. Teachers and parents could be more equipped to detect early signs of disengagement. While the behavioural dimension of engagement is often more overt, the underlying psychological processes are more covert but nonetheless crucial in preventing ELET. Therefore, we argue that the SSMMD theory also supports policy makers and educators in designing and implementing more tailored prevention and interventions strategies to tackle ELET. Moreover, the prevention of ELET could profit from providing educators – teachers and parents alike – with the tools, knowledge and skills to detect early signs of school disengagement and to also support young people when lacking perceived competence, relatedness or autonomy. Social support can spur into breaking a gradual process of disengagement from school. Moreover, qualitative longitudinal research shows the importance of the various forms of social capital one can access through one's social networks. Although socially disadvantaged students' personal context might not always provide the knowledge and resources that help them to navigate through the often complex educational landscape, many of them feel their parents' emotional involvement with and aspirations for their futures, that are

often linked to performing well in education. This parental involvement can be capitalised on by schools and teachers in order to support students' identified regulation of engagement in education (Authors 2017; Rezai 2017).

References

Agasisti, T., Avvisati, F., Borgonovi, F., & Longobardi, S. (2018). Academic resilience: What schools and countries do to help disadvantaged students succeed in PISA. *Organisation for Economic Co-operation and Devlopment*.

Appleton, J. J., Christenson, S. L., & Furlong, M. J. (2008). Student engagement with school: Critical conceptual and methodological issues of the construct. *Psychology in the Schools*, *45*(5), 369-386.

Authors. (2015).

Author. (2016).

Authors. (2016).

Boone, S. & Van Houtte, M. (2013) Why are teacher recommendations at the transition from primary to secondary education socially biased?, *A mixed- methods research, British Journal of Sociology of Education*, 34(1), 20–38.

Christenson, S.L., Sinclair, M.F., Lehr, C.A., & Godber, Y. (2001). Promoting successful school completion: Critical conceptual and methodological guidelines. *School Psychology Quarterly*, 16, 468–484.

Christenson, S. L., & Thurlow, M. L. (2004). School dropouts: Prevention considerations, interventions, and challenges. *Current Directions in Psychological Science*, 13(1), 36-39.

Connell, J. P., & Wellborn, J. G. (1991). Competence, autonomy, and relatedness: A motivational analysis of self-system processes.

Connell, J. P., Spencer, M. B., & Aber, J. L. (1994). Educational risk and resilience in African- American youth: Context, self, action, and outcomes in school. *Child development*, *65*(2), 493-506.

Deci, E. L., & Ryan, R. M. (1985). The general causality orientations scale: Self-determination in personality. *Journal of research in personality*, *19*(2), 109-134.

Deci, E. L., Vallerand, R. J., Pelletier, L. G., & Ryan, R. M. (1991). Motivation and education: The self-determination perspective. *Educational psychologist*, *26*(3-4), 325-346.

De Loof, H., Struyf, A., Boeve-de Pauw, J., & Van Petegem, P. (2019). Teachers' Motivating Style and Students' Motivation and Engagement in STEM: the Relationship Between Three Key Educational Concepts. *Research in Science Education*, 1-19.

Demanet, J., & Van Houtte, M. (2011). Social-ethnic school composition and school misconduct: Does sense of futility clarify the picture?. Sociological Spectrum, 31(2), 224-256.

Eggert, L. L., & Herting, J. R. (1991). Preventing teenage drug abuse: Exploratory effects of network social support. *Youth & Society*, *22*(4), 482-524.

European Commission. (2011). Tackling early school leaving: A key contribution to the Europe 2020 Agenda (COM [2011] 18 final). Brussels, Belgium. Retrieved from http:// ec.europa.eu/education/school-education/doc/earlycom_en.pdf.

European Commission. (2018). Education and Training Monitor 2018. Luxembourg: Publications Office of the European Union. Retrieved from https://ec.europa.eu/education/sites/education/files/document-library-docs/volume-1-2018-education-and-training-monitor-country-analysis.pdf.

European Education Information Network (EURYDICE) and European Centre for the Development of Vocational Training (CEDEFOP). (2014). *Tackling early leaving from education and training in Europe: strategies, policies and measures*. Education, Audiovisual and Culture Executive Agency, Brussels, Belgium.

Fall, A. M., & Roberts, G. (2012). High school dropouts: Interactions between social context, self-perceptions, school engagement, and student dropout. *Journal of adolescence*, *35*(4), 787-798.

Finn, J. D. (1989). Withdrawing from school. *Review of Educational Research*,59, 117–142.

Flemish Ministry of Education and Training. (2015). Actieplan Vroegtijdig Schoolverlaten. Retrieved From: http://www.ond.vlaanderen.be/secundair/Actieplan_Vroegtijdig_ Schoolverlaten_def.pdf.

Flemish Ministry of Education and Training. (2019). Vroegtijdig schoolverlaten in het Vlaams Secundair Onderwijs: Cijferrapport voor de Schooljaren 2009-2010 tot en met 2016-2017. Brussels: Department Education and Training.

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of educational research*, *74*(1), 59-109.

Furrer, C., & Skinner, E. (2003). Sense of relatedness as a factor in children's academic engagement and performance. *Journal of educational psychology*, *95*(1), 148.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural equation modeling: a multidisciplinary journal*, *6*(1), 1-55.

Janosz, M., LeBlanc, M., Boulerice, B., & Tremblay, R. E. (1997). Disentangling the weight of school dropout predictors: A test on two longitudinal samples. *Journal of youth and adolescence*, *26*(6), 733-762.

Janosz, M., Archambault, I., Morizot, J., & Pagani, L. S. (2008). School engagement trajectories and their differential predictive relations to dropout. *Journal of social Issues*, 64(1), 21-40.

Lam, S. F., Jimerson, S., Shin, H., Cefai, C., Veiga, F. H., Hatzichristou, C., ... & Basnett, J. (2016). Cultural universality and specificity of student engagement in school: The results of an international study from 12 countries. *British Journal of Educational Psychology*, *86*(1), 137-153.

Lamb, S., & Markussen, E. (2011). School dropout and completion: An international perspective. In *School dropout and completion* (pp. 1-18). Springer, Dordrecht.

Lamote, C., Speybroeck, S., Van Den Noortgate, W., & Van Damme, J. (2013). Different pathways towards dropout: the role of engagement in early school leaving. *Oxford Review of Education*, *39*(6), 739-760.

Lavrijsen, J., & Nicaise, I. (2015). Social inequalities in early school leaving: The role of educational institutions and the socioeconomic context. *European Education*, *47*(4), 295-310.

Liu, W. C., & Wang, C. K. J. (2005). Academic self-concept: A cross-sectional study of grade and gender differences in a Singapore secondary school. *Asia Pacific Education Review*, *6*(1), 20-27.

Marsh, H. W., & Shavelson, R. (1985). Self-concept: Its multifaceted, hierarchical structure. *Educational psychologist*, *20*(3), 107-123.

McCoach, D. B. (2002). A validation study of the school attitude assessment survey. *Measurement and evaluation in counselling and development, 35*(2), 66-77.

Mulaik, S. A., James, L. R., Van Alstine, J., Bennett, N., Lind, S., & Stilwell, C. D. (1989). Evaluation of goodness-of-fit indices for structural equation models. *Psychological bulletin*, *105*(3), 430.

Organisation for Economic Co-operation and Development (OECD). (2012). *Equity and quality in education: Supporting disadvantaged students and schools*, Paris: OECD Publishing.

Quin, D. (2017). Longitudinal and contextual associations between teacher–student relationships and student engagement: A systematic review. *Review of Educational Research*, 87(2), 345-387.

Quin, D., Heerde, J. A., & Toumbourou, J. W. (2018). Teacher support within an ecological model of adolescent development: Predictors of school engagement. *Journal of school psychology*, *69*, 1-15.

Reeve, J., Jang, H., Carrell, D., Jeon, S., & Barch, J. (2004). Enhancing students' engagement by increasing teachers' autonomy support. *Motivation and Emotion*, 28, 147–169.

Rezai, S. (2017). *The Rise of the Second Generation : the role of social capital in the upward mobility of descendants of immigrants from Turkey and Morocco*. Erasmus University Rotterdam. Retrieved from http://hdl.handle.net/1765/102766.

Rotermund. S. L. (2010). *The role of psychological antecedents and student engagement in a process model of high school dropout*. Ph.D. dissertation. Santa Barbara: University of California. Santa Barbara.

Rumberger, R. W., & Lim, S. A. (2008). Why students drop out of school: A review of 25 years of research. *California Dropout Research Project*, *15*, 1-3.

Skinner, E. A., Wellborn, J. G., & Connell, J. P. (1990). What it takes to do well in school and whether I've got it: A process model of perceived control and children's engagement and achievement in school. *Journal of educational psychology*, *82*(1), 22.

Skinner, E. A., & Belmont, M. J. (1993). Motivation in the classroom: Reciprocal effects of teacher behaviour and student engagement across the school year. *Journal of educational psychology*, *85*(4), 571.

Skinner, E., Furrer, C., Marchand, G., & Kindermann, T. (2008). Engagement and disaffection in the classroom: Part of a larger motivational dynamic?. *Journal of educational psychology*, *100*(4), 765.

Thys, S., & Van Houtte, M. (2016). Ethnic composition of the primary school and educational choice: Does the culture of teacher expectations matter?. *Teaching and Teacher Education*, *59*, 383-391.

Ungar, M., & Liebenberg, L. (2013). Ethnocultural factors, resilience, and school engagement. *School Psychology International*, *34*(5), 514-526.

Vallerand, R. J., Fortier, M. S., & Guay, F. (1997). Self-determination and persistence in a real-life setting: toward a motivational model of high school dropout. *Journal of Personality and Social psychology*, *72*(5), 1161.

Van Houtte, M., & Stevens, P. A. (2009). Study involvement of academic and vocational students: Does between-school tracking sharpen the difference?. *American Educational Research Journal*, *46*(4), 943-973.

Wang, M. T., Willett, J. B., & Eccles, J. S. (2011). The assessment of school engagement: Examining dimensionality and measurement invariance by gender and race/ethnicity. *Journal of School Psychology*, 49(4), 465-480.

Wang, M. T., & Eccles, J. S. (2012). Social support matters: Longitudinal effects of social support on three dimensions of school engagement from middle to high school. *Child development*, *83*(3), 877-895.

Westland, J. C. (2016). *Structural Equation Models*. Springer International PU.

Table 1: Standardized Regression Weights of the Measurement Model

Latent constructs	Observed variables	Description of the items	β	S.E.	p-values
Parental Support	Ind1	My parents make sure that I do my homework	0.57		
	Ind2	My parents make sure that I go to school every day	0.534	0,056	***
	Ind3	My parents praise me when I do well in school	0.737	0,049	***
	Ind4	My parents believe that education is important to succeed in life	0.596	0,043	***
	Ind5	My parents talk to me about my future	0.737	0,061	***
	Ind6	My parents give me the support I need to do well in school	0.754	0,064	***
Teacher Support	Ind7	Most of the teachers at this school are good teachers	0,677		
	Ind8	My teachers feel that my work is poor - reverse scored	0,57	0,051	***
	Ind9	My teachers try to help me do well in school	0,652	0,053	***
	Ind10	My teachers respect me as a person	0,768	0,051	***
	Ind11	My teachers do not treat me fairly - reverse scored	0,667	0,056	***
	Ind12	My teachers don't care if I fail or succeed - reverse scored	0,585	0,062	***
Perceived Competence	Ind13	I am able to help my classmates in their schoolwork	0,555		
	Ind14	I am good in most of my school subjects	0,756	0,081	***
	Ind15	I usually do poorly in tests - reverse scored	0,556	0,085	***
	Ind16	I am able to do better than my friends in most subjects	0,533	0,081	***
	Ind17	I can follow the lessons easily	0,683	0,076	***
Perceived Control	Ind18	I am good at dealing with setbacks at school (e.g. bad marks, negative feedback on my schoolwork)	0,482		
	Ind19	I am good at figuring out problems and planning how to solve them	0,82	0,134	***
	Ind20	I often try to learn from my mistakes	0,514	0,079	***
Identified Regulation	Ind21	Trying hard at school will help me to get a good job	0,752		
	Ind22	Trying hard at school will help me to go to college/university	0,639	0,053	***
	Ind23	Getting a good education is the best way to get ahead in life	0,652	0,046	***

Relatedness	Ind24	I think this is a good school	0,852		
	Ind25	I feel like a real part of this school	0,801	0,036	***
	Ind26	I would recommend to other kids that they go to my school	0,852	0,04	***
Study	Ind27	I spend a lot of time on my schoolwork	0,93	0,06	
Behaviour	Ind28	I put a lot of effort into my schoolwork	0,923	0,059	***
	Ind29	When I do my homework I try to plan what I have to do before I get started	0,645		***
	Ind30	When I do my homework I make sure that I get started on it early	0,567	0,058	***
Attention	Ind31	I often have trouble paying attention to the teacher in class - reverse scored	0,801		
In Class	Ind32	I often find it hard to keep my mind on my work at school - reverse scored	0,736	0,066	***
School	Ind33	How often have you hit someone for what they said/did?	0,553		
Misconduct	Ind34	How often have you been involved in a physical fight?	0,86	0,096	***
	Ind35	How often have you been sent to office for doing something wrong?	0,826	0,093	***

Notes: Using SEM to estimate the parameters, standard errors and p-values, required the variance of the first indicator of each latent construct to be set to 1; *** $p < .01$;

Model fit indices: $\chi 2/df$ = 3.72; CFI= 0.9; IFI=0.9; GFI=0.89; AGFI=0.87; RMSEA= 0.053 CI90= [0.051-0.055]; SRMR= 0.637

Table 2: Standardised Regression Weights in the Structural Model

			βdirect (βtotal)	S.E.	p-values
Perceived Competence	<---	Parental Support	0.18	0.028	***
Perceived Control	<---	Parental Support	0.221	0.036	***
Identified Regulation	<---	Parental Support	0.226	0.039	***
Perceived Competence	<---	Teacher Support	0.383	0.036	***
Perceived Control	<---	Teacher Support	0.250	0.036	***
Identified Regulation	<---	Teacher Support	0.393	0.056	***
Intrinsic Motivation	<---	Teacher Support	0.327	0.048	***
Relatedness	<---	Teacher Support	0.555	0.057	***
Intrinsic Motivation	<---	Perceived Control	0.217	0.068	***
Identified Regulation	<---	Perceived Control	0.118	0.060	***
Identified Regulation	<---	Relatedness	0.083	0.034	0.063
Attention in Class	<---	Perceived Competence	0.344	0.099	***
School Misconduct	<---	Perceived Competence	0.215	0.044	***
Study Behaviour	<---	Perceived Control	-0.101	0.064	0.016
Study Behaviour	<---	Identified Regulation	0.215	0.056	***
School Misconduct	<---	Identified Regulation	-0.098	0.035	0.051
Study Behaviour	<---	Intrinsic Motivation	0.178	0.032	***
School Misconduct	<---	Relatedness	0.211	0.025	***
Study Behaviour	<---	Parental Support	0.165 (0.205)	0.041	***
Study Behaviour	<---	Teacher Support	0.149 (0.292)	0.055	***
Attention in Class	<---	Teacher Support	0.299 (0.430)	0.071	***
School Misconduct	<---	Teacher Support	-0.464 (-0.311)	0.049	***

*Notes: *** $p < .01$.;*

Model fit indices: $\chi 2/df = 3.72$; CFI= 0.9; IFI=0.9; GFI=0.89; AGFI=0.87; RMSEA= 0.053 CI90= [0.051-0.055]; SRMR= 0.637

Line Figure

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