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Negative Life Events, Self-Efficacy, and Social Support: Risk and Protective Factors for School Dropout Intentions and Dropout

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Prior studies have noted several risk and protective factors for school dropout; however, only a few have examined longer-term vulnerabilities alongside temporary risk and protective factors. Consequently, we focused on the role that both stable and time-varying psychosocial risk and protective factors play in dropout intentions and actual dropout, using a 4-year longitudinal design. We investigated to what extent dropout intentions and dropout can be predicted by an interplay between negative life events, general self-efficacy, and perceived social support. We distinguished between time-averaged levels of self-efficacy and social support, and within-person change in self-efficacy and social support over time. This enabled us to establish whether dropout intentions and dropout were sensitive to fluctuations in perceived self-efficacy and social support over time when controlling for person-specific levels of these psychosocial resources. Calculating multilevel models with data from a prospective cohort study ($N = 4,956$, 43% male), we found that negative life events were significantly associated with an increase in dropout intentions and the likelihood of school dropout. Furthermore, time-averaged levels of self-efficacy and social support, and a within-person (situational) increase in these characteristics relative to their time-averaged levels, were related to lower levels of dropout intentions but did not prevent dropout. The positive relationship between negative life events and dropout intentions was attenuated for individuals who perceived higher levels of self-efficacy than usual. Our findings suggest future research should further investigate time-averaged and situational psychosocial drivers of school dropout in combination.

Educational Impact and Implications Statement

This study indicates that the experience of negative life events is related to an increase in dropout intentions and the probability of actually dropping out of school or vocational training. Higher levels of both time-averaged and situational self-efficacy and social support are associated with lower levels of dropout intentions, and vice versa. Moreover, when young people feel more efficacious than usual, they are significantly less likely to think about quitting their school or vocational training even in the presence of negative life events. These findings suggest that dropout prevention programs might be more effective if they consider both time-invariant and time-varying social and psychological risk and protective factors.

Keywords: negative life events, risk and protective factors, school dropout, self-efficacy, social support

Adolescents who leave school prior to completion are likely to display social, academic, behavioral, and economic vulnerabilities (De Witte, Cabus, Thyssen, Groot, & van den Brink, 2013; Doll,

Eslami, & Walters, 2013; Janosz, Le Blanc, Boulerice, & Tremblay, 2000). It is therefore crucial to identify risk and protective factors for both dropout intentions and actual dropout to elucidate and prevent school dropout and its long-lasting consequences.

Over the last decades, research has provided accumulating evidence that school dropout must be considered as a long-term process, rather than as an event, with dropout constituting the endpoint of a long trajectory of academic disengagement and failure that typically starts in early childhood, often even before children enter school (Alexander, Entwisle, & Horsey, 1997; Alexander, Entwisle, & Kabbani, 2001; Christenson & Thurlow, 2004; Dupéré et al., 2015; Jimerson, Egeland, Sroufe, & Carlson, 2000). This long-term view has significantly advanced our understanding of the antecedents of dropout and highlighted key implications for early prevention of school dropout. However, the focus on dropout as the ultimate consequence of a complex process that unfolds over time may have concealed the role that temporary

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stressors and transitory psychological states play in inducing dropout intentions and actual dropout. This is problematic considering that more than one of three dropouts do not exhibit clear signs of school failure, disengagement, or serious academic or behavioral problems in the years prior to dropping out (Dupéré et al., 2015; Janosz et al., 2000). In other words, short periods of increased stress might trigger dropout intentions and actual dropout, even in the absence of a longer history of gradual school disengagement; or such periods may exacerbate preexisting risk and eventually lead to dropout intentions and/or actual dropout. Consequently, we examined how both situational and temporally more stable risk and protective factors were associated with dropout intentions and actual dropout among adolescents in transition to young adulthood. Specifically, we considered how significant negative life events (as temporary risk factors), as well as perceived self-efficacy and social support (as situational and time-averaged protective factors), predict dropout intentions and actual dropout during upper secondary education. We distinguished between person-specific (time-averaged) levels of perceived self-efficacy and social support on the one hand, and fluctuations (or within-person change) in perceived self-efficacy and social support across time on the other. This allowed us to examine whether dropout intentions and actual dropout were sensitive to situational protective factors, over and above temporally more stable (time-averaged) influences.

Predicting Dropout Intentions and Actual Dropout

Prior research has revealed multiple psychosocial determinants of dropout intentions, including stress and pessimism (Eicher, Staerklé, & Clémence, 2014), poor intrinsic motivation (Otis, Grouzet, & Pelletier, 2005), low levels of perceived academic control (Respondek, Seufert, Stupnisky, & Nett, 2017), poor self-determination (Alivernini & Lucidi, 2011), a lack of sense of belonging to school (Hausmann, Schofield, & Woods, 2007), and a weak integration in social networks in school (Thomas, 2000).

Moreover, there is accumulating evidence of a variety of factors that increase the risk for actual school dropout, including poor academic self-efficacy (Caprara et al., 2008), poor cognitive and educational achievement (Alexander et al., 1997; Balfanz, Herzog, & Mac Iver, 2007; Bowers, 2010; Lehr, Sinclair, & Christenson, 2004), low educational expectations (Driscoll, 1999), disruptiveness in school (Vitaro, Larocque, Janosz, & Tremblay, 2001), weak identification with school (Fall & Roberts, 2012), a lack of school friends (Ellenbogen & Chamberland, 1997), school disengagement (Henry, Knight, & Thornberry, 2012; Janosz, Archambault, Morizot, & Pagani, 2008), and low socioeconomic status (Battin-Pearson et al., 2000; Chapman, Laird, Ifill, & KewalRaman, 2012). For review studies, see for instance Christenson and Thurlow (2004), De Witte et al. (2013), Doll et al. (2013), Rosenthal (1998), Rumberger (1987), and Rumberger and Lim (2008).

However, empirical studies typically have focused either on dropout intentions or actual dropout. What is missing in the literature, is research examining whether, and to what extent, specific psychosocial risk and protective factors are related to both dropout intentions and actual dropout. Moreover, it remains unclear whether the same pattern of findings is seen when considering dropout intentions and actual dropout simultaneously. For instance, it will be important to understand which psychosocial

risk and protective factors predict dropout intentions and actual dropout, or both.

Another critical gap in the literature concerns the impact of transient stressors in combination with long-running risk and protective factors on dropout intentions and actual dropout. A few existing studies considering links between exposure to temporary stressors and dropout revealed that various stress factors are more common among students who drop out than among similar peers who continue school, including health problems (Homlong, Rosvold, & Haavet, 2013), youth arrest (Hirschfield, 2009), and parental imprisonment (Cho, 2011). These studies indicate that acute stressful events could precipitate school dropout (cf., Dupéré et al., 2015). However, these studies were limited in that they did not consider long-term risks in conjunction with acute stressors as the causes of school dropout. This is a key omission considering that researchers in other fields have long recognized that proximal processes compound long-term risks and thereby trigger, for instance, the onset of mental health or other problems (Hankin & Abela, 2005). It is therefore necessary to study school dropout from a vulnerability-stress perspective by considering how long-held vulnerabilities and exposure to ephemeral proximal stressors jointly and interactively contribute to dropout intentions and actual dropout.

To the best of our knowledge, there is only one prior study that specifically considered time-varying and time-invariant psychosocial risk and protective factors jointly in the analysis of school dropout (Eicher et al., 2014). This study predicted dropout intentions from person-specific average levels of stress and optimism over time, as well as from annually varying levels of stress and optimism. However, it did not look at actual dropout rates, which can differ significantly from the rates of dropout intention (Vallebrand, Fortier, & Guay, 1997). Considering the above-mentioned gap, we investigated whether situational psychosocial stressors were related to dropout intentions and actual dropout, when time-averaged levels of these same stressors were considered. Specifically, we assessed whether a situational decrease in perceived self-efficacy and social support at a given point was related to an increase in dropout intentions and actual dropout, when time-averaged levels in these characteristics (the mean levels across four observation points) were considered. Moreover, we considered negative life events to determine the significance and practical relevance of situational and time-averaged stressors when compared to the potential impact of major negative life events on dropout intentions and dropout. Finally, given that situational and enduring risk factors exacerbate effects of negative life events on mental and behavioral health (Monroe, Rohde, Seeley, & Lewinsohn, 1999; Murberg & Bru, 2004), we also analyzed whether the time-varying (situational) and time-averaged stressors interacted with negative life events in predicting dropout intentions and actual dropout.

Negative Life Events

Significant negative life events can be understood as stressors that entail physiological, psychological, and/or behavioral responses that can be either adaptive or maladaptive (Lantz, House, Mero, & Williams, 2005; Luhmann, Hofmann, Eid, & Lucas, 2012). They can be turning points in developmental trajectories, as they bring about unexpected change and tend to disrupt normal functioning (Dupéré et al., 2018). Exposure to stressful negative life events is linked with

higher levels of health and psychological problems and may undermine long-term psychosocial adjustment (Dohrenwend, 2000; Ge, Lorenz, Conger, Elder, & Simons, 1994; Linn, Linn, & Harris, 1981). Moreover, research suggests that the number of recently experienced stressful life events predicts school adjustment (Sterling, Cowen, Weissberg, Lotyczewski, & Boike, 1985). Hence negative life events might also explain variance in young people's decisions whether to drop out of school (cf., Dupéré et al., 2018).

However, the subjective evaluation of life events can vary across individuals. Thus, rather than significant life events per se, individuals' appraisals of the stressfulness of these events may be expected to determine the impact of such events on individuals' life trajectories (Folkman & Lazarus, 1988; Lazarus, 2006). It is therefore essential to consider psychosocial resources that may influence individuals' appraisals of stressful events, and facilitate coping with these events (Smith, Felix, Benight, & Jones, 2017). Although a wide variety of resources can affect the appraisal of stressors and improve coping strategies (e.g., Fall & Roberts, 2012; Janosz, LeBlanc, Boulerice, & Tremblay, 1997), we focused on two psychosocial resources whose significance has been established in diverse contexts—social support and general self-efficacy.

Social Support

Social support is a resource that influences psychological and physical well-being, psychosocial adjustment, and personal attainments (Ahmed, Minnaert, van der Werf, & Kuyper, 2010; Brinker & Cheruvu, 2017; Uchino, 2009; Williams, Connolly, Pepler, & Craig, 2005). Social support is typically divided into two types: perceived and received. Whereas perceived support refers to an individual's potential access to social support resources, received support refers to the actual receipt of support, generally during a specific time frame, and often in response to specific circumstances (Barrera, 1986; Uchino, 2009). In this study, we focused on education-related perceived social support, meaning an individual's perception that significant others care about and take an interest in his or her educational activities, decisions, and trajectories.

Extant studies suggest that perceived social support plays a key role in explaining dropout intentions (Legault, Green-Demers, & Pelletier, 2006). Moreover, perceived social support predicts students' perceptions of control and identification with school, which, in turn, foster academic commitment and achievement, thereby reducing the likelihood of actually dropping out (Fall & Roberts, 2012; Lagana, 2004). However, as useful as these prior insights are, they do not clarify whether dropout intentions and dropout are also sensitive to variations in perceived social support over time. We expect that a situational decrease in the level of perceived social support relative to a person-specific (time-averaged) level of perceived support over time may be associated with an increased likelihood of reporting dropout intentions and actual dropout, and vice versa.

Self-Efficacy

Self-efficacy refers to an individual's judgment of his or her capabilities to execute actions required to attain specific goals. Thus, it can be understood as a psychological resource that facilitates coping with a variety of demands (Bandura, 1993). Self-efficacy operates through its effect on cognitive, affective, motivational, and decisional processes. It influences "whether individuals think optimistically or pes-

simistically, in self-enhancing or self-debilitating ways" (Bandura, 2006, p. 170). Self-efficacy beliefs shape individuals' aspirations, goals, and outcome expectations, as well as perseverance in the face of adversity and difficulties (Bandura, Barbaranelli, Caprara, & Pastorelli, 2001; Komaraju & Nadler, 2013). Moreover, these beliefs determine how individuals perceive opportunities and impediments. The stronger their efficacy beliefs, the more ambitious the goals individuals set for themselves and the firmer their commitment to them (Bandura, 1989; see also Burger & Walk, 2016; Caprara, Vecchione, Alessandri, Gerbino, & Barbaranelli, 2011). Consequently, perceived self-efficacy may be related to dropout intentions and actual dropout. Furthermore, given that self-efficacy fluctuates within persons over time (Burger & Samuel, 2017), situationally perceived levels of self-efficacy may also be associated with a change in dropout intentions and the likelihood of actually dropping out.

Study Purpose and Hypotheses

Our central objective was to assess the role of, and the interplay between, significant negative life events, self-efficacy, and social support as predictors of dropout intentions and actual dropout during upper secondary education. We used a representative sample from Switzerland and a 4-year longitudinal design. Around the time of assessment, the dropout rate in Switzerland was 8.4%, measured as the percentage of 20- to 24-year-olds not in education and without an upper secondary education certificate. By comparison, it was around 12.3% in the United States, and approximately 15% on average across OECD countries (OECD, 2005). To assess whether dropout intentions and actual dropout were sensitive to situational influence, we distinguished between person-specific (time-averaged) levels of perceived self-efficacy and social support on the one hand, and situational fluctuations (within-person change) in the corresponding characteristics across time on the other. Drawing on prior theory and research (outlined above), we addressed four major research aims, testing the following hypotheses.

1. The first aim was to examine the links between exposure to significant negative life events and dropout intentions as well as actual dropout. We hypothesized that the number of recently experienced significant negative life events would be positively associated (a) with the frequency at which individuals consider quitting their school or apprenticeship, and (b) with the likelihood that an individual has effectively quit his or her school or apprenticeship.
2. The second aim was to examine the links between perceived social support and dropout intentions as well as actual dropout. We hypothesized that both time-averaged levels of perceived social support, and a situational increase in the level of perceived social support relative to one's time-averaged level of perceived social support, would be negatively associated (a) with the frequency at which individuals consider quitting their school or apprenticeship, and (b) with the likelihood that an individual has effectively quit his or her school or apprenticeship.
3. Third, we sought to examine the links between perceived self-efficacy and dropout intentions as well as actual dropout. We tested the hypothesis that both time-averaged levels of perceived self-efficacy, and a situational increase in the

level of perceived self-efficacy relative to one's time-averaged level, would be negatively associated (a) with the frequency at which individuals consider quitting their school or apprenticeship, and (b) with the likelihood that individuals have effectively quit their school or apprenticeship.

4. Our final aim was to investigate the interactions between negative life events and perceived social support as well as between negative life events and perceived self-efficacy. We hypothesized that the relationships between negative life events and dropout intentions as well as actual dropout would be moderated (a) by time-averaged levels of self-efficacy and social support, and (b) by situational (within-person) change in self-efficacy and social support.

Method

Sample

We used data from the Transitions from Education to Employment (TREE) project, a longitudinal survey analyzing the post-compulsory educational and work trajectories of compulsory-school leavers in Switzerland.¹ The original sample comprised 6,343 young people from 312 schools who participated in the Program for International Student Assessment (PISA) in 2000 (Bergman, Hupka-Brunner, Keller, Meyer, & Stalder, 2011). In the current study, we drew on data from the first four panel-waves, which occurred from 2001 to 2004. These panel waves were conducted using written questionnaires (most data collections took place from April to June each year). Respondents who did not return the questionnaire in time received two reminders, the first by mail and the second by phone. Those who then reported to be unable or unwilling to complete the survey were offered the opportunity to complete the survey by phone. The data from the TREE survey provide a unique opportunity to study the developmental course of dropout intentions and actual dropout during upper secondary education. Most participants attended the first year of upper secondary education in the first panel wave. To analyze trajectories of dropout intentions and actual dropout longitudinally, we restricted the analytical sample to participants who, as of 2001, attended either a general education (i.e., academic) track, which prepares students for tertiary education, or a vocational education track, which refers to training during an apprenticeship. We did not include participants who were involved in short-term activities such as internships, language stays, language courses, or preparation courses for vocational or general education; or were not in education, employment, or training; or were employed and did not pursue any educational program. Therefore, our analytical sample included 4,956 participants (level 2), representing 13,232 level-1 units across four panel waves.

Relative to the original sample in 2000, the analytical sample comprised slightly more female participants (56.8% vs. 54.2%), individuals born in Switzerland (89.6% vs. 85.7%), individuals with a marginally higher parental socioeconomic status ($M = 51.6$, $SD = 16.2$ vs. $M = 50.4$, $SD = 16.3$); as measured by the international socio-economic index of occupational status, cf. Ganzeboom, De Graaf, & Treiman, 1992), and individuals with better school performance, as assessed by the PISA reading score ($M = 530.5$, $SD = 80.9$ vs. $M = 510.0$, $SD = 89.0$). At the time of the PISA assessment in

2000, participants were on average 15.5 years ($SD = 0.63$). The TREE panel-waves started in 2001 and took place at annual intervals. Accordingly, participants were four years older in wave 4. In the complete sample, the response rates across panel waves ranged between 85% and 89% in each of the first four waves (TREE, 2013). However, the analytical sample used here comprised only 78.1% of the initial sample in 2000 because of panel attrition and because an increasing number of participants graduated from (general or vocational) education and thus left the education system between 2001 and 2004. Thus, we decided to run all our analyses on data from the same sample so that the estimates from different models can be compared directly.

The high response rates notwithstanding, the range of missing values on our independent variables varied between 0 and 9.5% across panel waves in the analytical sample. Following widespread recommendations (Graham, 2009; Lang & Little, 2018), we performed multiple imputation to adjust for missing values, imputing data across 100 data sets (cf., Sinharay, Stern, & Russell, 2001). In doing so, we accounted for within-person correlation and imputed jointly over persons using a multivariate normal model, assuming equal fractions of missing information (Allison, 2001). Thereby, we considered the two-level structure of the data. The analyses were performed separately on each of these imputed data sets, before pooling the results according to Rubin's rule (Rubin, 1987).²

Measures

Dropout intentions. Dropout intentions were operationalized using the item, "What do you generally think of your education (apprenticeship, pre-apprenticeship, school, etc.) lately?" This was followed by the statement "As soon as I find something better I will change my education/apprenticeship" and a scale with the introductory statement "I think this. . ." (1 = hardly ever to 7 = almost ever). Although this single-item measure is potentially less informative than a multi-item scale, prior research found very strong correlations (up to $r = .97$) between diverse items assessing dropout intentions (Alivernini & Lucidi, 2011; Hardre & Reeve, 2003) and, consequently, a single item can be used effectively in the study of dropout intentions (see also Eicher et al., 2014). We acknowledge that, for some students, our measure of dropout intentions might have captured the aspiration to improve their situation and pursue another type of education in the future, rather than the intention to withdraw completely from school. However, an affirmative response on this item clearly indicates some extent of psychological distress with the current educational situation, potentially predisposing individuals to less stable educational careers and making them more vulnerable for actual dropout. Empirically, we found that our measure of dropout intentions was positively associated with actual dropout, indicating that the measure was meaningful for the purpose of this study.

¹ The Swiss youth panel study, TREE, has been running since 2000 and is mainly funded by the Swiss National Science Foundation (distribution: Data service, FORS, Lausanne). All procedures performed, which involved human participants, were in accordance with the ethical standards of the institutions involved in data collection.

² The pooled results differ from the results based on complete-case analyses only to the extent that there was a significant but small positive effect of time and a significant negative effect of being female, in the models predicting dropout intentions. There were no significant differences in the models predicting actual dropout.

Actual dropout. Actual dropout was measured with the following introductory question, “Since the last time we contacted you in [] month and year of the last valid interview [] did any of the following happen to you?” This was followed by the statement, “I have quit school or an apprenticeship.” The response categories were 1 [] no, never; 2 [] yes, once; 3 [] yes, twice; and 4 [] yes, three times or more. Only a few people reported having quit school or an apprenticeship more than once (fewer than 13 cases per wave). Hence, we dichotomized this variable (0 [] did not drop out, 1 [] did drop out). A possible problem with this variable is that some respondents misinterpreted this question as representing regular graduation from school or apprenticeship. To check this, we controlled for every respondent who reported dropout, whether he or she received a certificate in the year(s) of reported dropout; that is, whether he or she did not drop out but “quit” school or an apprenticeship because of successful graduation. We found 75 cases of people who reported dropping out but also receiving a certificate (t_1 : 0 cases, t_2 : 3 cases, t_3 : 13 cases, and t_4 : 59 cases). These cases were excluded from further analyses. Another limitation of this measure is that it did not differentiate transient and permanent dropout.

Negative life events. The number of significant life events was measured on a scale consisting of seven items, adapted from Neuenchwander, Böni, Holder and Kunz-Makarova (1998) and Neuenchwander, Herzog, and Holder (2001). Using dichotomous response categories (0 [] no, 1 [] yes), participants were asked whether any of the following happened to them over the course of the preceding year: “My parents got separated or divorced,” “I had a severe accident or got a severe illness,” “A person who was close to me died,” “I had trouble with the police,” “I went through an unhappy relationship,” “I had a big quarrel at school,” “I had a big quarrel with friends or family.” Note that this scale did not measure a latent construct (like, e.g., the perceived self-efficacy scale). For instance, we cannot expect that a person who went through an unhappy relationship is more likely to also have had a severe accident or got a severe illness. Hence, the items simply indicate the number of life events that are likely to impede the accomplishment of educational tasks and goals. As prior research has suggested that a greater number of negative life events is associated with lower levels of psychosocial functioning and health (e.g., Bjorck & Thurman, 2007), we expected to find a positive relationship between the number of such life events and dropout intentions as well as actual dropout.

Perceived self-efficacy. Perceived (general) self-efficacy was assessed on a scale comprising four items, adapted from Schwarzer and Jerusalem (1999) and Schwarzer (2000). The scale varied between 1 (completely wrong) and 4 (completely right). The items were the following: “I am confident that I can cope with difficult challenges because I can trust my abilities”; “When a problem arises, I can always find a solution by my own efforts”; “Whatever happens, I will handle any difficult situation”; and “I can find a solution to any problem.” Cronbach’s alpha ranged from 0.73 to 0.75 across the panel waves (t_1 : 0.75, t_2 : 0.73, t_3 : 0.74, t_4 : 0.74).

Perceived social support. Perceived social support was measured on a scale consisting of four items, adapted from Frese and Zapf (1987). The scale ranged from 1 (not at all) to 4 (very much). The items were: “To what extent do the following persons take interest in your education/training: ‘your mother,’ ‘your father,’ ‘your partner/boyfriend/girlfriend,’ and ‘your best friends at school?’” As was the case with the measure assessing negative life

events, this scale did not measure a latent construct. Instead, the items simply indicate the amount of social support perceived at a given panel wave. We therefore do not report any Cronbach’s alpha values here.

Control variables. To eliminate effects of observable potential confounders, we included the following covariates: sex (0 [] male, 1 [] female; 56.8% female), immigrant status (0 [] born in Switzerland, 1 [] born abroad; 10.4% born abroad), socioeconomic status, assessed by the highest parental international socioeconomic index of occupational status (ISEI; Ganzeboom et al., 1992), which reflects the position of occupations in the social structure and varies between 16.00 and 90.00 (M [] 51.64, SD [] 16.20 in our sample). Moreover, we included the PISA reading score (M [] 530.5, SD [] 80.93) as a proxy for participants’ educational achievement at age 15, and whether participants attended a vocational (0) or a general education track (1; 39.3%).

Data Analyses

We used multilevel models (Raudenbush & Bryk, 2002; Snijders & Bosker, 2012) to predict dropout intentions and dropout as a function of time-averaged self-efficacy and social support, as well as the effects of situational levels (or within-person change over time) in both. We modeled measurement points (level 1), nested within individuals (level 2). Multilevel models allowed us to determine a unique intercept and slope (i.e., growth rate) in dropout intentions and actual dropout for each individual. We centered all the continuous level-2 variables at the grand mean (i.e., time-averaged self-efficacy, time-averaged social support, SES, and reading score). We standardized all continuous variables so that they had an M [] 0 and a SD [] 1. We specified the models as (a) multilevel mixed-effects linear regression to model dropout intentions, and as (b) multilevel mixed-effects logistic regression with QR decomposition to model actual dropout. All models were estimated in Stata Version 15.1 (StataCorp LP, College Station, TX).

We applied maximum-likelihood estimation for both sets of models. This is generally considered to provide robust estimates if the model is specified appropriately. We employed F tests to analyze whether all the coefficients in a model differ jointly significantly from zero. This test assumes equal fractions of missing information (due to nonresponse) for all coefficients.³ We used the same analytical sample to estimate all our models (i.e., identical level 2 units and identical level 1 units), to ensure that differences in estimates across models were not due to different databases.

We included our key research variables—perceived self-efficacy and social support—both at level 2 and at level 1 in our multilevel models. At level 2, we included time-invariant measures of self-efficacy and social support to represent the respective time-averaged levels. We calculated these variables as the average of the perceived self-efficacy and social support scales over the 4-year study period. At level 1, we included these variables as time-varying measures, using person-mean-centered variables, to represent within-person change in perceived self-efficacy and social support. This approach has been advanced elsewhere (Hoffman & Stawski, 2009), and is also known as the hybrid method (Allison, 2009). Figure 1 illustrates the proce-

³ Because we estimated cluster robust standard errors, the use of likelihood-ratio tests for model comparison was not permissible. This is because the likelihood does not take the clustering in our data into account.

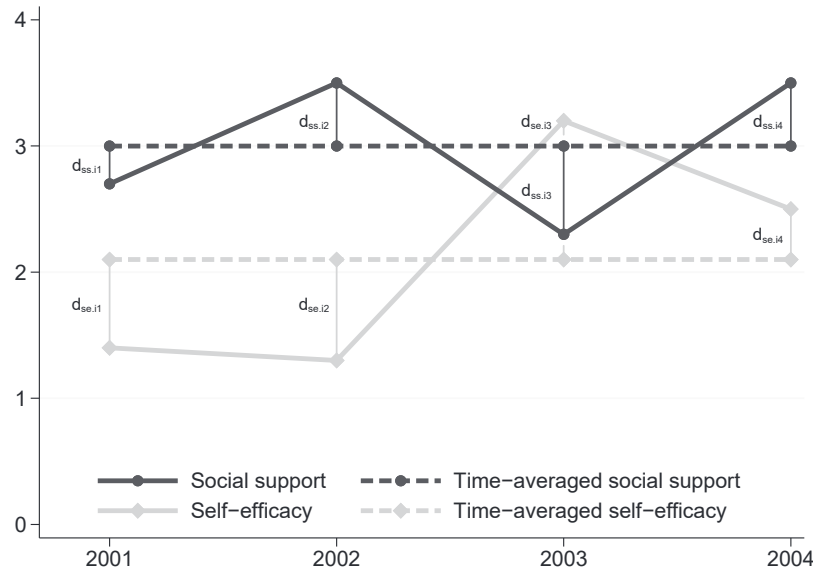


Figure 1. Fictitious example report of the levels of perceived social support and self-efficacy across four panel waves (2001 to 2004; solid lines). Dashed lines represent person-specific means (i.e., time-averaged levels) of social support and self-efficacy; $d_{ss,i1} - d_{ss,i4}$ refer to the deviation (d) from the time-averaged level of perceived social support (ss) in the respective panel wave, 1 through 4; $d_{se,i1} - d_{se,i4}$ refer to the deviation from the time-averaged level of perceived self-efficacy (se) in the respective panel wave.

Figure 1 shows the response pattern of a given respondent *i* across the four panel waves. Respondent *i* exhibits an average social support score of 3.0 and an average self-efficacy score of 2.1 across the 4-year study period. These scores display the respondent's time-averaged level of perceived social support and self-efficacy, respectively (dashed lines). By contrast, the time-varying (situational) levels of social support and self-efficacy are deviations from the person-specific means ($d_{ss,i1} - d_{ss,i4}$ and $d_{se,i1} - d_{se,i4}$, respectively; $d_{ss,i1} - d_{ss,i4}$ refer to the deviation (d) from the time-averaged level of perceived social support (ss) for individual (i) in the respective panel wave, 1 through 4; and $d_{se,i1} - d_{se,i4}$ refer to the deviation (d) from the time-averaged level of perceived self-efficacy (se) in the respective panel wave). For instance, in 2002, the respondent perceived a decrease in self-efficacy ($d_{se,i2}$) relative to his or her time-averaged level of self-efficacy, and, concurrently, he or she perceived more social support ($d_{ss,i2}$) than usual; however, in 2003, the respondent perceived a higher level of self-efficacy ($d_{se,i3}$) and a lower level of social support ($d_{ss,i3}$) than usual.

The distinction between time-averaged and situational level enabled us to analyze the extent to which dropout intentions were influenced by stable person characteristics and/or by within-person change in these characteristics. This distinction was necessary to take into account that there was substantial fluctuation in perceived self-efficacy and social support across the four measurement points: 35.5% of the variance in perceived self-efficacy was within persons (64.5% was between persons), and 48.3% of the variance in perceived social support was within persons (51.7% was between persons), according to the results of unconditional multi-level models with perceived self-efficacy and perceived social support, respectively, as the outcome variables.

We performed four multilevel models for dropout intentions. The first, or null, model only included the outcome variable

dropout intentions. This model was used to partition the variance in dropout intentions into two components: within- and between-person variance. The second model included time as fixed and random effects, and all the time-invariant (level 2) measures, including time-averaged perceived self-efficacy and time-averaged perceived social support. The third model additionally included the time-varying (level 1) variables situational self-efficacy and situational social support. Finally, the fourth model included the interaction terms between perceived self-efficacy and social support at both level 2 and level 1; that is, at the between-person (time-averaged) and within-person (situational) levels. All these models also included random effects: level 2 variance, level 1 variance, and time variance, as well as the correlation between the level 2 variance and the time variance.

We ran an identical set of models with the outcome variable actual dropout. However, all initial models in this second set revealed that the random effect of time was close to zero (all $F(1, 10) < 2.57$), suggesting that there were no significant between-person differences in the development of actual dropout over time. This is because in most cases, dropout occurred only once during the observational period of four years. Hence, for reasons of parsimony, we estimated this set of models without a random effect of time. Removing this time parameter only minimally changed the estimates of the other coefficients.

Results

Table 1 shows the means, standard deviations, and correlations over time for the two outcome variables and the key predictor variables. On average across the four panel-waves, dropout intentions and actual dropout were low, perceived self-efficacy and social support were moderate-to-high, and the occurrence of negative life events was

Table 1
Descriptive Statistics (Means and Standard Deviations) and Correlations Between the Key Variables for the Four Panel Waves

Statistic	Panel wave(s)	Dropout intentions (Min: 1, Max: 7)	Actual dropout (Min: 0, Max: 1)	Self-efficacy (Min: 1, Max: 4)	Social support (Min: 1, Max: 4)	Negative life events (Min: 0, Max: 6)
M (SD)	t ₁	1.76 (1.51)	0.02 (0.13)	2.94 (0.46)	3.31 (0.49)	0.64 (0.89)
M (SD)	t ₂	1.59 (1.24)	0.07 (0.25)	3.03 (0.47)	3.16 (0.58)	0.64 (0.88)
M (SD)	t ₃	1.48 (1.14)	0.03 (0.17)	3.04 (0.46)	3.34 (0.49)	0.60 (0.86)
M (SD)	t ₄	1.56 (1.20)	0.05 (0.23)	2.98 (0.46)	3.34 (0.50)	0.60 (0.87)
r	t ₁ -t ₂	.28	.28	.52	.41	.42
r	t ₂ -t ₃	.27	.17	.59	.45	.38
r	t ₃ -t ₄	.27	.04	.59	.57	.37
r	t ₁ -t ₃	.18	.07	.49	.41	.29
r	t ₂ -t ₄	.15	.03	.51	.40	.29
r	t ₁ -t ₄	.15	.02	.45	.40	.25

Note. Number of participants in the analytic sample across the four panel waves: $n_{(t1)}$ 3699, $n_{(t2)}$ 3805, $n_{(t3)}$ 3295, $n_{(t4)}$ 2433. M mean; SD standard deviation; r Pearson correlation (for continuous variables) and Phi coefficients (for the binary variable Actual dropout), respectively; Min minimum; Max maximum.
p .01. p .001.

low. Dropout intentions and actual dropout were weakly correlated over time; however, self-efficacy, social support, and negative life events were moderately correlated over time.

Dropout Intentions

In our first set of models, we predicted dropout intentions (Null Model and Models 1 to 3 in Table 2). The Null Model, which includes no covariates, partitions the variance in the outcome dropout intentions into a within- and a between-person variance component. This model enabled us to assess the intraclass correlation (ICC); that is, the proportion of total variance between persons. The ICC indicates that 45.6% of the variance in dropout intentions was between persons, whereas 54.4% was within persons.

In Model 1, we added time as fixed and random effects and the time-invariant variables. The main result here is that individuals with above-average levels of time-averaged self-efficacy, and those with above-average levels of time-averaged social support, reported below-average levels of dropout intentions. Moreover, dropout intentions increased with the number of negative life events. Reading scores were further negatively associated with dropout intentions. Sex, immigrant status, parental ISEI, and being in the general education track were not significantly related to dropout intentions. Linear effects of time were not significant. In our model, the person-level random intercept and the random slope of time at the person level were allowed to correlate (correlation between level 2 variance and time variance). This correlation was negative, which suggests that individuals with higher initial levels of dropout intention showed a stronger decrease in dropout intention over time, whereas individuals with lower initial levels of dropout intention exhibited a weaker decrease in dropout intention over time.

In Model 2 we included the time-varying variables situational social support and situational self-efficacy. That is, we added social support and self-efficacy at level 1. The results of this model show that situational social support and situational self-efficacy were significantly related to dropout intentions, over and above time-averaged social support and self-efficacy. In other terms, individuals who perceived more social support than usual, or who perceived higher levels of self-efficacy than usual, were likely to

report fewer dropout intentions, irrespective of their time-averaged levels of social support and self-efficacy, and vice versa.

In Model 3, we included two-way interaction terms between negative life events on the one hand, and, respectively, time-averaged and situational social support as well as time-averaged and situational self-efficacy, on the other hand. This model corroborated the findings of the previous models and further provided evidence of the following significant main effects of the main study variables: on average, an increase in one SD in time-averaged self-efficacy was associated with a 0.06 SD decrease in dropout intentions, and a one SD increase in time-averaged social support was associated with a 0.07 SD decrease in dropout intentions. Moreover, a one SD increase in negative life events was associated with, on average, a 0.11 SD increase in dropout intentions, which corresponds to an average increase of 0.15 SD in dropout intentions per each additional negative life event. Furthermore, a one SD increase in situational self-efficacy was associated with a 0.06 SD decrease in dropout intentions; and a one SD increase in situational social support was associated with a 0.03 SD decrease in dropout intentions. In addition, Model 3 indicates that the effect of negative life events on dropout intentions was attenuated by higher-than-usual self-efficacy. Figure 2 depicts this interaction between the number of negative life events and the level of perceived self-efficacy, using marginal effect analysis. This figure illustrates that the inimical effect of negative life events on dropout intentions was weaker among individuals who perceived higher levels of situational self-efficacy, and even became statistically insignificant for individuals with elevated situational self-efficacy (where the confidence interval includes the null value on the y-axis). As a sensitivity analysis, we added the interaction terms one-by-one to Model 3. This did not lead to different findings.

Actual Dropout

In our second set of models, we predicted actual dropout (Null Model and Models 4 to 6 in Table 3). The ICC based on the Null Model suggests that 17.1% of the variance in actual dropout was between persons, whereas 82.9% was within persons (on the

Table 2
Results From the Multilevel Mixed-Effects Linear Regression Models Predicting Dropout Intentions

Measure	Null model	Model 1	Model 2	Model 3
Time-averaged self-efficacy		.055 (.011)	.055 (.011)	.056 (.011)
Time-averaged social support		.072 (.012)	.073 (.012)	.073 (.012)
Negative life events		.157 (.017)	.156 (.017)	.152 (.017)
Situational self-efficacy			.059 (.009)	.058 (.008)
Situational social support			.025 (.008)	.025 (.008)
Time-Averaged Self-Efficacy \times Negative Life Events				.004 (.012)
Time-Averaged Social Support \times Negative Life Events				.022 (.014)
Situational Self-Efficacy \times Negative Life Events				.040 (.010)
Situational Social Support \times Negative Life Events				.009 (.010)
Time		.010 (.008)	.015 (.008)	.014 (.008)
Female		.036 (.021)	.037 (.022)	.038 (.022)
Immigrant		.035 (.036)	.036 (.036)	.036 (.037)
Parental ISEI		.001 (.010)	.001 (.010)	.002 (.010)
Reading score		.158 (.014)	.158 (.014)	.159 (.014)
General education		.038 (.023)	.040 (.023)	.039 (.023)
Constant	.007 (.010)	.067 (.025)	.077 (.025)	.075 (.025)
Level 2 variance	.533 (.061)	.490 (.059)	.491 (.059)	.491 (.059)
Level 1 variance	.636 (.025)	.639 (.025)	.634 (.025)	.632 (.025)
Time variance	.040 (.008)	.039 (.007)	.039 (.007)	.039 (.007)
Correlation (level 2 variance, time variance)	.709 (.045)	.756 (.040)	.755 (.040)	.755 (.040)
F		46.40	41.77	31.42
Number of level-1 units	13,232	13,232	13,232	13,232
Number of level-2 units	4,956	4,956	4,956	4,956

Note. ISEI = international socio-economic index; standardized coefficients with cluster-robust standard errors. F statistics are equal fraction missing information model tests, each assuming that between-imputation and within-imputation variances are proportional. ICC = .456 (based on Null Model). $p < .01$. $p < .001$.

calculation of the ICC in a multilevel logistic regression, see Merlo et al., 2006, p. 292).

In Model 4, we added time as a fixed effect (Time) as well as the time-invariant variables. A major result here was that experiencing a greater number of negative life events was significantly associated with an increased likelihood of actual dropout. For the sake of

interpretability, we calculated predictive margins in probability scale over the range of observed negative life events. We found that the experience of each additional negative life event was associated with an average 1.3% increase in the probability of dropping out. Time-averaged levels of self-efficacy and social support were not significantly associated with the likelihood of

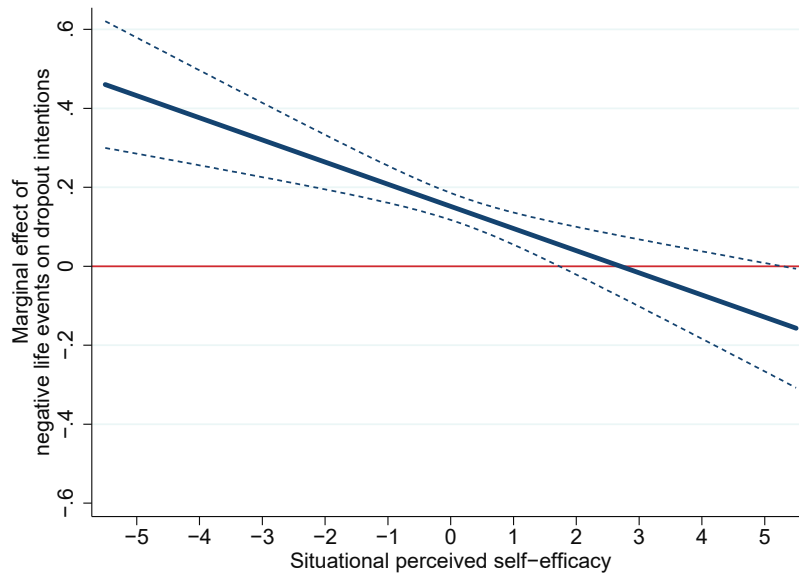


Figure 2. Marginal effect of negative life events on dropout intentions across the range of values of situational perceived self-efficacy, with 95% confidence interval (dashed lines). See the online article for the color version of this figure.

Table 3
Results From the Multilevel Mixed-Effects Logistic Regression Models Predicting the Log Odds of School Dropout

Measure	Null model	Model 4	Model 5	Model 6
Time-averaged self-efficacy		.039 (.049)	.039 (.049)	.049 (.051)
Time-averaged social support		.042 (.051)	.043 (.051)	.068 (.053)
Negative life events		.320 (.044)	.320 (.044)	.312 (.045)
Situational self-efficacy			.001 (.045)	.003 (.047)
Situational social support			.040 (.045)	.057 (.047)
Time-Averaged Self-Efficacy \times Negative Life Events				.018 (.040)
Time-Averaged Social Support \times Negative Life Events				.069 (.040)
Situational Self-Efficacy \times Negative Life Events				.007 (.038)
Situational Social Support \times Negative Life Events				.051 (.039)
Time		.216 (.042)	.218 (.042)	.220 (.245)
Female		.169 (.100)	.169 (.100)	.160 (.100)
Immigrant		.119 (.146)	.121 (.146)	.123 (.146)
Parental ISEI		.061 (.051)	.061 (.051)	.059 (.051)
Reading score		.001 (.057)	.002 (.058)	.000 (.057)
General education		.608 (.115)	.606 (.115)	.609 (.115)
Constant	3.443 (.110)	3.799 (.191)	3.804 (.162)	3.811 (.162)
Level 2 variance	.681 (.172)	.433 (.140)	.432 (.140)	.422 (.138)
F		13.60	11.20	8.51
Number of level-1 units	13,232	13,232	13,232	13,232
Number of level-2 units	4,956	4,956	4,956	4,956

Note. ISEI = international socio-economic index; standardized coefficients (log odds) with cluster-robust standard errors. F statistics are equal fraction missing information model tests, each assuming that between-imputation and within-imputation variances are proportional. ICC = .171 (based on Null Model). Note that in the calculation of the ICC for multilevel logistic regression models, the level-1 variance is fixed at 3.29.

^{***}p < .001.

actual dropout. Further results suggest that individuals in the general education track exhibited a 1.8% lower likelihood of actual dropout than those in a vocational track. Sex, immigrant status, parental ISEI, and individuals' reading score were not significantly associated with the likelihood of actual dropout. The nonsignificant associations of the likelihood of dropout with parental ISEI and individuals' reading score is at odds with theory suggesting that low achievement and low socioeconomic status are among the most persistent risk factors for school dropout (e.g., Alexander et al., 1997, 2001; Christenson & Thurlow, 2004). However, the finding is in line with recent research which suggests that socioeconomic status and other dropout risk indices such as student achievement are not significantly associated with school dropout when considered in combination with further (psychological) stressors such as parental divorce and other significant life events (Dupéré et al., 2015, 2018). Model 4 reveals a positive linear effect of time, indicating that the likelihood of actual dropout increased over time.

In Model 5 we include the time-varying variables situational social support and situational self-efficacy. That is, we added social support and self-efficacy at level 1. Both coefficients were insignificant. The results of this model confirm the previous models.

In Model 6, we included two-way interaction terms between social support, self-efficacy, and negative life events at both the between-person and within-person level. However, none of these interaction terms were significant. Comparing the findings from Model 6 to those from Model 3, we note that negative life events was the only key study variable that was significantly related to both dropout intentions and dropout. None of the other key study variables that turned out to be significant in Model 3 were also significant in Model 6, suggesting that relative to actual dropout,

dropout intentions were more sensitive to (time-averaged and situational) self-efficacy and social support.

As a sensitivity analysis, we ran Model 5 and added the interaction terms one-by-one in separate models. This did not yield different results than those reported in Model 6. In addition, we included dropout intentions as a predictor in the final model (i.e., Model 6). This did not alter the estimates of the other parameters. It showed, however, that a one-SD increase in dropout intentions was significantly associated with, on average, a 0.15-SD increase in the log odds of actual dropout. Finally, we also ran additional sensitivity analyses to determine whether the presence of any given negative life event, rather than the number of negative life events, was associated with dropout (i.e., nonadditive operationalization of negative life events). These analyses corroborated the results presented above.

Discussion

A growing body of research suggests that school dropout is a gradual process in which dropout constitutes the final consequence of a complex period of diminishing school engagement (Archambault, Janosz, Fallu, & Pagani, 2009; Janosz et al., 2008). Only recently have researchers begun to focus on transient psychological states and temporary stressors as the triggers of dropout, thereby acknowledging that some students with a long history of difficulties persevere and finally graduate from school, whereas others decide to withdraw from school not as a consequence of a long process of disengagement but as a result of temporary disruptive life events (Dupéré et al., 2015). Our longitudinal study suggests that both enduring and transitory risk and protective factors may play a role in shaping school dropout intentions (precursors of dropout) and actual dropout. We considered general

perceived self-efficacy and social support as protective factors, and negative life events as risk factors for school dropout intentions and actual dropout. We differentiated time-averaged levels of self-efficacy and social support from within-person change in these characteristics over time, to evaluate whether school dropout intentions and actual dropout are a result of an enduring lack of social support and self-efficacy, or of a temporary loss in the corresponding characteristics. Investigating this topic, we addressed four interrelated research aims. We discuss these and the corresponding findings in turn.

Our first aim was to examine associations between negative life events and dropout intentions as well as actual dropout. Negative life events, such as a severe accident, the death of a close person, or going through an unhappy relationship, may act as stressors and evoke maladaptive responses, thus disrupting normal functioning (cf., Dupéré et al., 2018; Lantz et al., 2005; Luhmann et al., 2012). Indeed, one of the main conclusions of our models was that negative life events were positively associated with the frequency at which individuals considered quitting their school or apprenticeship (dropout intentions). Furthermore, every additional negative life event made it more likely that an individual would effectively quit his or her school or vocational training. These results stand out as we controlled for two vital protective factors—perceived self-efficacy and social support—in our models.

The second aim was to explore the links between perceived social support and dropout intentions as well as actual dropout. Perceived social support has been considered as a protective factor against school dropout intentions and actual dropout (Lagana, 2004; Legault et al., 2006). However, research had not examined the association of changes in perceived social support over time with dropout intentions and dropout. Our models revealed that time-averaged levels of perceived social support were negatively associated with dropout intentions, but not with actual dropout. Moreover, we found a significant negative relationship between situational perceived social support and dropout intentions: higher-than-usual levels of perceived social support were associated with lower levels of dropout intentions, albeit not with a decrease in the likelihood of actual dropout.

Our third aim was to assess whether perceived self-efficacy operates as a protective factor against dropout intentions and actual dropout. It is an established finding that efficacy beliefs affect individuals' aspirations, goals, and perseverance in the face of difficulties and adversities, and prior research has also indicated that time-averaged self-efficacy protects against dropout (e.g., Bandura et al., 2001; Bandura, 1989; Komarraju & Nadler, 2013). Extending this research, we examined how both time-averaged and situational levels of perceived self-efficacy were related to dropout intentions and actual dropout. Although we could not find evidence for a protective effect on actual dropout, both time-averaged and situational perceived self-efficacy were negatively related to dropout intentions. We thus demonstrated the importance of considering within-person changes in psychosocial resources to advance our understanding of the dynamic nature of the drivers of school dropout intentions. Our models provided no evidence of a significant association between time-averaged or situational self-efficacy and actual dropout. These results suggest that the power of efficacy beliefs is limited in preventing dropout behavior, although efficacy beliefs do seem to increase student achievement, motivation, and persistence (Burger & Walk,

2016; Caprara et al., 2011; Diseth, 2011; Komarraju & Nadler, 2013), and they decrease dropout intentions.

As our fourth and final aim, we examined whether the association of negative life events with dropout intentions and actual dropout was moderated by perceived social support and self-efficacy. Although our models did not provide evidence for any moderation effects concerning actual dropout, we found that higher-than-usual self-efficacy reduced (and in some instances completely neutralized) the influence of adverse life events on dropout intentions. This is noteworthy as it suggests that time-averaged levels of perceived self-efficacy cannot prevent the occurrence of dropout intentions. However, when young people feel more efficacious than usual, they will be significantly less likely to think about quitting their school or vocational training even in the presence of negative life events. This result is in line with previous findings indicating that young people report fewer dropout intentions if they feel more optimistic than usual, even when they perceive some level of stress at the same time (Eicher et al., 2014).⁴

Albeit beyond the main focus of our study, we also note that socioeconomic status (ISEI) and reading scores did not significantly predict the likelihood of actual school dropout in our study. This finding contrasts with much prior research which has repeatedly revealed significant effects of low achievement and low SES on the likelihood of school dropout (e.g., Battin-Pearson et al., 2000; de Witte et al., 2013). Our finding might be a consequence of the fact that the dropout measure captured both temporary and permanent dropout, and of the fact that the analytic sample had, on average, higher reading scores than the complete sample. However, our (null) finding also confirms recent evidence showing that low SES and low achievement were not significantly related to the probability of dropping out from high school when these variables were considered in combination with other (psychological) stressors and protective factors such as parental divorce, academic aspirations, subjective appreciation of school, and exposure to significant life events (Dupéré et al., 2015, 2018). Thus, it seems that dropout can be a result of temporary disruptive life events and stressors other than low SES and low achievement. Taken together, such findings provide evidence that dropout does not consistently constitute the endpoint of a long trajectory of academic disengagement and failure, and that in some instances acute stressors (negative life events) may also be significant predictors of dropout.

Limitations and Suggestions for Future Research

Our study had some limitations. First, we considered dropout intentions and dropout; however, we did not distinguish between push, pull, and falling-out factors related to dropout (Doll et al., 2013). Distinguishing between these factors would allow for a more nuanced understanding of the phenomenon, considering the differences between being pushed (when adverse situations in the school environment lead to consequences, which ultimately result in dropout), being pulled out (when factors divert students from completing school, e.g., financial stress), and falling out (when

⁴ Albeit not the main focus of our study, we found that dropout intentions and actual dropout followed different trajectories. On average, dropout intentions did not change over time. However, actual dropout became more likely as time passed.