

Unexpected pathways toward college graduation

Running head: Unexpected pathways toward college graduation

Graduating from college:

Exploring first-semester dispositions and experiences of support associated with
unexpected pathways

(in press in Journal of College Student Retention: Research, Theory & Practice)

Simon Larose, Stéphane Duchesne, & Geneviève Boisclair-Châteauvert

Université Laval

Acknowledgments. The current study was funded by Quebec Ministry of Education
(Contract no. SC-36787). Dr. Simon Larose was the principal investigator of the study
(simon.larose@fse.ulaval.ca)

Abstract

This study examines the dispositions and experiences of support of college students associated with unexpected pathways toward college graduation. The final sample was drawn from a national sample of 3,998 youths who participated in a longitudinal project. Using the k-nearest neighbors' algorithm, we created four groups based on the Québec High School Average and the College Graduation status four years after admission (Unexpected Graduates; Expected Dropouts; Unexpected Dropouts; Expected Graduates). Compared to ED, UG showed lower aggressive behaviors and attentional problems and higher participation in institutional or targeted support measures in college. They were also more likely to have attended a private high school. Compared to EG, UD showed lower academic behaviors and motivation, lower perceptions of teaching quality and support, and lower economic capital and support from family. They were also more likely to enrol in a technical college program and less likely to have attended a private high school.

Keywords: College graduation; high school achievement; academic and social dispositions; academic and social support

Unexpected pathways toward college graduation

Graduating from college: Exploring first-semester dispositions and experiences of support associated with unexpected pathways

Graduation from postsecondary school is a national priority for most industrialized countries. Although the accessibility and graduation rates for postsecondary programs have risen steadily in Canada and other industrialized countries since the turn of the century, almost 45% of young Canadians who entered a technical or professional training program in 2011–2012 failed to graduate four years later, and slightly over 25% of youth enrolled in a four-year university undergraduate program did not earn their degree (Statistics Canada, 2019a; 2019b). In Québec, almost 36% of youth did not obtain a postsecondary diploma (PSD) two years after the expected timeframe for a preuniversity or technical cegep (college) program (Institut de la Statistique du Québec, 2011). This portrait is not unique to Canada. Other industrialized countries show comparable or slightly higher non-graduation rates: 54% for the United States, 47% for New Zealand, and 35% for the United Kingdom (OECD, 2010).

Failure to earn a PSD has significant consequences for both youth and society. The PSD is a recognized passport that provides access to the majority of 21st century jobs (OECD, 2019). Moreover, studies have largely demonstrated that completing postsecondary studies is associated with physical and psychological health indicators such as fewer symptoms of depression, higher self-ratings of health, higher participation in cultural and sports activities, more extended social networks, and higher volunteering (OCDE, 2019; Walsemann et al., 2012). Furthermore, the PSD opens doors to more stable, better paid jobs that come with superior benefits and that generate more taxes at all levels of government, enabling them to invest in improved social programs (OECD, 2019).

Unexpected pathways toward college graduation

Literature review and limitations

Given these advantages, much research has been conducted over the past 20 years to inform decision makers about the personal, family, social, and educational factors that predict graduation with a PSD. One clearly demonstrated finding is that high school achievement is one of the most important proximal determinants for retention in higher education (Raju & Schumacker, 2014; Westrick et al., 2015) and obtention of a PSD (Larose et al., 2015). In addition to prior academic achievement, which is strongly correlated with cognitive skills and knowledge (Millea et al., 2018; Paura & Arhipova, 2014; Stumpf & Stanley, 2002), the obtention of a PSD appears to be strongly influenced by individual dispositions that manifest during the course of postsecondary studies. These include self-determined motivation and feelings of academic competence (Ashraf et al., 2018; Bäumle et al., 2018; Fichten et al., 2014; Jenö et al., 2018; Kappe & Flier, 2012), behavioral, cognitive, and metacognitive learning strategies (Lassibille & Navarro Gómez, 2008; Weinstein & Acee, 2018), peer support strategies and seeking help from teachers (Hu & Ma, 2010; Sáenz, 2017), consumption of illicit substances while studying (Patrick et al., 2013), and social and evaluative anxiety (Gersh et al., 2017; Larose et al., 2018).

Graduation from a postsecondary program is also influenced by external and institutional factors (Credé & Niehorster, 2012). For instance, parental engagement (Ratelle et al., 2005), quality of the teacher–student relationship (Fichten et al., 2014), investments in students services (Carr & London, 2017; Chen, 2012), quality of support provided in the first term (Grillo & Leist, 2013), difficult life events in and outside of college (Cox et al., 2016; Mengo & Black, 2015), and parents' economic capital and educational background (Arias Ortiz & Dehon, 2013; Cox et al., 2016; Ishitani & Desjardins, 2002) appear to play a non-negligible explanatory role.

Unexpected pathways toward college graduation

This systemic portrait of graduation factors is useful for understanding the paths taken by most students. However, field practice has demonstrated the limitations of graduation prediction models. Some at-risk high school students will graduate from college within normal timeframes, and some seemingly well-prepared high school students will never graduate. The present study is concerned with these marginal cases. We narrow the focus to students who follow *unexpected pathways* (i.e., those who graduate from college despite low grades in high school and those who fail to graduate from college despite high grades in high school) (Feinstein & Peck, 2008).

There are several justifications for addressing these marginal cases. First, this reasoning is consistent with the widespread practice of targeting at-risk youth as they enter college, based on their high school grades and aptitude test scores. Although these indicators serve as excellent predictors of postsecondary success, some at-risk youth manage to earn a PSD and some academically strong youth do not. What are the academic and social dispositions of these youth who follow unexpected pathways during the first college term? Could the same dispositions contribute positively to help at-risk youth graduate and at the same time contribute negatively to prevent academically strong students from graduating? From a systemic standpoint, how are academic trajectories influenced by the academic and economic capital that students bring to the table and by the support that they receive from their teachers and the institution? The answers to these questions could help colleges fine-tune their screening methods, improve universal and targeted preventive programs, and better account for the college integration process in youth who defy predictions.

Second, these marginal cases merit our attention because they can enrich theoretical models of graduation by accounting for the resilience and vulnerability processes that operate during the first term of postsecondary studies. Traditional models, such as those proposed by

Unexpected pathways toward college graduation

Tinto (1993), Bourdieu (1986), and Bean and Eaton (2001), seek to identify the factors at play among the greatest number of participants. However, they are less pertinent for clarifying mechanisms of resilience and vulnerability. What internal and external resources enable at-risk students to overcome the negative effects of academic adversity? Inversely, what behaviors and experiences act to undermine students who enter college with a spotless record? The inclusion of resilience and vulnerability factors in theoretical models of graduation, and specifically factors that operate during the first college term, would enable explaining a wider range of individual differences in graduation rates, and hence improve the predictive value of the models.

Objectives and hypotheses

With these questions in mind, the overall objective of this study was to describe the academic and social dispositions and college experiences that differentiate youth who follow an expected academic trajectory from those who diverge. More specifically, we wanted to compare the profiles of Expected Dropouts (ED: non-graduates with low high school grades), Unexpected Graduates (UG: graduates despite low high school grades), Expected Graduates (EG: graduates with strong high school grades), and Unexpected Dropouts (UD: non-graduates despite strong high school grades).

The social ecological perspective (Bronfenbrenner, 2005) guided our selection of predictors. This perspective acknowledges the dynamic interrelationships among various personal factors and the diverse systems (micro-, meso-, exo-, and macro-) in which the student evolves. This model is particularly useful for understanding the interactive role between student dispositions (social, academic, motivational) and support from parents, teachers, and services in predicting graduation. Also, it allows a better appreciation of the complementarity of the sources of support from which the student can benefit. For example, a student might be supported

Unexpected pathways toward college graduation

positively by their teachers, but the effect of this support on graduation might be limited by the lack of support from the family or by negative institutional experiences. Finally, this model makes it possible to understand the challenges of collegial integration by arguing that student adaptation is dependent on systems that are weakened during ecological transitions but whose effects can be mitigated by developmental assets.

Accordingly, we explored the role of academic and social dispositions that are typically associated with achievement (i.e., aggression, inattention, anxiety, motivation, academic beliefs, and learning behaviors) as well as the support they received from their teachers, institution, and family (i.e., academic and economic capital acquired in childhood). In addition, all dispositions and support experiences were measured in the first term of postsecondary studies to account for deflections from the trajectories and to factor in the college's preventive interventions.

Our general hypothesis was that the factors that differentiate the ED from the UG group would differ from those that differentiate the EG from the UD group. We assumed that a resilience process would characterize how some at-risk students graduate (UG), whereas an academic buoyancy process would operate for non-at-risk students who do not graduate (UD). Resilience is defined as the ability to adapt successfully despite adversity (Garmezy & Masten, 1991, p. 151). Academic buoyancy refers to the ability to successfully navigate everyday academic setbacks and challenges that are typical of the ordinary course of school life (Martin & Marsh, 2008). Whereas resiliency would apply only to students who experience severe social or academic adversity, academic buoyancy would apply to students who cope with the normal ups and downs of day-to-day school life, representing a lesser degree of adversity that is characteristic of novel situations and normative life transitions (Martin et al., 2012).

Unexpected pathways toward college graduation

A growing number of studies suggest that these two constructs are relatively independent and are associated with different correlates. For instance, lack of resilience has been found to predict major negative outcomes such as disengagement and self-handicapping behaviors, and lack of buoyancy has predicted low-level negative outcomes like fear of failure and low academic motivation (Collie et al., 2017; Martin, 2013). Based on these theoretical refinements, we predicted that UG would show more resilience, whereas UD would show less buoyancy. Consequently, our specific hypothesis is that graduation by students who were initially at risk would be explained primarily by stable social dispositions that approximate the student's temperament (i.e., low levels of aggression, inattention, and anxiety) and by targeted support received in the first term (i.e., institutional support, academic and economic capital transmitted by parents). In contrast, non-graduation by initially strong students would depend more on malleable motivational and academic factors (i.e., low levels of academic beliefs, learning behaviors, and intrinsic motivation in the first term), and on lack of universal rather than targeted support (i.e., perceptions of teaching and support in class).

Method

Participants and procedure

The study participants were drawn from the EQHR project (Evaluation of the Quebec High school education Reform: Larose et al. 2016; Larose et al., 2019). Conducted from 2004 to 2017, the EQHR project followed 3,998 Québec students from high school entry to the end of college studies. Probability sampling was used to obtain participants from student cohorts who had entered a Québec high school in 2004, 2006, or 2007. The students attended 327 different high schools.

Unexpected pathways toward college graduation

The k-nearest neighbors (KNN) algorithm was used to identify participants who followed unexpected pathways from high school graduation to the end of college studies. The algorithm considered two institutional indicators that were compiled for all participants in the initial sample and provided by the *Ministère de l'Éducation du Québec* (MEQ): the Québec High School Academic Average (QHSAA) and graduation status four years after admission to college. In Québec, the theoretical time to graduate is two years for a preuniversity program (e.g., Humanities) and three years for a technical program (e.g., nursing). The QHSAA is a standardized index based on academic records over the last three years of high school. It has been identified as the best predictor of college success in the province of Québec (Terrill, 1988). Specifically, the algorithm identified the 10 closest neighbors based on the QHSAA for each of the 3,998 participants. Then, it randomly selected the closest neighbor who showed an opposite college graduation status (93% of the matches kept are 1st or 2nd neighbors). This allowed us to create 440 pairs of participants (average distance = 0.000, min = 0.000, max = 0.005). From the median of the QHSAA score, we then created 2 equal groups in size with low QHSAA (Expected Dropouts and Unexpected Graduates) and 2 with high QHSAA (Expected Graduates and Unexpected Dropouts). In fact, the comparison groups have the same QHSAA (UG and ED = 69%; EG and UD = 80%).

Table 1 presents the main sociodemographic and academic characteristics of the final sample (see total sample column). The sample comprised 56% girls and 44% boys. Average age in the first college term was 17.04 years (SD = 0.41). Of the sample, 81% had attended a public high school and 19% a private high school. The majority had been brought up in a biparental family (83%), and most parents had completed postsecondary studies (69% of fathers; 74% of mothers). Median income of the fathers was in the “\$50,000 CAD or more” category, with

Unexpected pathways toward college graduation

Table 1

Characteristics of sample participants as a function of pathways (n=880)

	Total sample % (or <i>M</i>)	Unexpected Graduates (UG: 220)	Expected Dropouts (ED: 220)	Unexpected Dropouts (UD: 220)	Expected Graduates (EG: 220)
Gender					
Boys	44%	41%	48%	48%	40%
Girls	56%	59%	52%	52%	60%
High school sector					
Public	81%	77%	93%	84%	73%
Private	19%	23%	7%	16%	27%
Parental structure					
Two-parents	83%	83%	82%	79%	87%
Others	17%	17%	18%	21%	13%
Father education					
Postsecondary	69%	67%	62%	65%	78%
High school	31%	33%	38%	35%	22%
Mother education					
Postsecondary	74%	72%	62%	74%	85%
High school	26%	28%	38%	26%	15%
Father income					
-20000	6%	6%	8%	4%	6%
20-49999	22%	20%	19%	21%	21%
50000+	72%	74%	73%	70%	73%
Mother income					
-20000	22%	21%	21%	32%	15%
20-49999	29%	26%	40%	27%	26%
50000+	49%	53%	39%	41%	59%
Left the family					
Yes	15%	11%	14%	24%	13%
No	85%	89%	86%	76%	87%
College program					
Pre-university	70%	73%	65%	65%	75%
Technical	30%	27%	35%	35%	25%
Age in college	17.04	17.02	17.02	16.97	16.99
QHSAA	74.5	69	69	80	80

Unexpected pathways toward college graduation

“\$20,000 to \$49,999 CAD” for mothers. Fifteen percent of the youth had left the family home to study at college. Of the sample, 70% had enrolled in a preuniversity college program and 30% in a technical program. The distribution analysis of the inter-pathways will be presented in the results section. Midway through the first college term (October–November), all participants, as well as one of their parents, completed a questionnaire to assess their academic and social dispositions and experiences of the support they received from their parents and institution.

Measures and Indicators

Academic dispositions

Two questionnaires completed by student participants were used to assess academic dispositions. Academic beliefs and behaviors were measured with seven scales selected from the Test of Reactions and Adaptation in College (TRAC) (Larose & Roy, 1995). The TRAC was developed in our lab in accordance with social cognitive theory (Ellis and Grieger; 1978; Beck, 1976). The seven scales are: Fear of Failure [FF; e.g., “I sometimes think that if I fail an exam, I will flunk out of school”; 7 items], Seeking Help from Teachers [SHT; e.g., “I hesitate to ask for help from my teacher when I need to have something cleared up”; reverse coded, 5 items], Assistance from Peers [AP; e.g., “When I’m not sure that I understand a problem or an idea, I ask other students for help as soon as possible”; 4 items], Quality of Attention [QA; e.g., “While studying, I have too many other things on my mind to fully concentrate on the task”; reverse coded, 6 items], Belief in Easiness [BE; e.g., “Certain people obtain excellent grades without truly studying hard”; 4 items], Belief in Effective Work Methods [BWM; e.g., “I believe that it is more important to have good study habits than special aptitudes in order to be successful in college”; 4 items], and Giving Priority to Studies [GP; e.g., “I have difficulty dedicating a lot of time and energy to academic success”; reverse coded, 4 items]. Items were answered on a

Unexpected pathways toward college graduation

seven-point scale (1 = never; 7= always). The TRAC has been shown to have good psychometric properties, including a clear factor structure and good concomitant and predictive validity (see Larose & Roy, 1995). In this study, Cronbach's alphas for the FF, SHT, AP, QA, BE, BWM, and GP subscales were, respectively, .92, .84, .79, .85, .71, .60, and .74.

Academic motivation was measured with two subscales from the Academic Motivation Scale (AMS; Vallerand et al., 1993). Participants had to indicate on a five-point scale (1 = Strongly disagree; 5 = Strongly agree) the extent to which they pursued their studies out of Intrinsic Motivation (e.g., "For the pleasure and satisfaction of learning new things in this program"; 4 items) and Identified Motivation (e.g., "Because I think that this program will help me better prepare for the career I chose"; 4 items). Previous studies have established that the AMS has high reliability and validity (see Vallerand et al., 1993). In our study, internal consistency for the two subscales was .92 (Intrinsic) and .76 (Identified), respectively.

Social dispositions

Social dispositions were assessed with three scales that captured constructs approximating the student's temperament. A parent responded to the first two scales, which were taken from the parent version of the Social Behavior Questionnaire (SBQ; Tremblay et al., 1992). The first scale, called Aggression-disruptiveness, contains 13 items (e.g., My child is disobedient at home; My child gets too angry, has crises, or loses his/her temper often). The second, called Inattention, contains 4 items (e.g., My child can't concentrate or pay attention for very long; My child daydreams or gets lost in his/her thoughts). All items were rated on a three-point Likert-type scale ranging from 1 (Never applies) to 3 (Frequently applies). Concurrent and predictive validity of the SBQ have been supported in previous studies (e.g., Pagani et al., 2001;

Unexpected pathways toward college graduation

Tremblay et al., 1992). The alpha coefficients were .77 for Aggression-disruptiveness and .79 for Inattention.

The students responded to the third scale to assess personal anxiety. We used the Worry-Oversensitivity subscale of the French version of the Revised Children's Manifest Anxiety Scale (Reynolds & Paget, 1983; translated and validated by Turgeon & Chartrand, 2003). It contains 12 yes or no response items (e.g., I have trouble making up my mind; I get nervous when things do not go the right way for me). Turgeon and Chartrand (2003) reported excellent internal consistency for this subscale, and the test-retest reliability after six months was similar to that for the initial administration. Moreover, it showed good concurrent validity, as assessed by correlation with the State-Trait Anxiety Inventory for Children. In our study, the alpha coefficient for the Worry-Oversensitivity subscale was .81.

Experiences of support

Consistent with the social ecological model, we measured support from three sources: the family, the teachers, and the institution. Family support was assessed indirectly from multiple indicators. We created an academic capital index that accounts for the mother's and father's education level (for biparental families), theoretically varying from 1 (elementary school) to 4 (university). We also created an economic capital based on the average annual income of the father and mother. Income was measured on a six-point scale (1 = under \$10,000 CAD; 6 = \$50,000 CAD and over) completed by the parent who responded in the EQHSR project. In the case of biparental families, the parent reported the incomes of both parents. In addition to these two indexes, we included the experience of leaving the family to go to college and the parental structure (two-parents vs others) as two additional indirect markers of family support.

Unexpected pathways toward college graduation

Teaching quality and support was measured with a 28-item questionnaire that included scales that have been validated in the education research (see Creasey et al., 2009; Kardash & Wallace, 2001; Midgley et al., 2000). It contains six dimensions of teaching practices and strategies: 1) mastery climate in class (5 items, Cronbach's alpha = .85: My teachers encourage students to concentrate on the progress they make in class); 2) continuity of learning from high school to college (3 items, Cronbach's alpha = .85: The knowledge that I acquired in high school is useful in my college courses); 3) diversity of evaluation practices (6 items, Cronbach's alpha = .70: My teachers use a variety of evaluation methods); 4) personalized teacher–student relationship (3 items, Cronbach's alpha = .56: I have personalized relationships with my teachers); 5) contextualized teaching (3 items, Cronbach's alpha = .75: My teachers make connections between the learning material and real life); and 6) valorization of understanding (8 items, Cronbach's alpha = .73: My teachers make sure that their students understand the material well). Students responded to all items on a five-point scale (1 = Strongly disagree; 5 = Strongly agree). A total mean score was compiled for the 28 items (Cronbach's alpha = .75) to represent the students' perceptions of the quality of classroom teaching and teacher support in the first college term.

Institutional support was assessed with two yes or no questions, where “yes” was scored as 2 and “no” as 1: 1) Since you started college, have you received any peer tutoring or mentoring services (formal or informal)? and 2) Since you started college, have you received any learning assistance services (e.g., adapted schedule, note-taking support, extra time for exams, local or adapted exam, correction software)? We calculated the mean response to the two questions to obtain an institutional support score that varied theoretically from 1 to 2. This score represents support received from the institution rather than perceived support.

Unexpected pathways toward college graduation

Data Analysis

We performed two series of analyses. First, we used an exploratory contingency analysis (chi-square) and cross-tabulated the comparison groups (UG, ED, UD, EG) with the descriptive categorical variables (see Table 1). More specifically, we compared the profiles of the UG and ED groups and the profiles of the UD and EG groups. Second, to test our main hypothesis (i.e., that the dispositions and experiences of support that differentiate the ED from the UG group would differ from those that differentiate the EG from the UD group), we performed analyses of variance that included academic and social dispositions and the support experience as dependent variables with the pathway as a factor. We defined three orthogonal contrasts along the pathway: 1) comparison between the initially weak (UG and ED) and initially strong (EG and UD) groups; 2) comparison between the UG and ED groups; and 3) comparison between the UD and EG groups. Contrasts 2 and 3 specifically address our hypothesis. Descriptive statistics (mean, standard deviation, percentage, confidence interval, and partial eta squared $-\eta_p^2$ -) were applied to all analyses.

Results

Profiles of unexpected graduates

Columns 2 and 3 of Table 1 present the proportion of participants for sample characteristics as a function of the first two pathways (UG vs. ED). Based on the chi-square value, only one association was significant. A higher proportion of the UG group had attended private school compared to the ED group, $X^2(1) = 14.1, p < .0001$. No other categorical variable differentiated the two groups. Table 2 presents the descriptive statistics of the disposition and support variables for the students in the first college term. The contrast analysis between the UG and ED groups showed

Unexpected pathways toward college graduation

Table 2

Descriptive statistics of dependant variables as a function of pathways

	Unexpected Graduates (UG)		Expected Dropout (ED)		Unexpected Dropout (UD)		Expected Graduates (EG)		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Academic dispositions									
Fear of failure	3.24	1.29	3.42	1.48	3.11	1.57	2.66	1.28	
Seeking help from teachers	4.55	1.07	4.66	1.25	4.58	1.38	4.67	1.38	
Seeking help from peers	4.95	1.17	4.73	1.18	4.61	1.30	5.00	1.20	
Beliefs in faculty	4.05	1.12	3.94	1.15	3.96	1.18	3.80	1.14	
Beliefs in methods	5.59	0.78	5.46	0.81	5.47	0.77	5.61	0.86	
Giving Priority to studies	4.69	1.32	4.44	1.17	4.48	1.19	5.18	1.16	
Intrinsic motivation	3.52	1.08	3.33	1.12	3.58	1.11	3.85	0.92	
Identified motivation	4.30	0.67	4.12	0.89	4.04	0.86	4.49	0.54	
Social dispositions									
Aggressive behaviors	1.35	0.29	1.46	0.32	1.39	0.27	1.37	0.32	
Attentional problems	1.35	0.31	1.48	0.37	1.27	0.29	1.25	0.31	
Anxiety	4.06	3.06	3.96	3.26	4.05	3.23	4.06	3.02	
Experiences of support									
Teaching and support in class	3.59	0.43	3.46	0.55	3.49	0.44	3.67	0.37	
Institutional support	1.22	0.29	1.09	0.22	1.15	0.29	1.11	0.23	
Academic capital	3.06	0.75	2.97	0.76	3.11	0.76	3.21	0.71	
Economic capital	4.82	1.10	4.78	1.29	4.29	1.17	4.72	1.10	

Unexpected pathways toward college graduation

some significant differences. Compared to ED, UG showed lower aggressive behaviors (contrast mean = -0.110; 95% CI: -0.030 to -0.189; $\eta_p^2 = 3.1$) and attentional problems (contrast mean = -0.124; 95% CI: -0.039 to -0.209; $\eta_p^2 = 3.3$), and higher participation in institutional or targeted support measures in college (contrast mean = -0.129; 95% CI: -0.021 to -0.217; $\eta_p^2 = 4.3$). We found no significant differences between the two groups on the academic disposition variables.

Profiles of unexpected dropouts

Columns 4 and 5 of Table 1 present the proportion of participants for sample characteristics as a function of the two other pathways (UD vs. EG). Several associations were significant. Compared to the EG group, the UD group contained smaller proportions of students who had attended a private high school, $X^2(1) = 5.81, p < .01$, and grown up in a biparental family, $X^2(1) = 6.12, p < .01$. Compared to the EG group, they were also proportionally higher to have mother who had an annual income less than \$20,000 CAD, $X^2(2) = 11.51, p < .001$, leave their home and family to attend college, $X^2(1) = 4.80, p < .05$, and be enrolled in a technical program in college, $X^2(1) = 4.18, p < .05$.

In addition, several differences in dispositions and the support experience emerged (see Table 2). Compared to EG, UD showed higher fear of failure during the first college semester (contrast mean = 0.452; 95% CI: 0.075 to 0.829; $\eta_p^2 = 2.4$), lower seeking help from peers (contrast mean = -0.382; 95% CI: -0.053 to -0.710; $\eta_p^2 = 2.2$), lower priority to college studies (contrast mean = -0.700; 95% CI: -0.370 to -1.029; $\eta_p^2 = 8.0$), and lower identified motivation (contrast mean = -0.450; 95% CI: -0.254 to -0.646; $\eta_p^2 = 9.5$). They also reported lower perceptions of teaching quality and support in class (contrast mean = -0.185; 95% CI: -0.045 to -

Unexpected pathways toward college graduation

0.326; $\eta_p^2 = 4.8$), and lower economic capital from their family (i.e., lower family income) (contrast mean = -0.431; 95% CI: -0.064 to -0.799; $\eta_p^2 = 3.4$).

Discussion

The main objective of this study was to determine the factors associated with unexpected pathways toward college graduation. While considering two dynamic processes (resilience and buoyancy) that operate in situations of academic adversity (Garmezy & Masten, 1991; Martin & Marsh, 2008), we investigated personal and ecological factors that could drive college students down divergent pathways. Specifically, based on the ecological perspective (Bronfenbrenner, 2005), we examined students' academic and social dispositions and their experiences of the support they received from parents, teachers, and the institution during the first college term. The results indicate that graduation from college by weak high school students (unexpected graduates: UG) and failure to graduate college by strong high school students (unexpected dropouts: UD) were explained by different factors. In this discussion, we analyze these two distinctive profiles, review the strengths and limitations of the study, and propose some implications of the results for dropout prevention measures.

Academic and social dispositions

In the first college term, the UG group presented more propitious social dispositions: compared to the ED group, their parents felt that they were less aggressive and had fewer attentional problems. Interestingly, no significant difference in these dispositions were found between the UD and EG groups. This supports our general hypothesis that resilience would be more operative in the adaptation process for weaker students who graduated (UG) than stronger students who did not (UD) (Garmezy & Masten, 1991). The aggressive and inattentive behaviors measured in the present study have been strongly associated with temperament, and some

Unexpected pathways toward college graduation

researchers consider them as attributes that raise the risk of maladaptation (Tremblay et al., 2005). Others view these behaviors as diagnostic and clinical features of disorders (e.g., behavioral and attentional disorders) (Martin et al., 1994), of which the negative effects on college adjustment have been well documented (De Paul et al., 2009; Lewandowski et al., 2008). Accordingly, the absence of such behaviors in weak students should act as a resilience factor during the transition to college. In other words, weak students who exhibit attention capacities and show positive social and emotional behaviors have better odds of graduating from college. This suggests that at-risk students would benefit from individualized need-based cognitive and social interventions to improve their resilience at college entry.

We noted also that the academic behaviors, beliefs, and motivations of the UG group did not differ from those of the ED group. On the other hand, some of these factors differed between the UD and EG groups. More specifically, the UD group expressed greater fear of failure, sought less assistance from their peers to resolve problems, placed less priority on their studies, and felt less academically motivated than the EG group. This pattern provides support for our hypothesis that buoyancy would be a weightier (negative) factor in the adaptation process for the strong students who did not graduate compared to the weak students who did. Let us recall that academic buoyancy refers to the student's ability to successfully navigate everyday academic setbacks and challenges (Martin & Marsh, 2008). Studies have shown that this quality is strongly associated with motivation and academic behaviors (Collie et al., 2017; Martin, 2013), and that students generally use it as a strategy to manage normative transitions. Our results therefore suggest that problems of academic motivation, fear of failure, and the inability to call on classmates for assistance in the first college term may lead students who were academically strong in high school to fail or drop out of college. This calls for universal motivational

Unexpected pathways toward college graduation

preventive interventions that focus on students' beliefs, attitudes, and emotions, and which could potentially be conducted in class.

Institutional and teacher support

Compared to the ED group, the UG group made greater use of targeted institutional support at college (e.g., tutorials, mentoring, and support services). Meanwhile, the UD group reported lower perceptions of teaching quality and support in class than the EG group. Universal support in class appeared to be more determinant for graduation by strong students (EG) as opposed to targeted institutional support for weak students (UG). This is consistent with the respective challenges of the two groups. First, the greater use of institutional support by the UG group highlights how peer tutoring, mentoring, and personalized learning assistance services can bolster academic resilience. Such measures are designed to help weaker students navigate the college transition by providing individualized assistance that nudges them toward a more autonomous learning style. Our results suggest that this type of support was effective in the case of the weaker students: it apparently boosted their confidence and equipped them to cope with the challenges of first-year college. Therefore, this type of support should be reserved for weaker students. Second, it is worth noting that the perceived quality of classroom teaching and support acted as a protective factor for the stronger students but had little or no sway over the weaker students. This suggests that a universal approach was insufficient by itself to help the weaker students graduate, perhaps because the support was not individualized. On the other hand, when classroom support was lacking, it may have demotivated the stronger students, resulting in some dropout. It is also plausible that stronger students had higher expectations of their teachers, so that when the teachers failed to live up to them, the disappointment may have had negative repercussions on the students' academic goals and motivation.

Unexpected pathways toward college graduation

Family support

Compared to the EG group, students in the UD group were less likely to have grown up in a two-parent family, more likely to report lower economic capital from their family, and more likely to have left their home and family to attend college. These factors testify to the unstable economic and domestic circumstances of some students. The fact that these factors differentiated strong students who graduated from strong students who did not underscores the risks for academically strong students who do not enjoy financial or instrumental support from their family. In response, institutions and the government could provide financial support for promising students from disadvantaged backgrounds. Moreover, despite good grades in high school, it appears that these students find it difficult to cope with change and instability (e.g., separation, departure). These situations can exacerbate feelings of isolation and insecurity in the first college term, thereby raising the dropout risk. This profile (UD) clearly illustrates that successful completion of postsecondary studies does not depend on intellectual ability alone. It also requires a degree of environmental stability in which to evolve which is coherent with the ecological perspective (Bronfenbrenner, 2005).

Public versus private high school and type of college program

Beyond dispositions and support, the results show that, compared to the ED group, more students in the UG group came out of the private school sector. The same significant difference was observed between the UD and EG groups. These results could be explained in two ways. First, it is possible that the Québec High School Academic Average (QHSAA) earned in the private sector does not have the same significance as in the public sector. In Québec, private schools are more elitist and competitive than public schools. This climate might pressure private school teachers to assess their students more stringently than public school teachers do.

Unexpected pathways toward college graduation

Moreover, due to the more selective admission policies of the private schools, the teachers could have higher expectations for their students, which might be reflected in the marks they assign them. Therefore, an academic average in a public high school could be worth less than the same average in a private high school. Consequently, the private school students would find themselves in an advantageous position once they get to college.

It is equally possible that students from the private sector would have a different experience of peer interactions during the transition than public high school students. In Québec, the public high schools have many more students with learning problems than the private high schools (Gouvernement du Québec, 2012). Therefore, private high school students would have fewer opportunities to assess their abilities relative to students with academic problems. Comparisons between themselves and weaker students would be less extreme than in public high schools, which could diminish their self-confidence. However, once they get to college, they would be cast into a much more heterogenous pool of students, which could inflate their self-confidence. Known as the big-fish-little-pond effect (BFLPE) (March & Parker, 1984), this could partly explain why private high school students, and particularly those at risk, would have greater odds of graduating from college than public high school students.

Furthermore, students in the UD group were more likely to be enrolled in a technical program in college compared to the EG group. It is possible that some of the stronger students who took a technical program were in exploration mode. A high QHSAA opens the door to multiple possibilities, including the option of a preuniversity program, which in turn opens the door to a university degree. Perhaps these strong technical students were more inclined to switch programs than the strong preuniversity students. Consequently, it would have taken them more time to complete college than the four-year period considered in this study. In addition, more of

Unexpected pathways toward college graduation

the strong technical students than the strong preuniversity students could have found a job before they completed college. Many manufacturing and service companies are struggling with manpower shortages, and some lower their job entry requirements and aggressively recruit students from the technical sector even before they graduate (Mayhew et al., 2016). Although this situation is less than ideal for the students, given the less attractive job conditions, it could help to explain why the dropout rate was higher for strong students in the technical compared to the preuniversity stream.

Strengths and limitations

This study has several strengths. It is one of the rare studies to address the unexpected academic pathways of college students. By differentiating between high school students who embark from the same starting point to follow different pathways in college (graduation vs. non-graduation), our findings highlight the contribution of individual dispositions and perceptions of support received in the first college term. Indirectly, they also indicate the dropout mechanisms for students who tend to pass under the radar thanks to a strong QHSAA. Another notable aspect of this study is the large sample size and the wide representativeness, at least in terms of the province of Québec. This allows reliable population inferences.

However, along with these qualities, certain limitations should be considered. First, we included as dropouts, students who had not earned a college diploma two years after the expected end of their program. It is possible that some students would graduate after a longer period or return to college and get their diploma later. We should keep in mind that not graduating is not necessarily synonymous with dropping out. Second, all the assessments of the support received at college were reported by the students themselves. It would be relevant to cross their perceptions with those of teachers and institutional service providers. Finally, the

Unexpected pathways toward college graduation

measures of family and institutional support were indirect (e.g., economic and academic capital), and were based on few items. It would have been more informative to use valid measures to better identify these concepts and control for measurement error.

Implications for research and practice

Our results have several theoretical and practical implications. First, they provide a deeper understanding of the mechanisms at play in graduation from a postsecondary program. The pathways that lead to graduation have many branches that cannot be entirely predicted by either high school marks or intellectual abilities. Our results underscore that the factors for college graduation operate according to different logics for strong and weak students. Whereas social dispositions and perceptions of institutional support appear to play a determinant role in graduation for weaker students (by fostering resilience), the stronger students appear to be more influenced by motivation factors, classroom support, and family background (which foster organization skills). This pattern suggests that weaker students rely on academic resilience to succeed at college (Garmezy & Masten, 1991), as opposed to stronger students, who leverage academic buoyancy (Martin & Marsh, 2008). This calls for the use of different pattern of interventions. Weaker students would benefit more from indicated interventions that include the development of social skills and the presence of individualized support. Stronger students would benefit more from universal interventions in class that target affective and behavioral aspects such as motivation and seeking help from peers: this could help prevent dropout by students who might be overlooked because they performed well in high school.

Let us clarify something here. We are not trying to downplay the importance of affective and behavioral factors or classroom and family support for at-risk students. Instead, we propose that these factors do not enable predicting which of the weaker high school students will fail to

Unexpected pathways toward college graduation

complete a college program. Moreover, we propose that classroom and family support have only limited influence over graduation rates for many students with low high school averages.

With respect to the research, our results call for some fine-tuning of the traditional theoretical models of postsecondary graduation (Tinto, 1993; Bourdieu, 1986; Bean & Eaton, 2001). These models have largely sought to portray the graduation factors for college entrants across the board, with no special attention paid to those at higher risk for dropout or the interventions that target them. Future studies could develop specific models for student populations with low high school grades. The factors for these models could be identified through comparative studies between weak students who graduate (or not) from college, as in the present study. Among others, the factors should include personal resilience and institutional support, which appear to play a major part in the graduation of at-risk students. These models could serve as guidelines for colleges, so they could effectively screen at-risk students based on high school performance and aptitude tests. They could then apply targeted interventions such as tutoring, counselling, and individualized services.

Conclusion

This study shows that the factors for college graduation differ for students who show strong or weak performance in high school. The results indicate two distinct explanatory mechanisms (academic resilience vs. academic buoyancy). Universal preventive measures in the classroom would reduce dropout rates in stronger students, whereas targeted preventive measures would be more effective with weaker students. Further comparative studies (graduation vs. non-graduation), notably in subpopulations of weak high school students, are needed to refine current theoretical models of college graduation and the attendant preventive measures.

References

- Ashraf, R., Godbey, J., Shrikhande, M., & Widman, T. (2018). Student motivation and perseverance: do they explain college graduation? *Journal of the Scholarship of Teaching and Learning, 18*(3), 87-115. <https://doi.org/10.14434/josotl.v18i3.22649>
- Australia Department of Education and Training (2017). *Key findings from the 'Completions rates of higher education students - Cohort analysis, 2005-2015' report*. Australian Government.
https://docs.education.gov.au/system/files/doc/other/key_findings_from_the_completion_rates_of_higher_education_students_-_cohort_analysis_2005-2015_report_0.pdf
- Balzer Carr, B., & London, R. A. (2017). The role of learning support services in university students' educational outcomes. *Journal of College Student Retention: Research, Theory & Practice, 21*(1), 78-104. <https://doi.org/10.1177/1521025117690159>
- Bäulke, L., Eckerlein, N., & Dresel, M. (2018). Interrelations between motivational regulation, procrastination and college dropout intentions. *Unterrichtswissenschaft, 46*(4), 461-479.
<https://doi.org/10.1007/s42010-018-0029-5>
- Beck, A. T. (1976). *Cognitive therapy and the emotional disorders*. International Universities Press.
- Bonanno, G. A. (2005). Clarifying and extending the construct of adult resilience. *American Psychologist, 60*(3), 265-267. <https://doi.org/10.1037/0003-066X.60.3.265b>
- Bronfenbrenner, U. (2005). *Making human beings human: Bioecological perspectives on human development*. Sage Publications.

Unexpected pathways toward college graduation

- Carr, B. B. & London, R. A. (2017). The Role of Learning Support Services in University Students' Educational Outcomes, *Journal of College Student Retention: Research, Theory & Practice*, 21 (1), 78-104.
- Chen, R. (2012). Institutional characteristics and college student dropout risks : A multilevel event history analysis. *Research in Higher Education*, 53(5), 487-505.
<https://doi.org/10.1007/s11162-011-9241-4>
- Collie, R. J., Martin, A. J., Bottrell, D., Armstrong, D., Ungar, M., & Liebenberg, L. (2017). Social support, academic adversity and academic buoyancy: A person-centred analysis and implications for academic outcomes. *Educational Psychology*, 37(5), 550-564.
<https://doi.org/10.1080/01443410.2015.1127330>
- Creasey, G., Jarvis, P., & Knapcik, E. (2009). A measure to assess student-instructor relationships. *International Journal for the Scholarship of Teaching and Learning*, 3(2), 1-10.
<https://doi.org/10.20429/ijstl.2009.030214>
- Credé, M., & Niehorster, S. (2012). Adjustment to college as measured by the student adaptation to college questionnaire: A quantitative review of its structure and relationships with correlates and consequences. *Educational Psychology Review*, 24(1), 133-165.
<https://doi.org/10.1007/s10648-011-9184-5>
- DuPaul, G., Weyandt, L., O'Dell, S., & Varejao, M. (2009). College Students With ADHD. *Journal of Attention Disorders*, 13, 234-250. doi: 10.1177/1087054709340650
- Egeland, B., Carlson, E., & Sroufe, L. A. (1993). Resilience as process. *Development and Psychopathology*, 5(4), 517-528. <https://doi.org/10.1017/S0954579400006131>

Unexpected pathways toward college graduation

Ellis, A., & Grieger, R. (1978). *Handbook of rational-emotive therapy*. Springer.

Feinstein, L., & Peck, S. C. (2008). Unexpected pathways through education: Why do some students not succeed in school and what helps others beat the odds? *The Journal of Social Issues*, 64(1), 1-20. <https://doi.org/10.1111/j.1540-4560.2008.00545.x>

Garmezy, N. (1991). Resiliency and vulnerability to adverse developmental outcomes associated with poverty. *American Behavioral Scientist*, 34(4), 416-430.

Garmezy, N., & Masten, A. S. (1991). The protective role of competence indicators in children at risk. In E. M. Cummings, A. L. Greene, & K. H. Karraker (Eds.) *Life-span developmental psychology: Perspectives on stress and coping* (pp. 151-174). Lawrence Erlbaum Associates.

Gersh, E., Hallford, D. J., Rice, S. M., Kazantzis, N., Gersh, H., Gersh, B., & McCarty, C. A. (2017). Systematic review and meta-analysis of dropout rates in individual psychotherapy for generalized anxiety disorder. *Journal of Anxiety Disorders*, 52, 25-33. <https://doi.org/10.1016/j.janxdis.2017.10.001>

Gouvernement du Québec (2012). *Statistiques de l'éducation, édition 2012*. Québec :
Gouvernement du Québec.

Grillo, M. C., & Leist, C. W. (2013). Academic support as a predictor of retention to graduation: New insights on the role of tutoring, learning assistance, and supplemental instruction. *Journal of College Student Retention: Research, Theory & Practice*, 15(3), 387-408. <https://doi.org/10.2190/CS.15.3.e>

Unexpected pathways toward college graduation

Hartley, M. T. (2012). Assessing and promoting resilience: An additional tool to address the increasing number of college students with psychological problems. *Journal of College Counseling, 15*(1), 37-51. <https://doi.org/10.1002/j.2161-1882.2012.00004.x>

Hu, S., & Ma, Y. (2010). Mentoring and student persistence in college: A study of the Washington state achievers program. *Innovative Higher Education, 35*(5), 329-341. <https://doi.org/10.1007/s10755-010-9147-7>

Institut de la Statistique du Québec (2011). *Taux de diplomation aux études collégiales (DEC, AEC) chez les nouveaux inscrits au collégial (DEC)*. Données fournies et compilées par le Ministère de l'éducation et de l'Enseignement Supérieur, Gouvernement du Québec.

Jackson, D., Firtko, A., & Edenborough, M. (2007). Personal resilience as a strategy for surviving and thriving in the face of workplace adversity: A literature review. *Journal of Advanced Nursing, 60*(1), 1-9. <https://doi.org/10.1111/j.1365-2648.2007.04412.x>

Jeno, L. M., Danielsen, A. G., & Raaheim, A. (2018). A prospective investigation of students' academic achievement and dropout in higher education: A Self-Determination Theory approach. *Educational Psychology, 38*(9), 1163-1184. <https://doi.org/10.1080/01443410.2018.1502412>

Kappe, R., & Van der Flier, H. (2012). Predicting academic success in higher education: What's more important than being smart? *European Journal of Psychology of Education, 27*(4), 605-619. <https://doi.org/10.1007/s10212-011-0099-9>

Unexpected pathways toward college graduation

Kardash, C., & Wallace, M. (2001). The perceptions of science classes survey: What undergraduate science reform efforts really need to address. *Journal of Educational Psychology, 93*, 199-210. <https://doi.org/10.1037/0022-0663.93.1.199>

Larose, S., Duchesne, S., Litalien, D., Denault, A.-S., & Boivin, M. (2018). Adjustment trajectories during the college transition: Types, personal and family antecedents, and academic outcomes. *Research in Higher Education, 60*, 684-710.
<https://doi.org/10.1007/s11162-018-9538-7>

Lassibille, G., & Gómez, L. N. (2008). Why do higher education students drop out? Evidence from Spain. *Education Economics, 16*(1), 89-105.
<https://doi.org/10.1080/09645290701523267>

Lewandowski, L. J., Lovett, B. J., Coddling, R. S., & Gordon, M. (2008). Symptoms of ADHD and academic concerns in college students with and without ADHD diagnoses. *Journal of Attention Disorders, 12*, 156-161.

Marsh, Herbert W.; Parker, John W. (July 1984). Determinants of student self-concept: Is it better to be a relatively large fish in a small pond even if you don't learn to swim as well? *Journal of Personality and Social Psychology, 47* (1): 213–231. [doi:10.1037/0022-3514.47.1.213](https://doi.org/10.1037/0022-3514.47.1.213)

Martin, A. J. (2013). Academic buoyancy and academic resilience: Exploring ‘everyday’ and ‘classic’ resilience in the face of academic adversity. *School Psychology International, 34*(5), 488-500. <https://doi.org/10.1177/0143034312472759>

Unexpected pathways toward college graduation

Martin, A. J., & Marsh, H. W. (2008). Academic buoyancy: Towards an understanding of students' everyday academic resilience. *Journal of School Psychology, 46*(1), 53-83.

<https://doi.org/10.1016/j.jsp.2007.01.002>

Martin, C.S., Earleywine, M., Blackson, T.C. *et al.* (1994). Aggressivity, inattention, hyperactivity, and impulsivity in boys at high and low risk for substance abuse. *J Abnorm Child Psychol 22*, 177–203. <https://doi.org/10.1007/BF02.167899>

Mayhew, M. J., Rockenbach, A. N., Bowman, N. A., Seifert, T. A., and Wolniak, G. C. with Ernest T. Pascarella and Patrick T. Terenzini (2016). *How College Affects Students: Volume 3. 21st Century Evidence That Higher Education Works*. San Francisco, CA: Jossey-Bass.

Mengo, C., & Black, B. M. (2016). Violence victimization on a college campus: Impact on GPA and school dropout. *Journal of College Student Retention: Research, Theory & Practice, 18*(2), 234-248. <https://doi.org/10.1177/1521025115584750>

Millea, M., Wills, R., Elder, A., & Molina, D. (2018). What matters in college student success? Determinants of college retention and graduation rates. *Education, 138*(4), 309-322.

Monto, M. A. & Dahmen, J. (2009). College success among students graduating from public and private high schools. *Journal of School Choice, 3*, 307-312. Doi: 10.1080/15582150903280698

OECD (2010). *Education at a glance 2010*. <http://dx.doi.org/10.1787/888932310149>

OECD (2019). *Regards sur l'éducation 2019 : Les indicateurs de l'OCDE*.

<https://doi.org/10.1787/6bcf6dc9-fr>

Unexpected pathways toward college graduation

- Ortiz, E. A., & Dehon, C. (2013). Roads to success in the Belgian French community's higher education system: Predictors of dropout and degree completion at the Université Libre de Bruxelles. *Research in Higher Education*, 54(6), 693-723. <https://doi.org/10.1007/s11162-013-9290-y>
- Patrick, M. E., Schulenberg, J. E., & O'Malley, P. M. (2016). High school substance use as a predictor of college attendance, completion, and dropout: A national multicohort longitudinal study. *Youth & Society*, 48(3), 425-447. <https://doi.org/10.1177/0044118X13508961>
- Paura, L., & Arhipova, I. (2014). Cause analysis of students' dropout rate in higher education study program. *Procedia - Social and Behavioral Sciences*, 109, 1282-1286. <https://doi.org/10.1016/j.sbspro.2013.12.625>
- Sáenz, V. B., García-Louis, C., Drake, A. P., & Guida, T. (2017). Leveraging their family capital: How Latino males successfully navigate the community college. *Community College Review*, 46(1), 40-61. <https://doi.org/10.1177/0091552117743567>
- Shapiro, D., Dundar, A., Huie, F., Wakhungu, P.K., Yuan, X., Nathan, A. & Bhimdiwali, A. (2017, December). *Completing college: A national view of student completion rates – Fall 2011 cohort*. Signature Report No. 14, National Student Clearinghouse Research Center. https://nscresearchcenter.org/wp-content/uploads/SignatureReport14_Final.pdf
- Statista. (2020). *Higher education graduation rate in the United States from 2000 to 2017*. <https://www.statista.com/statistics/238282/us-higher-education-graduation-rate/>
- Statistique Canada (2019). *Tableau 37-10-0136-02 Diplomation des étudiants inscrits dans un programme menant à un certificat de formation technique ou professionnelle, au Canada*,

Unexpected pathways toward college graduation

selon les caractéristiques de l'étudiant, nouveaux inscrits de 2010-2011 à 2015-2016.

<https://doi.org/10.25318/3710013601-fra>

Stumpf, H., & Stanley, J. C. (2002). Group data on high school grade point averages and scores on academic aptitude tests as predictors of institutional graduation rates. *Educational and Psychological Measurement*, 62(6), 1042-1052. <https://doi.org/10.1177/0013164402238091>

Terrill, R. (1988). *L'abandon scolaire au collegial: Une analyse du profil des décrocheurs* [Dropout in college: Examination of the students' characteristics]. Montreal, Quebec, Canada: Services Régional d'Admission Métropolitain.

Tremblay, R. E. Hartup, W. W., & Archer, J. (2005). *Developmental origins of aggression*. New York, NY: Guilford Press.

Tremblay, R. E., Vitaro, F., Gagnon, C., Piché, C., & Royer, N. (1992). A prosocial scale for the preschool behaviour questionnaire: Concurrent and predictive correlates. *International Journal of Behavioral Development*, 15(2), 227-245.

<https://doi.org/10.1177/016502549201500204>

U.S. Department of Education (2017). *Table 326.10 Digest of education statistics*. National Center for Education Statistics.

https://nces.ed.gov/programs/raceindicators/indicator_red.asp#info

Walsemann, K. M., Bell, B. A., & Hummer, R. A. (2012). Effects of timing and level of degree attained on depressive symptoms and self-rated health at midlife. *American Journal of Public Health*, 102(3), 557-563. <https://doi.org/10.2105/AJPH.2011.300216>

Unexpected pathways toward college graduation

- Weinstein, C. E. & Acee, T. W. (2018). Study and learning strategies (pp. 227-240). In R. F. Flippo and T. W. Bean (editors), *Handbook of College Reading and Study Strategy Research*, New York (NY): Routledge press.
- Westrick, P. A., Le, H., Robbins, S. B., Radunzel, J. M. R., & Schmidt, F. L. (2015). College performance and retention: A meta-analysis of the predictive validities of ACT® Scores, High school grades, and SES. *Educational Assessment*, 20(1), 23-45.
<https://doi.org/10.1080/10627197.2015.997614>