Promoting Postsecondary Education in Low-Income Youth: The Moderating Role of Socio-Behavioral and Academic Skills in the Context of a Major Educational Reform

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Abstract

Governments around the world are pressed to invest in postsecondary education. However, little research exists to document whether large-scale educational reforms aimed at increasing rates of postsecondary attendance benefit youth's developmental outcomes. This study tested whether an educational reform occurring in Québec, Canada, in the 1960s increased educational levels, and whether it benefitted some youth more than others. In the 1970's, 4,109 low-income youth (50% females) aged 7–13 years old were recruited at Time 1 from first, fourth, and seventh grade classes ($M_{age} = 10.6$, $SD = 2.5$). Socio-behavioral characteristics and academic skills at Time 1 were examined as predictors of educational attainment at Time 2, three decades later, on 3,883 of the same participants. Multinomial regressions were used to examine the likelihood of youth obtaining a diploma from the newly created, accessible, and affordable colleges ("cégeps"). Low-educated groups (high school dropouts and high school graduates) presented a higher early risk profile than did college graduates. Interactions revealed that social withdrawal protected youth from disadvantaged neighborhoods, helping them graduate from college. Likeability helped academically weaker girls go beyond college and access university, and helped academically competent boys graduate from college. Aggressive behavior decreased the odds of university attendance for academically competent boys. Policies promoting higher education for disadvantaged youth should be supplemented with early interventions integrating academic and socio-behavioral objectives.

Keywords: academic aptitude, education policy, educational attainment level, protective factors, social behavior, socioeconomic status, youth

Introduction

Obtaining a qualifying diploma has become a major milestone for youth in transition to adulthood around the world, as higher educational attainment is related to benefits in terms of income, employment status, healthy lifestyle and involved citizenship (Ma et al., 2019), and better cognitive (Zahodne et al., 2015), physical, and mental health into old age (Arpino et al., 2018). During the past decade, employment prospects for individuals without postsecondary education have consistently deteriorated among member countries in the Organization for Economic Co-operation and Development (OECD), and this trend is expected to endure (OECD, 2019). Postsecondary education includes programs of study approved by governing authorities (e.g., a department or ministry of education) that are accessible to students after graduating from secondary school, and which will lead to a diploma after students meet their program's requirements. Internationally, universities grant diplomas such as bachelor's, master's and doctoral degrees to students who have already achieved at least a secondary-level education. Many countries also offer postsecondary diplomas through colleges, which are often more accessible than universities because of the lower costs or shorter durations of their programs. Governments from low-, middle-, and high-income countries are pressed to invest in postsecondary education to remain competitive. In industrialized countries like the United States, such investments are expected to bring about economic gains through a reduction of welfare assistance to unemployed individuals, environmental costs, and criminality, and they are also expected to strengthen social capital, democratic civil institutions and political stability (McMahon, 2018). Facilitating access to postsecondary education in low-income countries can streghten their economic growth, their population's capabilities, and their institutions (Oketch et al., 2014). Little is known, however, about how large-scale educational reforms aimed at increasing rates of postsecondary education influence youth's developmental outcomes. This study examined the relative contributions of youth's socio-behavioral traits, academic skills, and socioeconomic context in predicting educational attainment among youth from low-income backgrounds who attended school following a major educational reform in the province of Québec (Canada).

A Life-Course Perspective on the Impact of Educational Policies

Previous research shows a sharp rise of about 3 years of educational attainment in children from socioeconomically disadvantaged families after the Quiet Revolution, as compared with their parents who had attended school before the Quiet Revolution (Véronneau et al., 2015). However, significant inter-individual and socioeconomic variations in educational attainment remained and continue to the present day in the Québec population. Social democratic goals, such as equity, diversity and inclusion, are an important rationale for maximizing the benefits of educational opportunities for all, regardless of family background or individual characteristics. Thus, it is essential to understand the individual and contextual factors that combine and interact to create socioeconomic disparities in educational attainment. This knowledge may inform and guide governing authorities around the world in planning new educational policies to address current and upcoming challenges in the twenty-first century. The conceptual framework for the present research is life-course theory (Elder & Rockwell, 1979; Shanahan et al., 2016), which was used to generate hypotheses about which individuals would benefit most from Québec's Quiet Revolution policies, and conversely, who might be unable to benefit from these enhanced educational opportunities.

According to life-course theory, an individual's life trajectory cannot be disentangled from the broader context in which it takes place. The Concordia Longitudinal Risk Project (henceforth, Concordia Project) was carried out in the aftermath of the Quiet Revolution and provides a unique context to study educational outcomes. This study offers an exceptional opportunity to understand the impact of an education reform on children who grew up with low-educated parents and in disadvantaged neighborhoods, and who would have been unlikely to reach postsecondary education had they entered school before the Quiet Revolution.

Life-course theory also proposes the principle of *human agency* (Goller & Harteis, 2017); that is, individuals play an active role in building their future by making their own decisions. Outcomes are nonetheless contingent on available opportunities in their social, historical, political, and cultural context—which reflects the notion of *contingency* (Crystal, 2020). In many studies, the concept of contingency is tied to obstacles that individuals must manage to move toward the achievement of a

postsecondary diploma, such as a lack of financial resources, distance to higher education institutions (Flannery & Culligan, 2014), lack of social capital to help understand and navigate the education system (Crosnoe & Muller, 2014), cultural dissonance for ethnic minority groups relative to values or practices in academic institutions (Heath & Brinbaum, 2007) or psychological barriers for youth with low socioeconomic status (Jury et al., 2017). Contrary to these studies, the present study tested the contingency principle from a resilience perspective. The education reform during the Quiet Revolution was postulated to alleviate financial, geographical, and other obstacles to obtaining a postsecondary diploma, thus potentiating young adults' human agency in choosing their educational pathway.

Life-course theory also acknowledges the role of individual factors in progressing toward one's goals (Shanahan et al., 2016). Some socio-behavioral tendencies are better suited to a successful progression in the school system than are others. Aggressive youth (Bierman et al., 2013) and those who have difficulty interacting with peers (Rabiner et al., 2016) tend to experience lower academic achievement in school and to interrupt their schooling earlier than do students who are less aggressive and more likeable. Because academic competence correlates with such interpersonal behaviors, these factors should be included together in statistical models.

Mixed results have emerged regarding social withdrawal. Shy children aged 9 to 13 years obtained lower ratings of academic achievement from their teachers than their peers, but no differences were found on their standardized tests of achievement (Hughes & Coplan, 2010). Looking at young adults' regrets about their education or career, withdrawn individuals from selected types (shy, avoidant, mixed-withdrawn) had more regrets than non-withdrawn individuals, but this was not the case for the group of participants from the "unsocial withdrawn" type (Nelson et al., 2020). Also, interactions between academic competence and social behaviors may also lie beneath the surface, and statistical interactions must be part of the models to uncover whether, for example, less adaptive social behavior impinges specifically on academically competent youth's educational outcomes. Likewise, proximal contextual factors, such as neighborhood disadvantage, are likely to interact with individual characteristics in predicting educational outcomes (Shanahan et al., 2016).

Finally, gender is an important predictor to consider when studying educational outcomes. The fact that more women than men have postsecondary diplomas across OECD countries is a new trend with regard to long-term historical perspectives, in that men with postsecondary diplomas outnumbered women with those diplomas for most of the twentieth century (OECD, 2015). Thus, it is important to remain sensitive to obstacles for boys' and girls' educational attainment and to verify how their behavioral tendencies might interact differently with their academic competence and socioeconomic backgrounds to predict postsecondary graduation.

Changing Educational Needs Leading Up to the Quiet Revolution in Québec

In 1951, 65.9% of the Québec population terminated their education with eight years of schooling or less – that is, before even starting to attend secondary school (Dominion Bureau of Statistics, 1953). An additional 28.4% of the population completed nine to twelve years of schooling, which at the time was equivalent to secondary-level studies (Allie, 1982). In total, only 5.6% of individuals who were no longer attending school had ever enrolled in postsecondary studies. In contrast, a secondary school degree, requiring eleven years of education, is currently obtained by 81.7% of Québec youth by the age of 20 years old (MEES, 2020), and 48.4% of adults aged between 25 and 64 years have obtained a postsecondary diploma from a college, a university, or the equivalent (Statistics Canada, 2017). Thus, in the mid-twentieth century, the French-speaking population of the province, which forms the majority group, presented especially low levels of education and only a minority of them were qualified to occupy skilled jobs. If postsecondary education were not made more accessible, the population would have been faced with two major issues: an increase in unemployment among low-educated individuals and labor shortage for occupations requiring a postsecondary diploma (Lacoursière et al., 2011). In addition, economic disadvantage in the majority linguistic group was likely to result in continuing inequity, social unrest, and political instability.

In 1961, an incoming government undertook the task of building a modern education system guided by a report that described the cornerstones of today's education system (Rapport Parent: Government of Québec, 1963–1966), as part of a global sociopolitical reform known as the Quiet

Revolution (in French, *Revolution Tranquille*; Corbo, 2002). The reform was meant to provide society

with the human resources needed for optimal functioning and to ensure that all students had access to the

highest possible education level for their capabilities regardless of financial means, connections, or

geographical location. In 1964, the Ministry of Education was created to design, supervise and coordinate

curricula and educational programs at all levels—responsibilities which were previously held by religious

authorities (Catholic or Protestant, for their respective confessionalities). The ministry had a mandate to

distribute resources equitably and facilitate access to education across socioeconomic and geographic

areas, religious and linguistic groups, and male and female students. The creation of standardized,

university-level teacher education programs also raised the quality of education and increased its

consistency across schools (Corbo, 2002).

The Creation of Colleges

Since the educational reform of the 1960s, high school graduates in Québec have been channeled

into postsecondary institutions known as "cégeps"—an acronym for "general and professional education

colleges" in French. In this study, these institutions are referred to as *colleges*, but it is important to keep

in mind that these postsecondary institutions are not universities. In contrast with most education systems

in North America that separate university-bound students from those who follow a vocational or trade

orientation, colleges in the Québec system grant both technical and preuniversity degrees. The former give

access to specialized occupations on the job market, and the latter prepare students for university

programs.

The low fees for college attendance make it possible for academically competent youth to

complete a technical degree leading to a skilled profession, regardless of their economic background. Pre-

university degrees include the equivalent of a full year of university-level credits and decrease the costs of

a university degree by making it possible to complete an undergraduate program in three years instead of

four (as is the general rule in North America). The educational reform led to the implementation of

colleges and public universities in both large and small urban areas, thus reducing geographic barriers to

postsecondary education. In sum, colleges were an anchor of the education reform, facilitating access to postsecondary education to traditionally underserved populations across the province.

Because obtaining a college diploma has become the typical path to either accessing a quality job or entering university in the province of Québec, it represents the key outcome in this study and was used as a reference category in a multinomial regression framework. College graduation was compared with less desirable outcomes—high school dropout, high school graduation only, college enrollment (without completion)—but also compared with a more advanced outcome, university attendance. The fact that participants came from neighborhoods characterized by low socioeconomic status is a crucial feature of this study because the education reform was aimed at improving educational opportunities primarily in this segment of the population. Thus, both main effects and interactions involving childhood individual characteristics and neighborhood disadvantage were examined in predicting college graduation.

Current Study

This study enabled the assessment of how students' individual and socioeconomic circumstances contribute and interact to predict educational attainment following a significant reform of the education system. It was hypothesized that the new educational policies would lift external constraints and potentiate the impact of socio-behavioral characteristics (i.e., aggression, likeability, and social withdrawal) and academic skills in determining youth's educational pathways. Therefore, it was hypothesized that college graduation and university attendance would be predicted by high academic competence (Hypothesis 1) and likeability (Hypothesis 2) in childhood. In contrast, childhood aggression would decrease the likelihood of graduating from college or attending university (Hypothesis 3). Because past research on social withdrawal has yielded mixed findings, its association with educational outcomes was explored, but without any specific hypotheses associated with this variable.

In general, growing up in a disadvantaged neighborhood was hypothesized to have only a modest relation to participants' educational outcomes, because governmental policies facilitated access to postsecondary education for youth with limited resources (Hypothesis 4). However, some moderation

effects were expected, because the immediate neighborhood might affect academic outcomes more strongly for subsets of at-risk students in this sample, as is described next.

The first moderation hypothesis was that highly aggressive participants in childhood would need more family or community support to be successful in school, thus an interaction between neighborhood disadvantage and aggression was expected (Hypothesis 5). The mixed findings from past research did not allow to make a specific hypothesis about the interaction of social withdrawal and neighborhood disadvantage. However, previous work with a subsample of this study's participants (Kennedy-Turner et al., 2021) suggests that childhood withdrawal protects male participants from disadvantaged backgrounds against engaging in criminal offending in adulthood. Thus, the interaction between these variables was included in the analyses for exploratory purposes.

In addition, associations between children's socio-behavioral skills and educational outcomes were expected to be moderated by their academic potential for postsecondary education. Academic competence was hypothesized to compensate for the risk associated with low likeability (Hypothesis 6) or high levels of aggression (Hypothesis 7) in predicting postsecondary graduation. Finally, gender differences were explored by testing the statistical models separately on males and females and confirming the significance of observed differences in post-hoc analyses.

Methods

Because this study is part of the larger Concordia Project, parts of this section have been presented in a previous manuscript (Véronneau et al., 2015). More detailed information about the project's inception is available in a previous publication (Schwartzman et al., 1985).

Design and Procedures

Participants were originally recruited between 1976 and 1978, when they were aged 7–13 years and attending French-language public schools serving low-income, inner-city neighborhoods of Montréal, Québec, Canada. Results from standardized educational testing were obtained from official records at the end of the academic year in which the participants were recruited, but only for those whom the research team planned to follow up based on the screening. Specifically, investigators at this early stage of the

study intended to focus primarily on participants whose scores on aggression and withdrawal were relatively high, and included about half of the study participants. Because this pattern of missing data was embedded in the study design and is directly related to measures of aggression and withdrawal that are also included in the statistical models, relatively unbiased estimates can be achieved in the primary analyses, as further explained below in the **Preliminary Analyses** section. Educational attainment was measured from archived official records indicating the most advanced level of studies completed by participants by their mid to late 30s. The institutional human research ethics committee approved the original study and each of the following data collections.

Participants

Initiation of the Concordia Project and identification of the original sample. In the school years 1976–1977 and 1977–1978, the Concordia Project began with the screening of 4,109 French-speaking school children (excluding special education classes) in Grade 1 (born in 1969–1970), Grade 4 (born in 1966–1967), and Grade 7 (born in 1963–1964). Prior to recruitment, each school board, school administration, and parent–teacher committee approved the study. Parents were informed about the study through letters, and participation in the screening was entirely voluntary. More than 95% of the students consented to participate. Participants came primarily from French-speaking families: 95% were of European descent and 5% from other ethnicities (e.g., Haitian, Vietnamese, North African), which was representative of the population of low-income neighborhoods of the city at the time. Following initial screening, 1,770 children were selected for inclusion in an intensive longitudinal study, including approximately equal numbers of boys ($n = 861$) and girls ($n = 909$) across all grade levels. Academic competence data were available only for this subsample. Educational attainment data were available for 3,859 out of 4,109 original participants (1,921 boys and 1,928 girls).

The mean age of the total sample at the time of recruitment was 10.23, $SD = 2.61$. Although there was a relatively wide age range among participants at the first assessment, they were combined into a single sample for the analyses considering that age-normed measures were used, such that children's ratings were in relation to same-age peers. Furthermore, a comparison of correlations among study

variables before and after partialling out the effect of age revealed that these associations were not

influenced by participants' age, which was also used as a covariate in the main analyses.

Measures

Neighborhood disadvantage. This variable was assessed in reference to the original year of recruitment

(1976–1978). Block-enumerated census tract data (Statistics Canada, 2001) provided the following

sociodemographic information: percentage of households within the immediate neighborhood of the

family residence in 1976 (a) headed by a single parent, (b) with total household income below the poverty

line, (c) whose head of household had less than a Grade 10 level of education, and (d) whose head of

household was unemployed (Roos et al., 2004). These scales were combined into a single composite

score. Factor loadings for these components were .870 (single parenthood), .922 (low income), .647 (low

education), and .912 (unemployment). Sampling adequacy was .742. High reliability was achieved, alpha

= .933. The neighborhoods where participants lived were rated as significantly disadvantaged on all

components except the last one (i.e., head of household being unemployed).

Socio-behavioral skills in childhood. The children were rated on the dimensions of aggression, social

withdrawal, and likeability by means of a French translation of the Pupil Evaluation Inventory (PEI:

Pekarik et al., 1976), a peer-nomination instrument. The PEI consists of 34 items that load onto the three

factors detailed below (aggression, withdrawal, likeability). Scale scores are highly reliable, typically

greater than .90, including internal consistency coefficients, split-half comparisons, and test–retest

measures (Pekarik et al., 1976; Schwartzman et al., 1985). The number of nominations received by each

child within a class was summed to compute the aggression, withdrawal, and likeability scores, based on

the above-mentioned factors. Scores were standardized within gender and classroom to control for gender

differences and class size in base rates of each factor. This procedure enabled appropriate comparisons of

each child against relevant norms for gender and age. A more extensive description of the original

methodology and characteristics of the sample is available from previous publications (Schwartzman et

al., 1985; Hastings et al., 2020). The aggression and withdrawal scales of the PEI were validated (Lardon

& Jason, 1992) in relation to teacher reports of externalizing and internalizing dimensions (Achenbach &

Edelbrock, 1983). Serbin et al. (1987) also validated these scales in relation to quantitative observational measures of children's behavior.

Aggression. This scale of the PEI includes 20 items measuring behaviors such as disrupting the classroom, being physically aggressive, and seeking attention. Sample items include "those who are mean and cruel toward other children" and "those who fight all the time and get into trouble." The scale is highly reliable, with an alpha coefficient of .975.

Social Withdrawal. This scale includes nine items measuring observable tendencies to be withdrawn, shy, and oversensitive. Items in this scale include "those who are too shy to make friends easily" and "those who usually don't want to play with others." The scale reaches high reliability, with an alpha coefficient of .920.

Likeability. This scale includes five items measuring popularity among peers and social competence. Likeability items include "those who are liked by everyone" and "those who are especially nice." High reliability was established for this scale, with an alpha coefficient of .900.

Academic competence. Assessments of children's skills in mathematics and French first-language (reading and writing) were obtained from the results of standardized achievement testing by the school board in the year of the children's identification for the project. Scores are reported in stanines, with a population mean of 5 and a standard deviation of 1.

Educational attainment. Records of education were obtained for most of the participants from the original screening procedure (3,859 out of 4,109) indicating the highest level of education that had ever been undertaken or completed by each participant by 2006, when participants ranged in age from 34 to 40 years and were assumed to have completed their formal education. The original categories were recoded to obtain adequate meaningful groups of participants, which yielded the following categories: high school dropout, high school graduation, college enrollment without completion, college graduation, and university attendance (see Table 1). The last category included both university completers and non-completers because numbers were too low to keep them separate.

Procedures

At its initiation, the study was approved by the research committee of the school boards and by the administration and the teachers' and parents' committees of each school. Subsequently, Concordia University's internal review board approval was obtained each time data collection was carried out.

Initiation of the study (between 1976 and 1978). Within each classroom, boys and girls were rated on the PEI (Pekarik et al., 1976) in separate administrations. Children were asked to nominate as many as four boys and four girls in their class (from class lists) who best matched each item representing aggressive, likeable, or withdrawn behaviors. At the end of the school year, standardized achievement scores were obtained from the school board.

Procedures for obtaining educational attainment information. The data were drawn from comprehensive archived educational records (Québec Ministry of Education) and used with permission from the access to information commissioner (*Commission d'accès à l'information*).

Analytic Strategy

Because of the categorical nature of the outcome, multinomial logistic regressions were performed using the Mplus software, version 8 (Muthén & Muthén, 1998–2017). Although an ordinal logistic regression model might seem appropriate because of the ordered categorical outcome, the statistical assumptions underlying the proportional odds model were too constraining (Liang et al., 2020). In fact, it was important to allow for differential predictions from the independent variables in relation to various outcome categories (educational attainment level), in which case the multinomial logistic regression is preferable. In this framework, a specific reference group needs to be selected, and college graduates were the best choice for this study because the goal was to verify which participants were most likely to graduate from these newly created institutions. The estimator was maximum likelihood with robust standard errors, and missing data were handled with the full information maximum likelihood (FIML) strategy. Using the mixture modeling "known class" option made it possible to generate estimates for each gender separately, and subsequently tested for significant gender differences in post-hoc analyses.

Results

Preliminary Analyses

Descriptive statistics and correlations are available in Table 2, separately for males and for females. One set of correlations differed across gender: a small correlation emerged among girls, revealing that higher levels of aggression were associated with higher levels of withdrawal, whereas these variables were not significantly correlated for boys.

Neighborhood disadvantage did not correlate with childhood social behaviors but was negatively correlated with boys' and girls' academic competence. Furthermore, older boys and girls lived in more disadvantaged neighborhoods. This may be because participants recruited in Grade 7 had transitioned to secondary school upon recruitment, in contrast with participants recruited in Grades 1 or 4, who were in elementary schools. Because secondary and elementary schools do not serve the exact same neighborhoods, it appears that the participating secondary schools served relatively more disadvantaged areas than did the elementary schools. This explanation is consistent with the small but significant negative association between age and academic competence—a strong correlate of neighborhood disadvantage.

For informational purposes, correlations between the ordinal dependent variable, education level, and the continuous predictors were computed. Aggression and neighborhood disadvantage correlated negatively with education, whereas likeability and academic competence correlated positively with the outcome, for girls and for boys. The negative correlation between withdrawal and education was significant only for girls.

Missing data were very scarce (less than 1% for childhood behaviors and about 6% for education level) because using peer nomination reports and government records made it possible to gather data for most participating children. The one exception is the academic competence variable, which is missing for 56% of the sample because of the initial study's screening procedure (see the **Design and Procedure** section above). Because the pattern of missing data is anchored in the study design and directly related to other variables included in the model (that is, aggression and withdrawal), the FIML procedure (Enders, 2010) should provide relatively unbiased estimates in the primary analyses (Lee & Shi, 2021).

A series of *t*-tests were performed on continuous variables to test for gender differences. Because the social behavior variables had already been standardized within gender, no differences emerged for aggression, withdrawal, and likeability. Girls presented higher academic competence, $t(2564, 22) = -3.70$, $p < .001$. No gender differences emerged for neighborhood disadvantage and age at recruitment. A chi-square test revealed gender differences in educational outcomes, $\chi^2(4) = 50,16$, $p < .001$. Males were more likely than females to belong to the high school dropout category, whereas females were more likely to belong to the college graduate and to the university enroller/graduate groups (see Table 1).

Primary Analyses

Multinomial regressions were performed separately on males and on females, with college graduates as a reference group. Thanks to the selected missing data management strategy, these analyses could be performed on 3,883 participants out of the original 4,109. When gender differences were observed (i.e., when a coefficient was significant for participants of one gender but not the other), follow-up with a multiple group analysis were performed to ascertain their significance. A chi-square difference test ($\Delta\chi^2$) was used to compare a model in which the coefficient was constrained to equality across gender with a model wherein this coefficient was unconstrained.

Standardized regression coefficients are presented in Table 3 for main effects and for significant interactions, which were probed one by one in the main-effect model. Three interactions were tested between neighborhood risk and each measure of childhood behavior (aggression, withdrawal, likeability). Three interactions involving childhood academic competence and each measure of childhood behavior were also tested. Nonsignificant interactions are omitted for concision.[1]

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[1] Because the initial study design involved the collection of academic competence data for only 770 males and 800 females, complementary analyses were performed using the listwise deletion technique, thus retaining 1,570 youth (38% of the original sample). The overall pattern of results was similar. Academic competence, which was the strongest predictor of educational outcomes in our primary analyses, yielded highly similar results. The other predictors became weaker, which is expected with the reduced statistical power and variance due to the selection of a non-representative subsample for these analyses. In fact, participants in the subsample had been over-selected based on high levels of aggression or withdrawal. Thus, results of the analyses conducted with 3,883 participants using the FIML technique to handle missing academic competence data were preferred.

Main effects. For all main effects, odds ratios (ORs) in Table 3 provide effect sizes. When comparing the less-educated groups with college graduates, the most striking differences emerged for the high school dropout participants, as expected. Males and females from this group were more aggressive, less withdrawn, less likeable, weaker academically, and raised in more disadvantaged neighborhoods than were college graduates. Older participants were less likely to drop out of high school than were their younger counterparts.

When comparing college graduates with high school graduates, aggression and withdrawal were no longer significant predictors. However, likeability and academic competence were significant, and as expected, differences decreased as the educational gap among comparison groups got smaller. In addition, girls who terminated their schooling after graduating from high school came from more disadvantaged neighborhoods than those who obtained a college diploma, whereas this was not the case for boys. This gender difference was significant, $\Delta\chi^2(1) = 4.24$, $p < .05$.

When comparing college enrollers with college graduates, likeability was the only consistent and significant predictor across gender: college graduates had been more likeable as children than college enrollers. In addition, among males, college enrollers had apparently been less socially withdrawn as children than were college graduates, but only at the trend level. Withdrawal was not a significant predictor among females, and the gender difference could not be confirmed, $\Delta\chi^2(1) = 2.46$, *ns*. Aggression did not distinguish college enrollers and graduates, for either males or females.

More-pronounced gender differences were revealed when examining academic competence and neighborhood disadvantage. Boys who had only enrolled in college were weaker academically than were college graduates, but this was not the case for girls. This gender difference was significant, $\Delta\chi^2(1) = 8.24$, $p < .01$. Furthermore, growing up in a disadvantaged neighborhood played out in opposite ways for males and females. Neighborhood disadvantage increased the likelihood of girls' enrolling only in college, whereas this childhood experience increased the likelihood of boys' graduating from college. This gender difference reached significance, $\Delta\chi^2(1) = 17.37$, $p < .001$. One more gender difference arose at the trend

level, $\Delta\chi^2(1) = 2.90$, $p = .09$: girls who were older at recruitment were less likely to leave college without

a diploma than were younger girls, whereas age at recruitment did not play a role for boys.

Finally, girls who attended university were rated as significantly more aggressive than those who

only graduated from college. This gender difference reached the trend level, $\Delta\chi^2(1) = 3.33$, $p = .07$. Social

withdrawal, likeability, academic competence, and neighborhood risk were equivalent for college

graduates and university enrollers/graduates. For both genders, participants who were older at the time of

recruitment were more likely to terminate their studies after obtaining a college diploma than to go to

university.

Interactions. Table 4 presents an overview of simple slope analyses[2]. The slope of the predictor was

estimated at one standard deviation above and below the mean of the moderator (Hoffman, 2014). The

visual depiction of interactions is presented in Figure 1.

Neighborhood disadvantage as a moderator. The interaction between neighborhood disadvantage and

social withdrawal was significant for girls and for boys but involved different outcomes. For males,

withdrawal decreased the likelihood of school dropout, as compared with college graduation, but only for

participants from disadvantaged neighborhoods. For the university enrollment/graduation outcome, results

of simple slope analyses were not significant, thus the interaction was not interpretable.

Among females, being socially withdrawn increased the likelihood of graduating from college

instead of receiving only a high school diploma, again for those who grew up in disadvantaged

neighborhoods. In addition, aggression increased girls' risk of receiving only a high school diploma

instead of graduating from college, but only when they grew up in disadvantaged neighborhoods.

Academic competence as a moderator. Among males, being likeable as a child appeared to play a

facilitating role particularly for those who were academically competent, in that it increased the odds of

graduating from college instead of only graduating from high school or only enrolling in college (without

graduating). In contrast, for academically competent boys, aggression increased the probability of only

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[2] We also explored the interaction between childhood aggression and likeability, but the follow-up analyses of simple slopes were not significant. This analysis was deemed inconclusive.

graduating from college, instead of going to university. Among girls, being likeable played a protective role, in that it increased the odds of enrolling in or graduating from university for those with lower academic competence in childhood.

Discussion

While governments are pressed to facilitate access to postsecondary education in low-, middle-, and high-income countries, there is little empirical research to document the long-term impacts of large-scale educational reforms, and whether some segments of the population benefit more (or less) from such reforms. This study sought to provide insights into the educational outcomes of youth displaying various risk or protective factors, by seeking to identify who was most likely to graduate from the new postsecondary college programs (either three-year professional or two-year pre-university) that were created as part of the major educational reform that took place in Québec, Canada, in the 1960s.

It was hypothesized that academic competence (Hypothesis 1) and likeability (Hypothesis 2) would predict a higher likelihood of postsecondary graduation, while the opposite would be true for aggression (Hypothesis 3). Hypotheses 1 and 2 were supported for males and females: academically competent and likeable youth took advantage of the reform and were more likely to obtain a postsecondary diploma. High aggression did predict a higher likelihood of dropping out of high school rather than graduating from college for males and females (Hypothesis 3), and the exploratory analyses revealed that low withdrawal was also a predictor of high school dropout. In addition, several interesting interaction effects involving both aggression and withdrawal emerged. Thus, results associated with these predictors are complex and are further discussed below.

It was also hypothesized that neighborhood disadvantage would have a relatively small association with educational outcomes (Hypothesis 4), compared with past findings, because governmental policies facilitated postsecondary access for participants from lower socioeconomic backgrounds. This hypothesis was supported for males: socioeconomic disadvantage had little to do with their likelihood of postsecondary graduation. In contrast, socioeconomic disadvantage was the main determinant of females' postsecondary graduation.

Regarding moderation hypotheses, the results partly corroborated Hypothesis 5, in that aggressive girls who grew up in disadvantaged neighborhoods were indeed more likely to terminate their studies after graduating from high school rather than obtaining a college diploma. However, no significant interaction emerged for males. In addition, exploratory analyses involving the interaction between withdrawal and neighborhood disadvantage showed that withdrawal protected youth from disadvantaged neighborhoods. In those neighborhoods, boys presenting higher levels of withdrawal were more likely to graduate from college than to drop out from high school, and girls presenting higher levels of withdrawal were more likely to graduate from college than to terminate their schooling after their high school graduation, as compared to more outgoing peers.

The interaction found between likeability and academic competence revealed an unexpected pattern of results. Although it was hypothesized that academic competence would be protective for youth who lacked likeability (Hypothesis 6), results rather showed that being likeable was a protective factor for girls with low academic competence, and it helped them attend university. Furthermore, in contrast with this hypothesis, likeability did not protect at-risk boys, but it helped those with high academic potential to obtain a college degree.

Similarly, significant interactions were found between aggression and academic competence (Hypothesis 7), but results were not as expected. In fact, academic competence was not a protective factor for aggressive youth. Instead, aggression impeded academically competent boys' ability to attend university. However, aggression did not prevent them from obtaining a college diploma (professional or pre-university). Furthermore, results obtained for females were opposite to expectations related to Hypothesis 7, as aggression increased girls' likelihood to attend university, suggesting that some aggressiveness may have contributed to higher educational attainment.

Differentiating College Graduates from Other Groups

Obtaining a college diploma has become the typical path to accessing a quality job or entering university in Québec, thus it was relevant to understand how college graduates differed from less-educated groups. Secondary to this objective, differences between college graduates and university

enrollers/graduates were investigated. As expected, college graduates differed from high school dropouts on all childhood predictors, and fewer differences emerged when comparing increasingly educated groups to college graduates. Thus, in the context of governmental policies that facilitate access to postsecondary education, children who display academic, behavioral, and social challenges still have difficulty accessing postsecondary education. This finding indicates that more-intensive and individualized academic support is needed for children with these problems during the course of their schooling for them to obtain a postsecondary degree. In addition, because likeability was the only predictor that consistently distinguished college graduates from all less-educated groups across genders, it appears that social and emotional competence is crucial along the path to postsecondary graduation.

Gender Differences

Females who enrolled in college but did not graduate were no weaker academically during childhood than those who graduated. In contrast, males who finished college were more academically competent than college enrollers who did not graduate. Thus, factors other than academic talent played a more significant role for girls. This inconsistency may stem from the gender difference observed in the association between neighborhood disadvantage and educational outcomes. Among males, growing up in a disadvantaged neighborhood was a risk factor only for high school dropout, whereas neighborhood disadvantage affected females' education through college graduation. Boys who were able to finish high school tended to go further in their studies when their academic potential allowed them to do so, at least until college graduation, regardless of socioeconomic challenges. Coming from a disadvantaged neighborhood increased the odds of graduating from college for males, instead of dropping out of college; thus, the prospect of moving out of poverty may have increased their motivation to graduate. It could be that many male participants had internalized the then-prevailing expectations that men should be financially independent and support their families. Religious authorities who had been in charge of public schools until the 1960s had promoted such gender expectations for many years before the Quiet Revolution, and their influence endured even after the implementation of the educational reform. The influence of gender norms may be particularly visible in this overall low-income sample because of

participants' awareness that their families' resources were limited, thus they could not depend on others if they were unable to secure a financially viable occupation.

In contrast, females who were able to get into college did not tend to persist in school as far as their academic potential enabled them to go. The socioeconomic and cultural contexts in which they grew up may have taken a toll on their ability to graduate and move out of poverty. Again, gender norms may be at play. In line with the lifepath promoted by influential religious authorities, some may have decided to raise children instead of pursuing their degree. Further, low-income families experience more stress (e.g., health issues, job losses), and females are traditionally expected to care for others in need instead of looking after their own interests. Also consistent with the gender norms explanation, females who were perceived as aggressive by their peers in childhood—a stereotypically masculine behavior—were more likely to attend university than were less aggressive girls. However, females who attended university did not differ from their peers on withdrawal, likeability, and academic competence, and they did not come from higher socioeconomic backgrounds. Because the peer-rated measure of aggression was standardized within gender, the thresholds for girls to be nominated as "aggressive" were not high. Perhaps determination and assertiveness, which could be equated with aggressive behavior by peers, were necessary for females in this socio-historical context to reap the benefits of facilitated access to education after the Quiet Revolution. In sum, even if there has been a shift in college graduation and university enrollment favoring females following the secularization of education, many women did not fulfill their academic potential. Governments could create programs that challenge cultural norms regarding women's roles in society as a way to empower females to achieve their academic goals. Future studies on younger cohorts should verify whether some level of "aggressiveness"—or perhaps assertiveness—still facilitates females' university attendance after the recent evolution of gender norms in Québec (Baillargeon, 2014).

To summarize, boys with strong academic potential who came from disadvantaged neighborhoods made good use of the facilitated access to postsecondary education. In contrast, academically talented girls seemed to be held behind by social, contextual, and cultural obstacles that were inherent to growing up in a disadvantaged context, unless they behaved in a way that was perceived as "aggressive" by their peers in

childhood. Violating gender norms may have contributed to reaching the highest level of education observed in this sample.

Risk and Protective Factors

As hypothesized, living in a secure neighborhood decreased the risk for aggressive females to terminate their schooling without a college degree. Also, exploratory analyses regarding social withdrawal suggested that in the context of disadvantaged neighborhoods, withdrawal might be a protective factor, helping youth obtain a college diploma instead of dropping out of high school (for males) or getting only a high school degree (for females). It seems plausible that for youth growing up in disadvantaged settings, socially withdrawn behavior could translate into more time spent alone, and possibly into a developing more studious habits than their outgoing peers, thus contributing to higher educational attainment.

Results also suggest that likeability played a protective role, helping academically weaker females enter university instead of settle for a college diploma. Among boys, likeability improved the prospects of graduating from college for those who displayed high academic competence, thus enhancing outcomes for males who had high potential. Interactions helped to nuance the main effect model and showed that a combination of strengths (academic competence and likeability) is not just additive; having both multiplies the odds of positive outcomes for boys. In contrast with likeability, academic competence did not act as a buffer for at-risk boys. Instead, competent boys who were more aggressive were less likely to attend university than those who were less aggressive.

A key finding is that childhood aggression works differently in influencing girls' and boys' educational pathways. The risk of not going to college among aggressive females could be tempered when social and financial resources are available to channel their "aggression" (or perhaps assertiveness, or drive) into positive activities—sports, debate team, etc. After entering college, the risk associated with aggression was detected only among boys. Assuming that participants were mostly first-generation postsecondary students, it could be that high social support was necessary to finding their way into college or university, perhaps through the mentoring of a teacher, a relative, or an older peer. Aggressiveness

could get in the way of developing relationships or might lead mentors to steer a young man away from university because they perceive a mismatch between his behavior and the academic environment.

Strengths, Limitations, and Future Directions

This study presents many strengths. The longitudinal design spanning up to three decades, the large sample and high statistical power, and the timeliness and relevance to educational reforms in many developing and industrialized countries make this research particularly valuable. Collecting data from external sources (peers, school records, government records) provided more-reliable data than self-reports, which are subject to recall and social desirability biases and to higher frequency of missing values. One exception is the measure of academic skills, which presented a high rate of missing data. Nevertheless, the pattern of missing values was predictable and the FIML procedure that was implemented is among the most efficient strategies under this condition, yielding results that are less biased than other procedures, such as single imputation or listwise deletion (Enders, 2010). Another limitation is that no information was available about the type of college diploma participants obtained. This information would have been valuable to determine the readiness of college graduates for the job market. In fact, only technical programs prepare students for a job; graduating from a preuniversity program may be problematic for youth who did not attend university afterwards. It should also be noted that all predictors were measured in childhood, so the evolution of participants' socio-behavioral characteristics, academic skills, or socioeconomic context could not be taken into account when predicting educational outcomes. Replications with more-recent cohorts and with students from other parts of the globe are needed to corroborate this study's conclusions. Future research should verify whether the improvement in educational prospects among participants were passed along to their children, and under which conditions.

Conclusion

Little is known as to whether youth's personal strengths, challenges, or socioeconomic context influence the extent to which they can benefit from educational opportunities provided by governments efforts to promote postsecondary graduation. Results from this study showed that following a major reform that led to the creation of accessible postsecondary colleges in the province of Québec, boys and

girls with high academic competence presented a higher probability of graduating from these colleges than academically weaker youth. These findings suggest that governments should allocate resources for early screening of students in need of additional academic support. Providing appropriate services from elementary through postsecondary schooling to youth at risk for school failure because of learning disabilities, attention disorders, or similar conditions should be seen as an investment because students with special needs who obtain a diploma are more likely to sustain their financial independence later on. This study also showed that high levels of aggression in childhood generally increased the risk of terminating school without obtaining a college degree, whereas high levels of likeability increased the likelihood of college graduation. Although past results regarding childhood social withdrawal had yielded mixed findings, results from this study revealed that it generally acted as a protective factor within this generally low-income sample. Together, these findings suggest that the ability to get along with peers and presumably with teachers might be a decisive factor in one's educational success. Early screenings should be implemented to assess socioemotional competence, which can be improved with intervention programs. Such programs, which mostly focus on children, should be adapted for adolescent and young adult students to support academic success through postsecondary studies.

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Table 1. *Proportion of Participants for Each Outcome Category*

	Males		Females		Standardized residuals
	N	%	*N*	%	(*Z*-scores)
High school dropout	735	38.1	567	29.4	3.3***
High school graduate	352	18.2	357	18.5	0.1
College enroller	426	22.1	418	21.7	0.2
College graduate	340	17.6	469	24.3	3.2**
University enroller/graduate	78	4.0	117	6.1	2.0*

*Note. *p* < .05. **p* < .01. ***p* < .001.

Table 2. *Correlations and Descriptive Statistics*

Variables and descriptives	1	2	3	4	5	6	7
1. Aggression	—	−.04†	−.20***	−.26***	.00	.01	−.24***
2. Withdrawal	.06**	—	−.06*	−.18***	.00	.01	−.01
3. Likeability	−.16***	−.14***	—	.35***	.02	−.01	.26***
4. Academic competence	−.26***	−.27***	.49***	—	−.22***	−.11**	.40***
5. Neighborhood disadvantage	.01	.00	.00	−.24***	—	.16***	−.19***
6. Age	.00	.01	.00	−.09*	.18***	—	−.01
7. Education level[a]	−.16***	−.06*	.26***	.44***	−.19***	−.04	—
Males							
Mean	.00	.01	.02	4.41	−.02	10.66	—
Standard deviation	.96	.96	.96	1.57	.99	2.56	—
Skewness	.71	.62	.35	.28	.67	−.24	—
Kurtosis	−.13	.32	−.05	−.11	−.13	−1.32	—
Valid *N*	1936	1936	1936	770	1940	1941	—
Females							
Mean	.00	.00	.01	4.72	−.02	10.51	—
Standard deviation	.97	.97	.96	1.72	1.00	2.53	—
Skewness	.98	.70	.44	.18	.54	−.16	—
Kurtosis	.47	.06	−.32	−.33	−.38	−1.30	—
Valid *N*	1942	1942	1942	800	1941	1942	—

Note. [a]Education level is a categorical, ordinal variable. Correlations should be interpreted with caution.

Correlation coefficients for the male subsample are presented above the diagonal and for the female

sample, they are presented below. Scores of aggression, withdrawal, likeability, and neighborhood

disadvantage are standardized.

†*p* < .10. **p* < .05. ***p* < .01. ****p* < .001.

Table 3.

Multinomial Regression Results

Predictor	High school dropout				High school graduate				College enroller				College grad	University enroller or graduate			
	β	95% CI	*OR*	95% CI	β	95% CI	*OR*	95% CI	β	95% CI	*OR*	95% CI	—	β	95% CI	*OR*	95% CI
Males																	
Aggression	.36***	[.18, .54]	1.43	[1.19, 1.71]	.11	[−.80, .29]	1.11	[0.92, 1.34]	−.06	[−.25, .13]	0.94	[0.78, 1.14]	—	−.06	[−.34, .22]	0.94	[0.71, 1.25]
Withdrawal	−.19*	[−.37, −.01]	0.83	[0.69, 0.99]	−.09	[−.27, .10]	0.92	[0.77, 1.10]	−.15†	[−.32, .03]	0.86	[0.72, 1.03]	—	.05	[−.24, .33]	1.05	[0.79, 1.39]
Likeability	−.40***	[−.59, −.21]	0.67	[0.55, 0.81]	−.20*	[−.40, .00]	0.82	[0.67, 1.00]	−.17†	[−.36, .01]	0.84	[0.70, 1.01]	—	−.07	[−.35, .21]	0.93	[0.70, 1.23]
Academic	−.72***	[−.91, −.53]	0.49	[0.40, 0.59]	−.54***	[−.74, −.34]	0.58	[0.48, 0.71]	−.32**	[−.51, −.12]	0.73	[0.60, 0.89]	—	−.10	[−.38, .19]	0.93	[0.69, 1.20]
Neighborhood	.30***	[.13, .47]	1.35	[1.14, 1.60]	−.05	[−.23, .13]	0.95	[0.80, 1.14]	−.19*	[−.36, −.01]	0.83	[0.70, 0.99]	—	−.19	[−.50, .13]	0.83	[0.61, 1.13]
Age	−.09**	[−.15, −.02]	0.92	[0.86, 0.98]	.04	[−.02, .11]	1.05	[0.98, 1.12]	.01	[−.05, .07]	1.01	[0.95, 1.07]	—	−.09†	[−.19, .00]	0.91	[0.83, 1.00]
Neigh × With	−.16†	[−.33, .01]	0.85	[0.72, 1.01]	−.04	[−.21, .12]	0.96	[0.81, 1.13]	−.09	[−.29, .10]	0.91	[0.75, 1.11]	—	−.31*	[−.59, −.03]	0.73	[0.55, 0.97]
Academic × Agg	.02	[−.16, .19]	1.02	[0.85, 1.18]	−.04	[−.21, .13]	0.96	[0.81, 1.14]	.03	[−.15, .22]	1.03	[0.86, 1.24]	—	−.28*	[−.51, −.05]	0.75	[0.60, 0.95]
Academic × Like	−.08	[−.27, .11]	0.93	[0.77, 1.12]	−.26**	[−.46, −.07]	0.77	[0.63, 0.93]	−.18*	[−.35, .00]	0.84	[0.70, 1.00]	—	.07	[−.15, .28]	1.07	[0.87, 1.32]
Females																	
Aggression	.24**	[.08, .40]	1.27	[1.09, 1.49]	.14	[−.03, .30]	1.14	[0.97, 1.34]	.05	[−.11, .21]	1.05	[0.90, 1.24]	—	.27*	[.04, .51]	1.32	[1.05, 1.66]
Withdrawal	−.15†	[−.31, .01]	0.86	[0.73, 1.01]	−.07	[−.23, .09]	0.94	[0.80, 1.10]	.04	[−.11, .19]	1.04	[0.89, 1.21]	—	.01	[−.21, .24]	1.01	[0.81, 1.27]
Likeability	−.30***	[−.48, −.12]	0.74	[0.62, 0.88]	−.20*	[−.39, −.02]	0.82	[0.68, 0.98]	−.24*	[−.43, −.06]	0.78	[0.65, 0.95]	—	−.04	[−.31, .22]	0.96	[0.74, 1.24]
Academic	−.65***	[−.82, −.48]	0.52	[0.44, 0.62]	−.36***	[−.52, −.19]	0.70	[0.60, 0.83]	−.02	[−.19, .16]	0.98	[0.82, 1.17]	—	.13	[−.08, .35]	1.14	[0.92, 1.42]
Neighborhood	.40***	[.25, .55]	1.49	[1.28, 1.74]	.20*	[.04, .36]	1.23	[1.05, 1.44]	.30***	[.14, .45]	1.35	[1.16, 1.57]	—	.05	[−.19, .29]	1.05	[0.82, 1.34]
Age	−.05†	[−.11, .01]	0.95	[0.90, 1.01]	.01	[−.05, .07]	1.01	[0.96, 1.07]	−.06*	[−.12, −.01]	0.94	[0.89, 0.99]	—	−.09*	[−.18, −.01]	0.91	[0.84, 0.99]
Neigh × Agg	.09	[−.08, .25]	1.09	[0.93, 1.28]	.19*	[.02, .36]	1.21	[1.03, 1.43]	.08	[−.09, .24]	1.08	[0.92, 1.27]	—	.02	[−.23, .28]	1.03	[0.79, 1.32]
Neigh × With	−.07	[−.22, .08]	0.93	[0.80, 1.08]	−.16*	[−.32, −.01]	0.85	[0.72, 1.00]	−.10	[−.25, .04]	0.90	[0.78, 1.05]	—	−.15	[−.40, .09]	0.86	[0.67, 1.10]
Academic × Like	−.08	[−.23, .06]	0.92	[0.80, 1.06]	−.02	[−.15, .12]	0.98	[0.86, 1.12]	−.09	[−.24, .05]	0.91	[0.79, 1.05]	—	−.23**	[−.39, −.06]	0.80	[0.68, 0.94]

Note. Academic = Academic competence. College grad = College graduate. Neigh = Neighborhood. With = Withdrawal. Agg = Aggression. Like = Likeability. College graduates represent the reference group. *OR* = odds ratio. CI = confidence interval.

†$p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

Table 4. *Simple Slope Analysis of Two-Way Interactions*

Moderator × Predictor	Outcome category	Gender with significant interaction	β for simple slopes
Neighborhood Disadvantage ×			
Withdrawal	HS dropout	Males	Low: −.02 High: −.36**
Aggression	HS graduate	Females	Low: −.04 High: .36**
Withdrawal	HS graduate	Females	Low: .07 High: −.25*
Academic Competence ×			
Aggression	University	Males	High: −.61* Low: .34
Likeability	HS graduate	Males	High: −.51** Low: .39
Likeability	College enroller	Males	High: −.35** Low: .24
Likeability	University	Females	High: −.22 Low: .51*

Note. HS = High school. Outcome categories are all compared with the reference group comprised of college graduates. In the last column, slopes are for participants who are 1 *SD* below (low) or above (high) the mean on the moderator. Positive beta weights indicate that a higher value of the predictor increases the likelihood of belonging to the outcome category indicated in the second column (rather than being a college graduate), whereas negative beta weights indicate a decrease in likelihood.

*p < .05. **p < .01.

Figure 1

Depiction of Interaction Effects
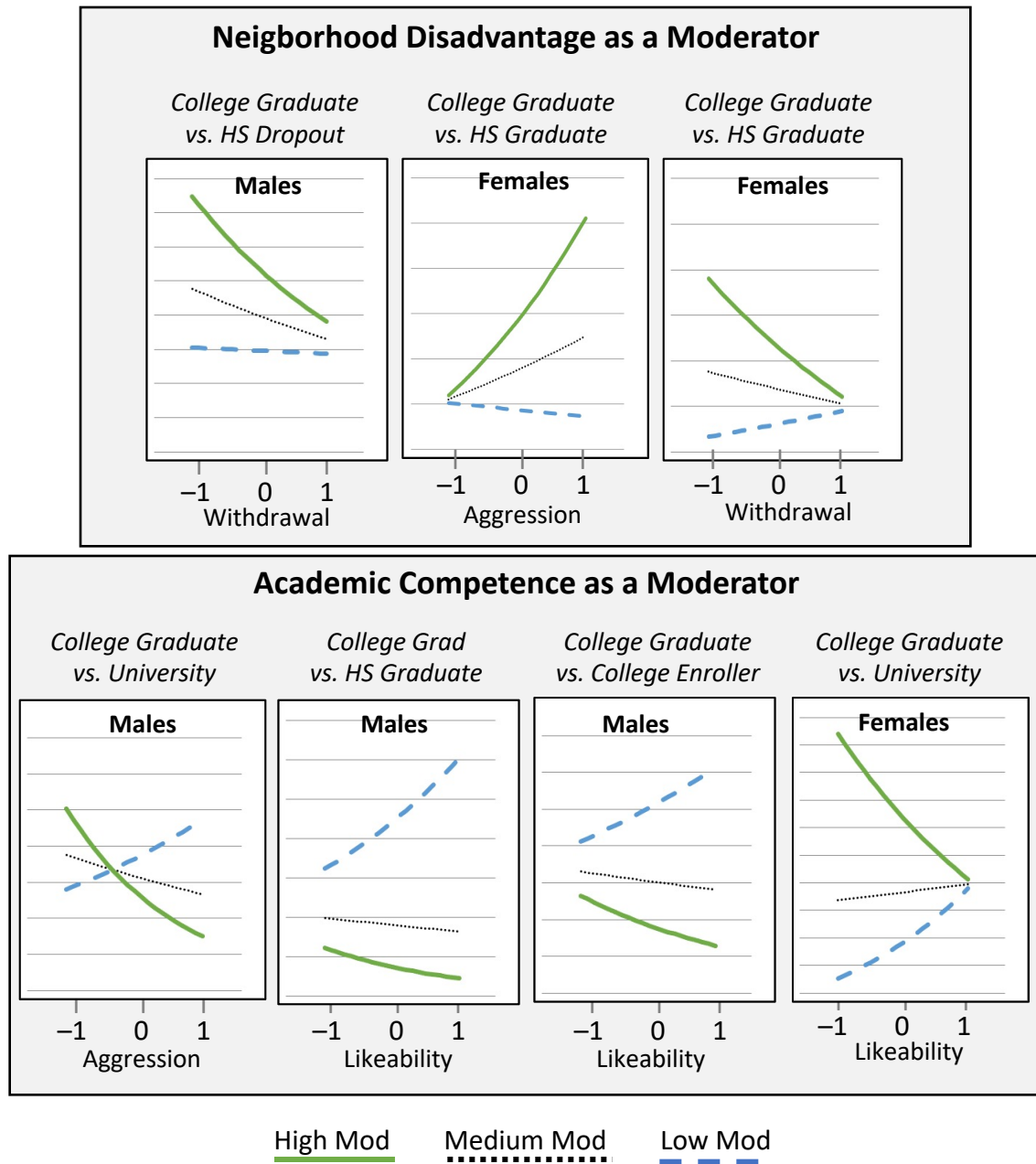
Note. Visual depiction of the interactions described in Table 4. Mod = Moderator. High and low values of

the moderators are at one standard deviation above and below the mean. Values on the X axes represent

standard deviations of the independent variable.