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# Language Brokering Conditions the Indirect Association Between Mexican-Origin Adolescents' Academic Discrimination and Educational Expectations

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## ABSTRACT

Mexican-origin adolescents, a significant portion of the US Latino population, often experience a decline in educational expectations from early to late adolescence. Contextual factors such as academic discrimination and language brokering for parents may contribute to this decline. This study investigates the indirect effect of academic discrimination experienced in middle school on educational expectations in young adulthood through high school grades and engagement, and the moderating role of language brokering experiences in these relations. Data were collected from 604 Mexican-origin adolescents across four waves from 2012 to 2023. Academic discrimination experiences in middle school were negatively associated with school grades in high school, which in turn were associated with lower educational expectations in young adulthood. A positive relationship with parents tied to language brokering functioned as a buffer, while stress from language brokering with parents exacerbated the association between academic discrimination and high school grades. The findings highlight the need to reduce academic discrimination experiences early in adolescence to prevent its long-term cascading adverse educational outcomes. Language brokering experiences offer new insights into how experiences in the family context converge with academic discrimination to have a lasting influence on academic outcomes in Mexican immigrant households.

## 1 | Introduction

Mexican-origin children, who represent a significant portion of the Latino population in the United States, start middle school with high educational expectations as early adolescents (Perez-Brena et al. 2017). Yet, Mexican-origin young adults show lower educational attainment relative to other Latinx young adults in the United States (Hernandez and McElrath 2023). Discrimination has been identified as a key factor for understanding such disparities in academic achievement among Mexican-origin adolescents (Berkel et al. 2010). Academic discrimination, including discrimination from peers and teachers in the school context, may be a factor contributing to the lower educational expectations of Mexican-origin adolescents (Benner and Graham 2013). Many Mexican-origin adolescents also engage in familial responsibilities during high school, such as language brokering, where they translate and interpret between Spanish and English for their English-limited parents (Kim et al. 2020). Although over 80% of Mexican-origin children act as language brokers (Chao 2006), there is limited information on how this bilingual practice together with academic discriminatory experiences influence their future academic outcomes long-term. It may be that adolescents with positive language brokering experiences are protected from the negative repercussions of academic discrimination on their long-term educational outcomes, while the opposite may be the case for those who feel stress from language brokering, such that academic discrimination relates to cascading adverse educational outcomes.

Discriminatory experiences in school are demonstrated to lower Latino adolescents' high school grades (Benner and Graham 2013). Experiences of academic discrimination, which can include being wrongly disciplined or getting after-school detention, may lead Mexican-origin students to have a negative perception of the school environment (Brown 2015). In the long term, experiences of academic discrimination may lower students' academic motivation and lead students to have lower post-high school educational expectations (Schafer 2023). Given the limited research examining the long-term consequences associated with academic discrimination, the current study investigates Mexican-origin adolescents' academic discrimination in middle school on high school grades and school engagement, and in turn educational expectations in young adulthood. Additionally, the current study also examines whether experiences in language brokering conditions the indirect association between academic discrimination and educational expectations. Prior research has identified that immigrant-origin youth often face multiple acculturation-related hassles, including language hassles and discrimination hassles (Titzmann et al. 2011), but few studies have explored how these immigrant-specific hassles may operate together to influence academic outcomes. Furthermore, while language brokering is often framed as a source of stress and burden, it can also foster positive experiences, such as enhanced self-efficacy and a sense of competence. These positive language brokering experiences may attenuate the negative association between academic discrimination and educational expectations (Kim et al. 2024). As such, the current study tests whether positive relationships with parents tied to language brokering may mitigate, or whether stress from language brokering may exacerbate, the pathway from academic discrimination to high school grades and engagement, and to educational expectations in young adulthood. This indirect association is tested twice, to account for adolescents' varying language brokering experiences for mothers versus fathers (Kim et al. 2022). By examining the interplay between academic discrimination and language brokering experiences, it becomes possible to better understand the family-school dynamics specific to challenges facing Mexican-origin children within schools and as language brokers within the family, to better understand how the two together relate to understand their future educational expectations.

### 1.1 | Academic Discrimination and Educational Expectations

Representing a large and fast growing racial/ethnic group in the United States, Latinos' enrollment in higher educational institutions has increased (Hernandez and McElrath 2023). Mexican-origin children show high educational expectations when entering high school with 67% of them expecting to obtain at least a bachelor's degree and at least 55% expecting to do so when transitioning out of high school (Lawson et al. 2020). Despite having such high educational expectations, only 15% of Mexican-origin individuals report receiving a bachelor's degree compared to 41.9% of non-Latinos (Moslimani et al. 2023; United States Census Bureau 2022).

Given that more than 80% of Latinos report facing discrimination at school (Gonzalez et al. 2014), academic discrimination may be an important factor to consider to reduce its long-term negative consequences on their future educational expectations (Schafer 2023). Academic discrimination can involve Latino students hearing assumptions from teachers and peers about their intelligence or being looked upon as the exception when excelling in school (Fisher et al. 2000). Children may experience academic discrimination as early as fourth grade, and by the time children reach adolescence, academic discrimination becomes a frequent experience in their lives (Brown 2015). At least one study has longitudinally linked early adolescents' awareness of societal discrimination to high school Grade Point Average (GPA), and in turn educational attainment in young adulthood (Wheeler et al. 2020). Yet, there is limited information on how early experiences of academic discrimination specifically have long-term consequences on influencing Mexican-origin adolescents' future academic outcomes. Thus, this study utilizes discriminatory experiences that are specific to the academic domain to test for the long-term educational challenges Mexican-origin adolescents may face in terms of educational expectations as young adults.

### 1.2 | Academic Discrimination to School Engagement/School Grades to Educational Expectations

While studies have demonstrated that racial and ethnic discrimination impact Mexican-origin adolescents' academic outcomes in middle and/or high school (Benner et al. 2018), it is

important to investigate academic discrimination specifically as it is more closely related to the academic domain such as school grades, school engagement, and educational expectations. Among middle school students, discriminatory experiences in school may negatively impact interest and effort towards schoolwork such as school engagement (Civitillo et al. 2024b) and academic performance indicators such as school grades during high school (Berkel et al. 2010). As high school progresses, students with lower grades and low school engagement may show a diminished sense of self-efficacy (Berbery and O'Brien 2018) and a loss of motivation to achieve good grades. Mexican-origin adolescents with low school engagement may therefore become less invested in their future educational goals (Wang and Eccles 2012) and may come to believe that their high school academic performance does not meet their earlier educational aspirations, ultimately lowering their post-high school educational expectations (Lawson et al. 2020; May and Witherspoon 2019). Indeed, academic expectations have been shown to evolve in response to students' academic achievement over time; for example, students' achievement in 8th grade predicted their expectations of highest educational attainment in 12th grade (Zhang et al. 2011). Considering that high school academic performance and school engagement are important in fostering future higher academic expectations (Gong and Toutkoushian 2024), it is important to examine whether Mexican-origin adolescents' academic discriminatory experiences in middle school negatively impact their school grades and school engagement during high school, and eventually their post-high school educational expectations.

### 1.3 | Language Brokering Conditioning the Pathway from Academic Discrimination to School Engagement/High School Grades, and Educational Expectations

Over 71% of Mexican-origin individuals without bachelor's degrees report family obligations as a reason for not being enrolled in school (Mora 2022). To help their non-English speaking parents, many Mexican-origin adolescents assume the task of language brokering, a responsibility that involves translating and interpreting for their parents (Kim et al. 2017). In the process of language brokering, Mexican-origin adolescents support their parents in practical ways, such as interpreting at medical appointments, assisting with financial decisions, or translating school-related materials. While providing such instrumental support offers adolescents opportunities for the acquisition of new skills, it may also expose them to their parents' emotional experiences. These two aspects of brokering, instrumental support and emotional exposure, can have distinct implications for adolescent development. Specifically, providing instrumental support may reduce the time available for academic tasks, and balancing brokering responsibilities with schoolwork can increase adolescents' stress. Additionally, exposure to parental emotions may contribute to increased stress and emotional fatigue (Titzmann 2011). Language brokering may also allow adolescents to develop close relationships with their parents as they take on a significant role in the family and hold a sense of responsibility for the family (Kim et al. 2017). However, being a language broker can also lead to role reversal within the family, which can strain the relationship between adolescents and parents (Umaña-Taylor 2003) and lead to negative emotions (Weisskirch 2007), which may lower adolescents' grades, reduce school engagement, and diminish educational expectations.

Given these different aspects of language brokering, it would be important to examine the role of both positive and negative brokering experiences (for mother and father). This is especially relevant during high school, a period when many Mexican-origin adolescents continue to broker for their parents on a regular basis. Going beyond past studies on direct associations between language brokering experiences and academic outcomes, it is also possible that language brokering experiences may moderate the indirect association from academic discrimination in middle school and educational expectations in young adulthood. For example, positive brokering experiences (e.g., close relationships with mothers or fathers tied to brokering) may buffer, while negative brokering experiences (stress of language brokering for mothers or fathers) may amplify the negative effects of discrimination on high school grades and school engagement, which may further influence educational expectations in young adulthood.

The proposed conditional indirect association may be different across fathers versus mothers. For example, translating for fathers, particularly in diverse contexts, has a more harmful effect on adolescents' stress responses (diurnal cortisol slopes) compared to translating for mothers (Kim et al. 2022), which may contribute to an increased emotional distance between fathers and adolescents. As such, brokering stress for fathers, or less positive relationships with fathers related to brokering, may intensify the negative impact of academic discrimination, potentially lowering high school grades, reducing high school engagement, and ultimately lowering educational expectations in young adulthood. As a corollary, having stronger positive relationships with fathers tied to language brokering may mitigate the negative effects of academic discrimination in middle school on future academic outcomes, as fathers (relative to mothers) are more influential in fostering high educational expectations in young adulthood (Aceves et al. 2020). Due to adolescents' more frequent language brokering for mothers than fathers (Shen and Dennis 2019), adolescents hold closer relationships with mothers and may resolve stress more easily (Crockett et al. 2007; Kim et al. 2022). As such, closer relationships with mothers (vs. fathers) tied to language brokering may also reduce (but perhaps not as strongly as fathers, as mothers are less influential in the academic domain), the negative impact of academic discrimination in middle school on adolescents' long-term academic outcomes.

Understanding how stressful language brokering experiences exacerbate (for mothers vs. fathers) or how positive language brokering experiences (for mothers vs. fathers) buffer against the negative effects of academic discrimination on academic outcomes can provide valuable insights for developing interventions aimed at supporting adolescents in their familial role as language brokers. Such interventions aimed at language brokers that are specific to their experiences of language brokering (for mothers vs. fathers) may diminish the long-term consequences of academic discrimination experiences in middle school on their future educational expectations in young adulthood.

### 1.4 | Sensitivity Analysis

The proposed model for the current study tests whether academic discriminatory experiences in middle school may lower Mexican-origin adolescents' high school grades and high school engagement, and in turn future educational expectations as young adults. The proposed sensitivity analysis tests the robustness of the temporal ordering of the original model's constructs by also starting with academic discrimination in middle school, but reverses the order of subsequent constructs, by linking to high school educational expectations, and ultimately to school grades and school engagement in young adulthood. Indeed, academic discrimination from both teachers and peers during middle school may diminish Mexican-origin adolescents' sense of academic competence to negatively influence their attitudes toward school (Brown 2015), which may contribute to reduced educational expectations in high school (Kiang et al. 2015). In turn, adolescents are likely to experience lower academic performance (Castro et al. 2024) and decreased school engagement as young adults (Verkuyten et al. 2019).

Similar to the original model, the proposed sensitivity analysis model also tests whether language brokering experiences condition the longitudinal pathway from academic discrimination in middle school to adolescents' educational expectations in high school, then to young adult's school grades/engagement. In addition, the proposed sensitivity analysis also tests whether positive relationships with mothers and fathers tied to language brokering may mitigate or whether negative experiences such as stress of language brokering may exacerbate the long-lasting negative effects of academic discrimination in middle school to young adult's school grades/engagement. The results of sensitivity analysis will provide evidence on whether the proposed or the alternative model is a better fit to the data.

### 1.5 | Current Study

Using four waves of longitudinal data, the study first examines the indirect effect of academic discrimination in middle school on educational expectations in young adulthood through high school grades and engagement (see Figure 1, from b1 → b2 and b3 → b4). Second, in the mediation model, the study further tests the moderating role of language brokering (positive relationships with mothers and fathers, brokering stress for mothers and fathers) on the pathway from academic discrimination in middle school to school grades/engagement in high school to educational expectations in young adulthood (see Figure 1, c1 conditions b1 → b2 and c2 conditions b3 → b4). Third, sensitivity analysis tests the indirect effect of academic discrimination in middle school on young adulthood school grades/engagement through high school educational expectations (see Figure 2's alternative model, from e1 → e2 and e3). Fourth, sensitivity analysis examines the moderating role of language brokering experiences on the pathway from academic discrimination in middle school to high school educational expectations to young adulthood' school grades/engagement (see Figure 2's alternative model, f1 conditions e1 → e2 and e3).

Based on the past literature, it is first hypothesized that Mexican-origin adolescents who have higher levels of academic discrimination in middle school would display lower high school grades and lower school engagement, which ultimately lowers the highest level of education they expect to achieve in young adulthood. Second, positive relationships with mothers/fathers tied to language brokering are expected to mitigate the negative indirect association from academic discrimination to educational expectations, whereas stress of language brokering for mothers/fathers is expected to exacerbate the negative indirect association from academic discrimination to educational expectations. This moderation effect is

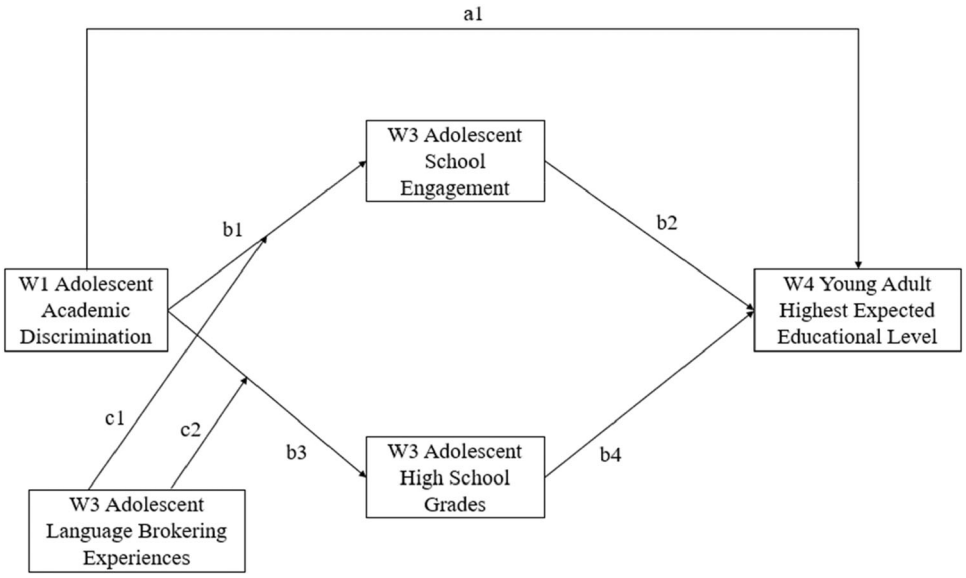


**FIGURE 1** | Conceptual model: Pathway from adolescent academic discrimination to young adult highest expected educational level as moderated by adolescent language brokering experiences. *Note:* W1 = Wave 1, W2 = Wave 2, W3 = Wave 3. Adolescent language brokering experiences include the following: positive relationships with parents tied to language brokering and language brokering stress for parents. All moderators were analyzed in separate models. Adolescent experiences for mothers and fathers were analyzed in separate models. W1 adolescent age, binary gender, nativity, highest expected educational level, and maternal educational level were controlled as covariates. A total of four models were estimated (two types of language brokering experiences for mothers and fathers).

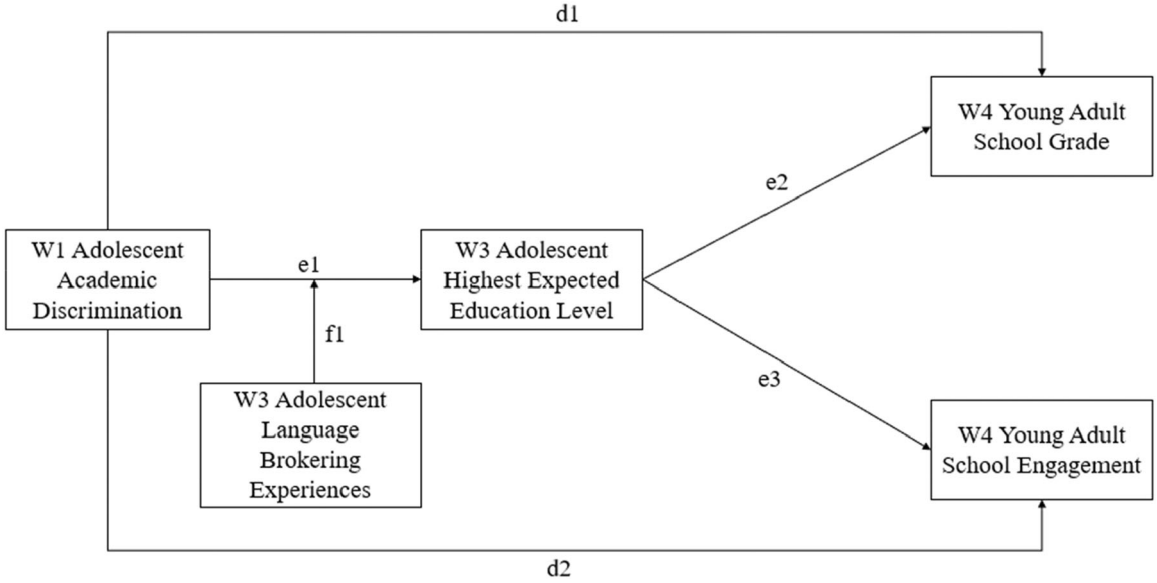


**FIGURE 2** | Alternative model: Pathway from adolescents' academic discrimination to young adult's school grades and school engagement as moderated by adolescent language brokering experiences. *Note:* W1 = Wave 1, W2 = Wave 2, W3 = Wave 3. Adolescent language brokering experiences include the following: positive relationships with parents tied to language brokering and language brokering stress for parents. All moderators were analyzed in separate models. Adolescent experiences for mothers and fathers were analyzed in separate models. W1 adolescent age, binary gender, nativity, highest expected educational level, and maternal educational level were controlled as covariates. A total of four models were estimated (two types of language brokering experiences for mothers and fathers).

expected to be stronger for adolescents' language brokering experiences for fathers. Sensitivity analysis is also used to test an alternative mediation model from academic discrimination in middle school to school grades/engagement in young adulthood via high school educational expectations. Similar to the original model, sensitivity analysis also involves tests of language brokering experiences as potential moderators of the conditional indirect effect. Results of sensitivity analyses will determine whether the original or the alternative model is the more tenable model for the proposed hypothesis.

## 2 | Methods

### 2.1 | Participants

Data for the current study are from a four-wave longitudinal study (Wave 1: 2012–2015, Wave 2: 2013–2016, Wave 3: 2017–2020, and Wave 4: 2021–2023). Participants were 604 Mexican-origin adolescents who were initially recruited from middle schools in central Texas. At Wave 1, approximately half of the participants were female ($N_{female} = 328$, 54%), and about three-quarters ($N_{U.S.-born} = 453$, 75%) were born in the United States. Most of the parents were of Mexican-origin ($N_{mother} = 592$, 99.30%; $N_{father} = 289$, 98.6%) and had lived in the United States for more than a decade, with mothers having lived on average 15.07 years (SD = 5.59), and fathers 18.84 years (SD = 7.96). Of the 604 participants at Wave 1 ($M_{age} = 12.38$, SD = 0.92), 483 continued participating at Wave 2 ($M_{age} = 13.20$, SD = 0.93), 334 at Wave 3 ($M_{age} = 17.05$, SD = 1.12), and 236 in Wave 4 ($M_{age} = 20.61$, SD = 1.33).

Participants were early adolescents attending middle school at Wave 1, late adolescents attending high school at Wave 3, and 46% were attending school as young adults at Wave 4. Attrition analysis demonstrated that adolescents who did and did not participate from Wave 1 to W4 were significantly different in age ($t$ (602) = 0.60, $p = 0.04$) and gender ($X^2$ (1, $N = 604$) = 7.95, $p = 0.01$). Adolescents who were younger in age and female were more likely to participate at Wave 4. As such, Wave 1 adolescent age and gender were controlled as covariates. Wave 2 data were excluded from the study as some adolescents were still attending middle school and the goal of the study was to link academic discrimination in middle school at Wave 1 to school grades/engagement in high school at Wave 3 in the pathway model. Sample size is 236 for the proposed analytic models (i.e., those who remained in the study at Wave 4).

### 2.2 | Procedures

Families were contacted through public records, school presentations, and community organizations. Families were eligible to participate if both parents were of Mexican origin and the child translated from English to Spanish for at least one of their parents during middle school. If the family chose to participate, consent was obtained from the parents, and assent from the child during an acquaintance visit. A survey was prepared in English and Spanish and read out loud in the participant's preferred language. Participants' responses were recorded in person on a laptop computer for Waves 1, 2, and 3. During Wave 4, surveys were similarly administered using the virtual meeting platform, Zoom. Families were compensated $60 at Wave 1, $90 at Waves 2 and 3, and $70 at Wave 4.

### 2.3 | Measures

English questionnaires were first translated into Spanish and then back-translated into English. Bilingual research assistants

translated the questions, and any discrepancies were resolved through discussion.

#### 2.3.1 | Adolescent Academic Discrimination Experiences

At Wave 1, academic discrimination was assessed using four items (e.g., "Teachers and students assume I'm less intelligent.") (McNeilly et al. 1996). Adolescents self-reported using a scale ranging from 1 (*Strongly disagree*) to 5 (*Strongly agree*), with higher scores indicating more experiences of academic discrimination ($\alpha = 0.57$).

#### 2.3.2 | Adolescent School Grades

At Waves 3 and Wave 4, adolescents self-reported their school grades on a 13-item scale (1 = A+, 2 = A, 3 = A−, 4 = B+, 5 = B, 6 = B−, 7 = C+, 8 = C, 9 = C−, 10 = D+, 11 = D, 12 = D−, 13 = F). The scores were reverse-coded, such that higher scores reflect better academic performance.

#### 2.3.3 | School Engagement

At Waves 3 and 4, school engagement was assessed using four items (e.g., "I am motivated to get good grades in school") (Hou et al. 2018). Adolescents self-reported using a scale ranging from 1 (*Strongly disagree*) to 5 (*Strongly agree*) ($\alpha_{wave3} = 0.69$ and $\alpha_{wave4} = 0.73$).

#### 2.3.4 | Educational Expectations

At Waves 3 and 4, adolescents' highest level of education expected was assessed by asking, "What is the highest level of education you expect to achieve in school?" Adolescents answered this question on an eight-point scale ranging from 1 (*Some middle school*) to 8 (*Finished a graduate degree: Master's degree, medical, etc.*).

#### 2.3.5 | Positive Relationships with Parents

At Wave 3, adolescents reflected on five statements associated with having positive relationships with parents (separately for mothers and fathers) tied to language brokering (e.g., "I understand my father/mother) better because I translate for him/her") (Kim et al. 2017). Adolescents reported their experiences using a scale ranging from 1 (*Strongly disagree*) to 5 (*Strongly agree*), with higher scores reflecting more positive relationships ($\alpha_{father} = 0.84$, $\alpha_{mother} = 0.80$).

#### 2.3.6 | Stress of Translating at Different Places for Parents

At Wave 3, adolescents reported on language brokering stress for parents (separately for mothers and fathers) at seven different places (e.g., at the doctor's office) by answering, "How stressful is it to translate from English to Spanish for your father/mother at the following places?" (Zhang et al. 2020). Adolescents answered the questions on a scale ranging from 1 (*Not stressful*) to 5 (*Extremely stressful*), with higher scores reflecting more language brokering stress ($\alpha_{father} = 0.90$, $\alpha_{mother} = 0.89$).

### 2.4 | Covariates

Covariates included adolescent age, gender (0 = *Male*, 1 = *Female*), nativity (0 = *Mexican-born*, 1 = *U.S.-born*), and mother's highest level of education using a scale ranging from 1 (*No formal schooling)* to 11 (*Finished graduate degree)*. These covariates were selected as studies have shown that U.S.-born Latinos have higher educational attainment than foreign-born Latinos (Moslimani and Noe-Bustamante 2023). Moreover, Latinas show higher educational attainment than Latinos (Choi and Tienda 2021), and maternal education level is associated with their children's academic performance (Altschul 2012).

### 2.5 | Analysis Plan

Models were estimated in Mplus 8.3 (Muthen and Muthen 2017). Maximum likelihood estimation with robust standard errors (MLR) was used to account for potential non-normality of data. Full information maximum likelihood (FIML) was used to handle missing data. First, a single model was estimated for the pathway from Wave 1 academic discrimination to Wave 4 adolescents' highest expected education level through Wave 3 adolescent school engagement (b1 → b2, Figure 1) and Wave 3 adolescent high school grades (b3 → b4, Figure 1). Second, four models (two types of language brokering experiences X language brokering experiences for mothers and fathers) estimated the moderating effect of Wave 3 adolescent language brokering experiences (i.e., positive relationships with parents tied to language brokering and language brokering stress for parents) in the association between Wave 1 adolescent academic discrimination and Wave 3 adolescent school engagement (c1 influence on b1, Figure 1) and the association between Wave 1 adolescent academic discrimination and Wave 3 adolescent high school grades (c2 influence on b3, Figure 1). Third, simple slopes (1 SD above, below, and at the mean of the moderator) were plotted to probe for any significant interactions (Aiken and West 1991). Fourth, based on the four models in the second step, conditional indirect effects were estimated for the pathway from Wave 1 adolescent academic discrimination to Wave 4 adolescent highest expected education level through adolescent school engagement (c1 influence on b1 → b2) and school grades (c2 influence on b3 → b4) at different levels of language brokering experiences. Finally, Johnson–Neyman analysis was conducted to determine the significant region of moderators (Wave 3 adolescent language brokering experiences) in the pathway from Wave 1 adolescent academic discrimination to Wave 4 adolescent highest expected education level (Aiken and West 1991; Johnson and Fay 1950). All covariates, including Wave 1 adolescent age, nativity, gender, and Wave 1 maternal education level, were controlled on educational expectations at Wave 4.

To demonstrate the robustness of the proposed model, sensitivity analysis was conducted. Given that the sensitivity analysis focused on examining Wave 4 young adult's school engagement and grades, sensitivity analysis model was restricted to 108 participants still enrolled in school at Wave 4 ($M_{age} = 20.20$, $SD_{age} = 1.27$). Sensitivity analysis followed all the same steps as above for testing the pathways model and conditional indirect effects.

### 2.6 | Researcher Positionality

All authors of the manuscript represent minoritized individuals in the United States and experienced first-hand linguistic challenges and/or cultural dissonance in their adaptation to the United States, much like the Mexican-origin adolescents described in this study. All authors are of immigrant origin, and became attuned to discriminatory experiences of minoritized individuals in the school setting through their own experiences of schooling in the United States. For some research team members, who were themselves a language broker for their immigrant parents, they bring their own lived experiences as a language broker in interpreting the study findings presented in this study.

## 3 | Results

### 3.1 | Descriptive Statistics

Descriptive information and correlations among studied variables are presented in Table 1. Study results suggest that Wave 1 adolescent experience of academic discrimination in early adolescence was negatively associated with Wave 3 adolescent high school grades, Wave 3 adolescent school engagement, and Waves 3 and 4's highest expected educational level in late adolescence/young adulthood. Moreover, Wave 3 adolescent high school grades and Wave 3 adolescent school engagement were positively associated with Waves 3 and 4's highest expected education level in late adolescence/young adulthood.

### 3.2 | Pathway From Academic Discrimination to Highest Expected Education Level

Figure 3 presents the pathway from Wave 1 academic discrimination to Wave 4 adolescent highest expected education level through Wave 3 adolescent school engagement and Wave 3 adolescent high school grades. The results show that Wave 1 adolescent experiences of academic discrimination in early adolescence were negatively associated with Wave 3 adolescent high school grades ($b = -0.18$, $SE = 0.08$, and $p = 0.02$) and school engagement ($b = -0.17$, $SE = 0.08$, and $p = 0.04$) in late adolescence. Wave 3 high school grades were positively associated with Wave 4 young adults' highest expected educational level ($b = 0.24$, $SE = 0.10$, and $p = 0.02$). However, Wave 3 adolescent school engagement was not significantly related to Wave 4 young adults' highest expected educational level.

### 3.3 | Moderating Role of Adolescent Language Brokering Experiences

Tables 2 and 3 present the significant moderating effect of Wave 3 adolescent language brokering experiences (i.e., positive relationship with parents tied to language brokering and language brokering stress for parents) on the association between Wave 1 academic discrimination and Wave 3 adolescent high school grades. Simple slopes (Figure 4) of the moderating effect of Wave 3 adolescent positive relationship with fathers tied to language brokering experiences show that when adolescents had low ($b = -1.16$, $SE = 0.35$, and $p < 0.01$) and mean ($b = -0.59$, $SE = 0.25$, and $p = 0.02$) levels of positive relationship with fathers tied to language brokering experiences, experiencing academic discrimination in early adolescence (Wave 1) related to lower high school grades in late adolescence (Wave 3). However, when adolescents had high ($b = 0.01$, $SE = 0.34$, and $p = 0.98$) levels of positive relationship with fathers tied to language brokering experiences, adolescents' experiences of academic discrimination in early adolescence had no influence on their high school grades in late adolescence. A similar pattern was found in the moderating role of a positive relationship with mothers tied to language brokering experience (Figure 5). Specifically, adolescents were vulnerable to the detrimental impact of academic discrimination on high school grades when they had low ($b = -0.98$, $SE = 0.35$, and $p = 0.01$) and medium ($b = -0.51$, $SE = 0.23$, and $p = 0.03$) levels of positive relationship with mothers tied to language brokering experience. However, academic discrimination had no influence on adolescent high school grades when adolescents had high ($b = 0.03$, $SE = 0.26$, and $p = 0.91$) levels of positive relationship with mothers tied to language brokering experience. The results illustrate that positive relationships with fathers or mothers tied to language brokering experience could be a potential protective factor for Mexican-origin adolescents to buffer against the detrimental effect of academic discrimination on high school grades.

Furthermore, simple slopes (Figure 6) of the moderating effect Wave 3 adolescent language brokering stress for fathers show that when adolescents experienced high ($b = -0.80$, $SE = 0.20$, and $p < 0.001$) levels of language brokering stress for fathers, they were vulnerable to the detrimental influence of academic discrimination in early adolescence (Wave 1) on high school grades in late adolescence (Wave 3). However, when adolescents had low ($b = -0.16$, $SE = 0.36$, and $p = 0.66$) and mean ($b = -0.48$, $SE = 0.25$, and $p = 0.06$) levels of language brokering stress for fathers, adolescents' experiences of academic discrimination in early adolescence had no influence on their high school grades in late adolescence. A similar pattern was found for the moderating role of language brokering stress for mothers (Figure 7). Specifically, adolescents were vulnerable to the detrimental impact of academic discrimination on high school grades when they experienced mean ($b = -0.49$, $SE = 0.24$, and $p = 0.04$) and high ($b = -1.19$, $SE = 0.32$, and $p < 0.001$) levels of language brokering stress for mothers. However, academic discrimination had no impact on adolescent high school grades when they had low ($b = 0.20$, $SE = 0.35$, and $p = 0.57$) levels of language brokering stress for mothers. The results show that high levels of language brokering stress for fathers or mothers could be a risk factor that exacerbates the negative effects of academic discrimination on adolescents' high school grades.

**TABLE 1** | Descriptive information and correlation of study variables ($N = 236$).

| Variable | *M* | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. W1 academic discrimination | 2.05 | 0.62 | — | | | | | | | | |
| 2. W3 A high school grades | 9.69 | 1.85 | −0.21** | — | | | | | | | |
| 3. W3 A school engagement | 3.69 | 0.54 | −0.15* | 0.38*** | — | | | | | | |
| 4. W3 A highest expected educational level | 6.65 | 1.24 | −0.18* | 0.27*** | 0.26*** | — | | | | | |
| 5. W3 A positive relationship with M tied to language brokering | 3.58 | 0.66 | −0.11 | 0.15 | 0.20** | 0.18* | — | | | | |
| 6. W3 A positive relationship with F tied to language brokering | 3.35 | 0.72 | −0.17* | 0.14 | 0.16* | 0.07 | 0.57*** | — | | | |
| 7. W3 A language brokering stress for M | 1.87 | 0.73 | −0.07 | −0.03 | −0.06 | −0.02 | −0.06 | −0.23** | — | | |
| 8. W3 A language brokering stress for F | 1.64 | 0.69 | −0.01 | 0.04 | −0.10 | 0.09 | −0.14 | −0.19* | 0.57*** | — | |
| 9. W4 YA school grades | 9.85 | 1.71 | −0.08 | 0.39*** | 0.21 | 0.21 | −0.04 | 0.03 | 0.11 | −0.05 | — |
| 10. W4 YA school engagement | 3.78 | 0.51 | −0.06 | 0.10 | 0.27* | 0.18 | −0.11 | 0.14 | −0.07 | 0.01 | 0.49*** |
| 11. W4 YA highest expected educational level | 6.29 | 1.43 | −0.17** | 0.29*** | 0.25*** | 0.56*** | 0.22** | 0.16 | −0.02 | 0.08 | 0.17 |
| 12. W1 A high school grade | 10.17 | 1.78 | −0.21** | 0.28*** | 0.28*** | 0.38*** | 0.13 | 0.04 | −0.01 | 0.06 | 0.17 |
| 13. W1 A school engagement | 3.91 | 0.66 | −0.22*** | 0.06 | 0.23** | 0.28*** | 0.05 | 0.08 | −0.12 | −0.04 | 0.27** |
| 14. W1 A highest expected educational level | 7.24 | 1.14 | 0.01 | 0.07 | 0.08 | 0.20** | 0.03 | 0.04 | 0.07 | −0.02 | 0.17 |
| 15. W1 A age | 12.38 | 0.92 | 0.13* | −0.07 | −0.07 | −0.21** | −0.04 | −0.04 | 0.09 | 0.05 | 0.02 |
| 16. W1 A gender | 0.61 | | −0.16* | 0.28*** | −0.03 | 0.06 | 0.01 | −0.05 | 0.24*** | 0.19* | 0.26** |
| 17. W1 A nativity | 0.26 | | 0.02 | 0.01 | 0.12 | −0.01 | 0.11 | 0.07 | 0.16* | −0.01 | 0.17 |
| 18. W1 maternal educational level | 5.02 | 2.3 | −0.04 | 0.14 | 0.13 | 0.23** | 0.16* | 0.08 | −0.06 | −0.02 | 0.15 |

| Variable | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|
| 10. W4 YA school engagement | — | | | | | | | |
| 11. W4 YA highest expected educational level | 0.12 | — | | | | | | |
| 12. W1 A high school grade | 0.09 | 0.34*** | — | | | | | |
| 13. W1 A school engagement | 0.24* | 0.22*** | 0.44*** | — | | | | |
| 14. W1 A highest expected educational level | 0.04 | 0.17** | 0.14* | 0.31* | — | | | |
| 15. W1 A age | −0.00 | −0.14* | −0.08 | −0.12 | 0.02 | — | | |
| 16. W1 A gender | 0.09 | −0.00 | 0.17** | 0.04 | 0.01 | −0.08 | — | |
| 17. W1 A nativity | 0.02 | 0.07 | 0.11 | 0.05 | 0.09 | 0.13* | −0.05 | — |
| 18. W1 maternal educational level | 0.01 | 0.15* | 0.06 | −0.02 | 0.02 | −0.04 | −0.01 | 0.13* |

*Note:* Adolescent gender and nativity are dummy-coded. For gender, 0 represents male and 1 represents female. For nativity, 0 represents born in the United States and 1 represents born in Mexico.
Abbreviations: A, adolescent; F, father; M, mother; W1, Wave 1; W2, Wave 2; W3; Wave 3; YA, young adult.
*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

### 3.4 | Conditional Effect of Adolescent Language Brokering Experiences in the Pathway From Academic Discrimination and Adolescent Highest Expected Education Level

Table 4 presents the significant conditional indirect effect of adolescent brokering experiences (i.e., a positive relationship with fathers tied to language brokering or language brokering stress for fathers) in the pathway from Wave 1 academic discrimination to Wave 4 young adults' highest expected educational level. The Johnson–Neyman plot (Figure 8) of the conditional indirect effect at different levels of Wave 3 adolescent positive relationship with fathers tied to language brokering suggests that the pathway from Wave 1 academic discrimination to Wave 4 adolescent highest expected education level was only significant (estimate of the cutoff point: $b = -0.26$, SE = 0.13, and $p = 0.04$) when adolescents had low levels (0.25 points lower than the centered mean of W3 adolescent positive relationship with fathers tied to language

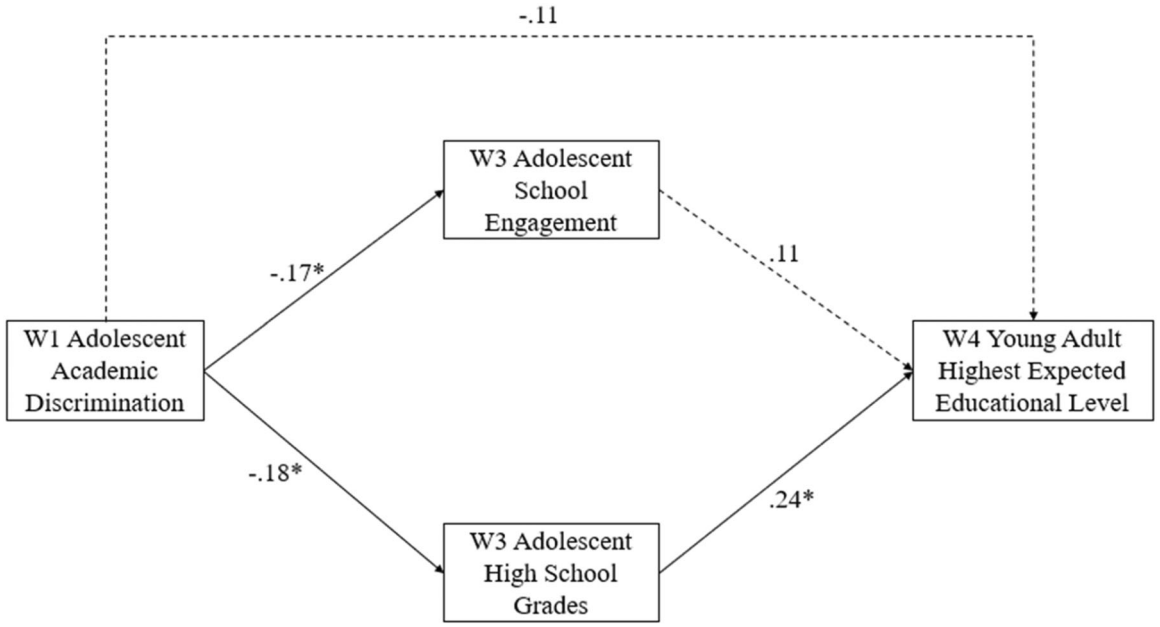


**FIGURE 3** | Standardized regression coefficients for the pathway from adolescent academic discrimination to young adult highest expected educational level. *Note:* W1 = Wave 1, W2 = Wave 2, W3 = Wave 3. Solid lines represent significant coefficients and dotted lines represent non-significant coefficients. Covariates include age, gender, mother's educational level, and adolescent's Wave 1 highest expected educational level. $^{*}p < 0.05$, $^{**}p < 0.01$, and $^{***}p < 0.001$.

brokering; 31.5% of the participants) of positive relationship with fathers tied to language brokering. Results demonstrate that low levels of positive relationship with fathers tied to language brokering can be a risk factor for Mexican-origin adolescents that exacerbates the effect of early-adolescence academic discrimination on young adult highest expected educational level through high school grades.

The Johnson–Neyman plot (Figure 9) of the conditional effect regarding different levels of Wave 3 adolescent language brokering stress for fathers suggests that the pathway from Wave 1 academic discrimination to Wave 4 adolescent highest expected education level was only significant when adolescents had high levels (0.40 points above than the centered mean of Wave 3 adolescent language brokering stress for fathers; 22.0% of the participants) of language brokering stress for fathers ($b = -0.19$, SE = 0.09, and $p = 0.03$). Results illustrate that high levels of language brokering stress for fathers could be a risk factor for Mexican-origin adolescents that exacerbates the effect of academic discrimination on young adult highest expected educational level.

The conditional indirect effect of a positive relationship with mothers tied to language brokering and language brokering stress for mothers on the pathway from Wave 1 academic discrimination to Wave 4 young adults' highest expected educational level were also tested. However, neither modified the pathway from Wave 1 academic discrimination to Wave 4 young adults' highest expected educational level.

### 3.5 | Sensitivity Analysis Model

Results for the sensitivity analysis show that Wave 1 academic discrimination was associated with lower Wave 3 adolescents' highest expected educational level ($b = -0.37$, SE = 0.15, and $p = 0.02$), but not associated with Wave 4 school engagement ($b = -0.01$, SE = 0.10, and $p = 0.92$) nor Wave 4 young adults' school grades ($b = -0.01$, SE = 0.10, and $p = 0.92$). Wave 3 adolescent highest expected educational level was also not significantly associated with Wave 4 young adult school engagement ($b = 0.07$, SE = 0.07, and $p = 0.33$) nor Wave 4 young adult school grades ($b = 0.14$, SE = 0.27, and $p = 0.61$). Moreover, Wave 3 adolescent positive relationship with parents tied to language brokering (fathers: $b = 0.38$, SE = 0.23, and $p = 0.11$; mothers: $b = 0.30$, SE = 0.22, and $p = 0.18$) nor language brokering stress for parents (fathers: $b = -0.28$, SE = 0.29, and $p = 0.34$; mothers: $b = -0.24$, SE = 0.19, and $p = 0.20$) moderated the association between Wave 1 academic discrimination and Wave 3 adolescent highest expected educational level. The mostly nonsignificant results in the sensitivity analysis model illustrate the robustness of the proposed study model.

## 4 | Discussion

Given that many ethnic minority immigrant families continue to see education as a vehicle for upward familial economic mobility, academic discrimination poses a critical obstacle for Mexican-origin youth as they continue to experience discrimination within the educational setting in the United States (Gonzalez et al. 2014). This study examined whether Mexican-origin adolescents' experiences with a specific (and relatively understudied) type of discrimination—academic discrimination—could affect their education expectations through lowered school engagement and/or their obtained school grades. This study also extended the existing literature by testing whether language brokering, or the act of translating for their English-limited parents, would moderate the indirect effects from youths' academic discrimination on their

**TABLE 2** | Unstandardized regression coefficients for the main effect and interaction model for young adult's highest expected educational level with academic discrimination and adolescent positive relationship with parents tied to language brokering.

| | Mother | | Father | |
|---|---|---|---|---|
| | **Model 1: Main effect model *b* (SE)** | **Model 2: Interaction model *b* (SE)** | **Model 1: Main effect model *b* (SE)** | **Model 2: Interaction model *b* (SE)** |
| W3 adolescent high school grades (mediation model) | | | | |
| W1 academic discrimination | −0.49* (0.24) | −0.51* (0.23) | −0.46 (0.25) | −0.59* (0.25) |
| W3 adolescent positive relationship with mother/father tied to language brokering | 0.37 (0.22) | 0.35 (0.20) | 0.34 (0.25) | 0.17 (0.21) |
| W1 academic discrimination X W3 adolescent positive relationship with mother/father tied to language brokering | – | 0.72* (0.31) | – | 0.80* (0.33) |
| W1 adolescent binary gender | 0.86** (0.28) | 0.94** (0.29) | 0.90** (0.29) | 1.21*** (0.30) |
| W3 adolescent school engagement (mediation model) | | | | |
| W1 academic discrimination | −0.13 (0.07) | −0.13 (0.07) | −0.13 (0.07) | −0.16* (0.08) |
| W3 adolescent positive relationship with mother/father tied to language brokering | 0.15* (0.06) | 0.15* (0.06) | 0.10 (0.06) | 0.10 (0.07) |
| W1 academic discrimination X W3 adolescent positive relationship with mother/father tied to language brokering | – | 0.00 (0.09) | – | −0.01 (0.08) |
| W1 adolescent binary gender | −0.07 (0.08) | −0.07 (0.08) | −0.06 (0.08) | −0.04 (0.08) |
| W4 young adult highest expected educational level (dependent variable model) | | | | |
| W1 academic discrimination | −0.26 (0.15) | −0.28 (0.17) | −0.26 (0.15) | −0.21 (0.16) |
| W3 adolescent high school grades | 0.18* (0.08) | 0.18* (0.07) | 0.18* (0.07) | 0.23** (0.08) |
| W3 adolescent school engagement | 0.30 (0.20) | 0.30 (0.20) | 0.30 (0.20) | 0.34 (0.21) |
| W1 adolescent age | −0.18 (0.10) | −0.23* (0.11) | −0.18 (0.10) | −0.22 (0.12) |
| W1 adolescent binary gender | −0.21 (0.18) | −0.15 (0.20) | −0.21 (0.18) | −0.27 (0.21) |
| W1 adolescent nativity | 0.08 (0.19) | 0.04 (0.20) | 0.08 (0.19) | 0.11 (0.21) |
| W1 maternal educational level | 0.07 (0.04) | 0.09* (0.04) | 0.07 (0.04) | 0.06 (0.04) |
| W1 adolescent highest expected educational level | 0.19** (0.07) | 0.14 (0.07) | 0.19** (0.07) | 0.20* (0.08) |
| RMSEA | 0.04 | 0.00 | 0.03 | 0.01 |
| CFI | 0.96 | 1.00 | 0.98 | 1.00 |
| SRMR | 0.04 | 0.04 | 0.04 | 0.05 |

*Note:* Adolescent gender and nativity are dummy-coded. For gender, 0 represents male and 1 represents female. For nativity, 0 represents born in the United States and 1 represents born in Mexico. Wave 1 adolescent binary gender was controlled on Wave 3 adolescent high school grades and school engagement to improve model fit, and because Mexican-origin girls tend to have higher high school GPA and school engagement than boys.
Abbreviations: SE, standard error; W1, Wave 1; W2, Wave 2; W3, Wave 3.
*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

**TABLE 3** | Unstandardized regression coefficients for the main effect and interaction model for young adult highest expected educational level with academic discrimination and language brokering stress.

| | Mother | | Father | |
|---|---|---|---|---|
| | **Model 1: Main effect model *b* (SE)** | **Model 2: Interaction model *b* (SE)** | **Model 1: Main effect model *b* (SE)** | **Model 2: Interaction model *b* (SE)** |
| W3 adolescent high school grades (mediation model) | | | | |
| W1 academic discrimination | −0.54* (0.25) | −0.49* (0.24) | −0.54* (0.25) | −0.48 (0.25) |
| W3 adolescent language brokering stress | −0.25 (0.21) | −0.23 (0.19) | −0.08 (0.23) | −0.03 (0.17) |
| W1 academic discrimination X W3 adolescent language brokering stress | – | −0.95** (0.33) | – | −0.46* (0.21) |
| W1 adolescent binary gender | 0.94** (0.29) | 0.99*** (0.28) | 0.87** (0.28) | 1.14*** (0.28) |
| W3 adolescent school engagement (mediation model) | | | | |
| W1 academic discrimination | −0.15* (0.07) | −0.15* (0.07) | −0.15* (0.07) | −0.16* (0.08) |
| W3 adolescent language brokering stress | −0.04 (0.05) | −0.04 (0.05) | −0.10 (0.08) | −0.07 (0.06) |
| W1 academic discrimination X W3 adolescent language brokering stress | – | −0.14 (0.08) | – | −0.08 (0.08) |
| W1 adolescent binary gender | −0.06 (0.08) | −0.06 (0.08) | −0.05 (0.08) | −0.03 (0.08) |
| W4 young adult highest expected educational level (dependent variable model) | | | | |
| W1 academic discrimination | −0.26 (0.15) | −0.28 (0.17) | −0.26 (0.15) | −0.18 (0.17) |
| W3 adolescent high school grades | 0.17* (0.08) | 0.16* (0.08) | 0.18* (0.08) | 0.24** (0.08) |
| W3 adolescent school engagement | 0.31 (0.20) | 0.32 (0.20) | 0.30 (0.20) | 0.21 (0.26) |
| W1 adolescent age | −0.18 (0.10) | −0.23* (0.11) | −0.18 (0.10) | −0.24 (0.13) |
| W1 adolescent binary gender | −0.20 (0.18) | −0.14 (0.20) | −0.21 (0.18) | −0.28 (0.22) |
| W1 adolescent nativity | −0.09 (0.19) | 0.04 (0.21) | 0.08 (0.19) | 0.10 (0.21) |
| W1 maternal educational level | 0.07 (0.04) | 0.09* (0.04) | 0.07 (0.04) | 0.04 (0.05) |
| W1 adolescent highest expected educational level | 0.19** (0.07) | 0.14 (0.08) | 0.19** (0.07) | 0.17 (0.09) |
| RMSEA | 0.03 | 0.00 | 0.04 | 0.04 |
| CFI | 0.97 | 1.00 | 0.96 | 0.94 |
| SRMR | 0.04 | 0.04 | 0.04 | 0.05 |

*Note:* Adolescent gender and nativity are dummy-coded. For gender, 0 represents male and 1 represents female. For nativity, 0 represents born in the United States and 1 represents born in Mexico. Wave 1 adolescent binary gender was controlled on Wave 3 adolescent high school grades and school engagement (1) to improve model fit, (2) because Mexican-origin girls tend to have higher high school GPA and school engagement than boys.
Abbreviations: SE, standard error; W1, Wave 1; W2, Wave 2; W3, Wave 3.
*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

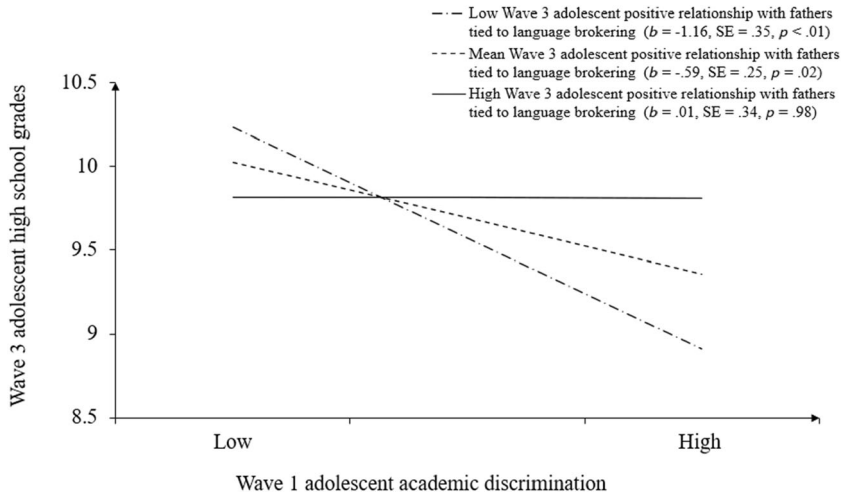


**FIGURE 4** | Moderating effect of W3 adolescent positive relationship with fathers tied to language brokering in the association between W1 adolescent academic discrimination and W3 adolescent high school grades. *Note:* W1 = Wave 1, W2 = Wave 2, W3 = Wave 3. The association between W1 adolescent academic discrimination and W3 adolescent high school grades was probed at low (1 SD below the mean), mean, and high (1 SD above the mean) levels of W3 adolescent positive relationship with fathers tied to language brokering.

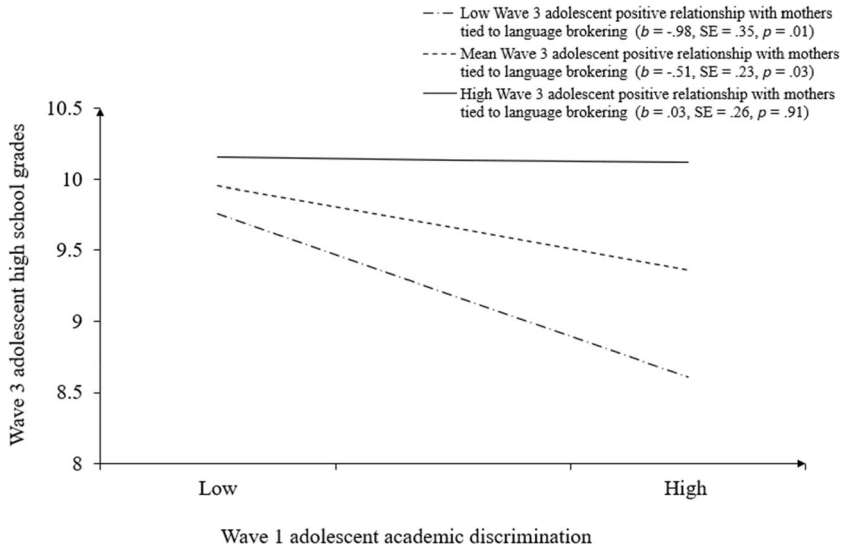


**FIGURE 5** | Moderating effect of W3 adolescent positive relationship with mothers tied to language brokering in the association between W1 adolescent academic discrimination and W3 adolescent high school grades. *Note:* W1 = Wave 1, W2 = Wave 2, W3 = Wave 3. The association between W1 adolescent academic discrimination and W3 adolescent high school grades was probed at low (1 SD below the mean), mean, and high (1 SD above the mean) levels of W3 adolescent positive relationship with mothers tied to language brokering.

educational expectations. The results of the current study are significant in explicating how middle school youths' experiences of academic discrimination can have far-reaching impacts on their educational expectations as they enter young adulthood.

In general, study findings show that Mexican-origin adolescents' experiences with academic discrimination in early adolescence can have a long-lasting detrimental influence on their academic performance, which persists into young adulthood in the form of lower educational expectations. Prior research has consistently demonstrated that discrimination can lower youths' self-worth and self-esteem and create doubts in adolescents about their abilities and potential (Berbery and O'Brien 2018). Specific to the academic setting, discriminatory experiences also adversely affect adolescents' relationships with their teachers and peers; they also obstruct access to support systems within the educational setting and contribute to more hostile perceptions of the school climate (Grossman and Liang 2008; Schafer 2023). Whereas many of the existing studies have focused broadly on the effects of discrimination (e.g., racial and ethnic discrimination, Benner et al. 2018), specific assessments of discrimination within the school setting are rarer, and the long-term consequence of *academic* discrimination is less well-known. This present work adopts a developmental perspective that highlights early adolescence as a potential critical developmental period, where frequent exposure to detrimental perceptions in schools (i.e., academic discrimination) may create negative experiences (e.g., adolescents coming to believe they are less capable or deserving of success) and reduce their long-term expectations for higher

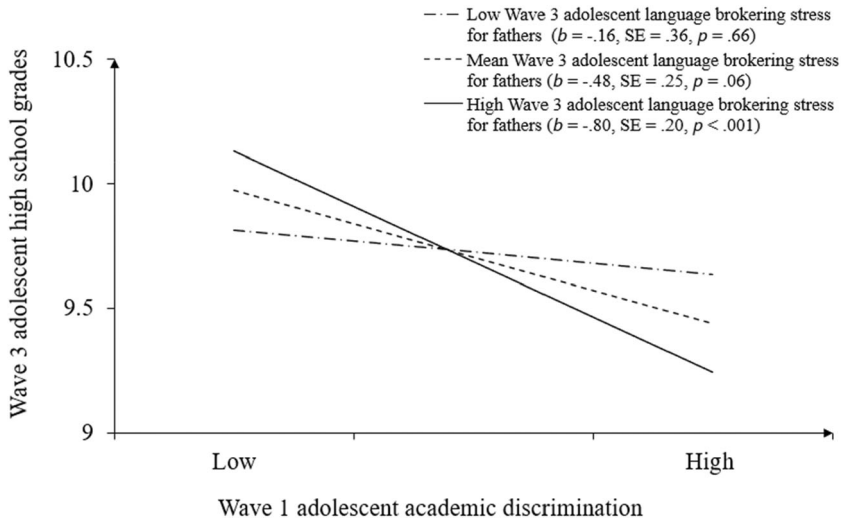


**FIGURE 6** | Moderating effect of W3 adolescent language brokering stress for fathers in the association between W1 adolescent academic discrimination and W3 adolescent high school grades. *Note:* W1 = Wave 1, W2 = Wave 2, W3 = Wave 3. The association between W1 adolescent academic discrimination and W3 adolescent high school grades was probed at low (1 SD below the mean), mean, and high (1 SD above the mean) levels of W3 adolescent language brokering stress for fathers.

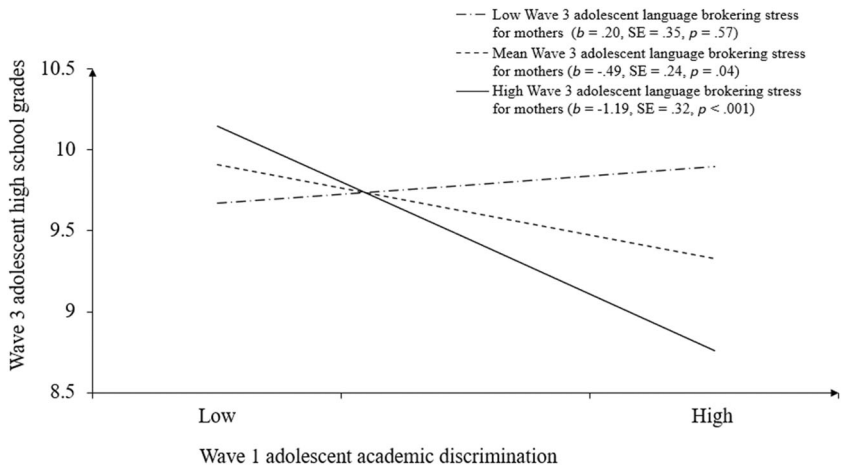


**FIGURE 7** | Moderating effect of W3 adolescent language brokering stress for mothers in the association between W1 adolescent academic discrimination and W3 adolescent high school grades. *Note:* W1 = Wave 1, W2 = Wave 2, W3 = Wave 3. The association between W1 adolescent academic discrimination and W3 adolescent high school grades was probed at low (1 SD below the mean), mean, and high (1 SD above the mean) levels of W3 adolescent language brokering stress for mothers.

education (Wheeler et al. 2020). It is recommended that high schools should strive to develop inclusive teaching practices or provide training to teachers and school staff to build cultural competence to help staff recognize and address any underlying biases they may have of their students. Schools can further incorporate critical pedagogy approaches that encourage students to question and challenge discriminatory practices and structures within the educational system to situate adolescents in a more favorable position to navigate the complexities of academic discrimination and beyond. However, providing teachers with training and critical pedagogy approaches may be insufficient or less effective unless they are embedded within broader structural changes. It is important to be mindful that schools do not simply reflect individual biases; they operate within institutional logics that often center whiteness through curricular content, behavioral norms, discipline practices, and definitions of academic success that may implicitly marginalize students from minoritized backgrounds (Diamond and Gomez 2023). These subtle but persistent patterns can create barriers to equity and penalize students who do not come with the same set of knowledge values in educational settings. Such efforts are especially critical during early developmental periods, as the adolescents in this study appeared to be attuned to these subtle, institutionalized forms of exclusion early in their schooling, and these early perceptions may shape their long-term academic trajectories. Although this study cannot directly intervene at the institutional level, findings underscore the importance of designing structural reforms (e.g., inclusive curricular policies, school-wide equity audits, and rethinking school disciplinary practices) simultaneously alongside teacher-level interventions. Without these broader shifts, even well-intentioned efforts at interpersonal change risk being absorbed into and limited by the very systems that perpetuate inequity.

**TABLE 4** | Conditional indirect effect of adolescent language brokering experiences for fathers in the pathway from academic discrimination to young adult's highest expected educational level.

| | *b* | SE | *p* |
|---|---|---|---|
| Conditional indirect effects at different levels of W3 adolescent positive relationship with fathers tied to language brokering | | | |
| −1 SD W3 adolescent positive relationship with fathers tied to language brokering | **−0.26** | **0.13** | **0.04** |
| Mean W3 adolescent positive relationship with fathers tied to language brokering | −0.13 | 0.08 | 0.08 |
| +1 SD W3 adolescent positive relationship with fathers tied to language brokering | −0.00 | 0.08 | 0.98 |
| Conditional indirect effects at different levels of W3 adolescent language brokering stress for fathers | | | |
| −1 SD W3 adolescent language brokering stress for father | −0.04 | 0.09 | 0.67 |
| Mean W3 adolescent language brokering stress for father | −0.12 | 0.08 | 0.14 |
| +1 SD W3 adolescent language brokering stress for father | **−0.19** | **0.09** | **0.03** |

*Note:* Bold denotes significant conditional indirect effects.
Abbreviations: SD, standard deviation; SE, standard error; W1, Wave 1; W2, Wave 2; W3, Wave 3.

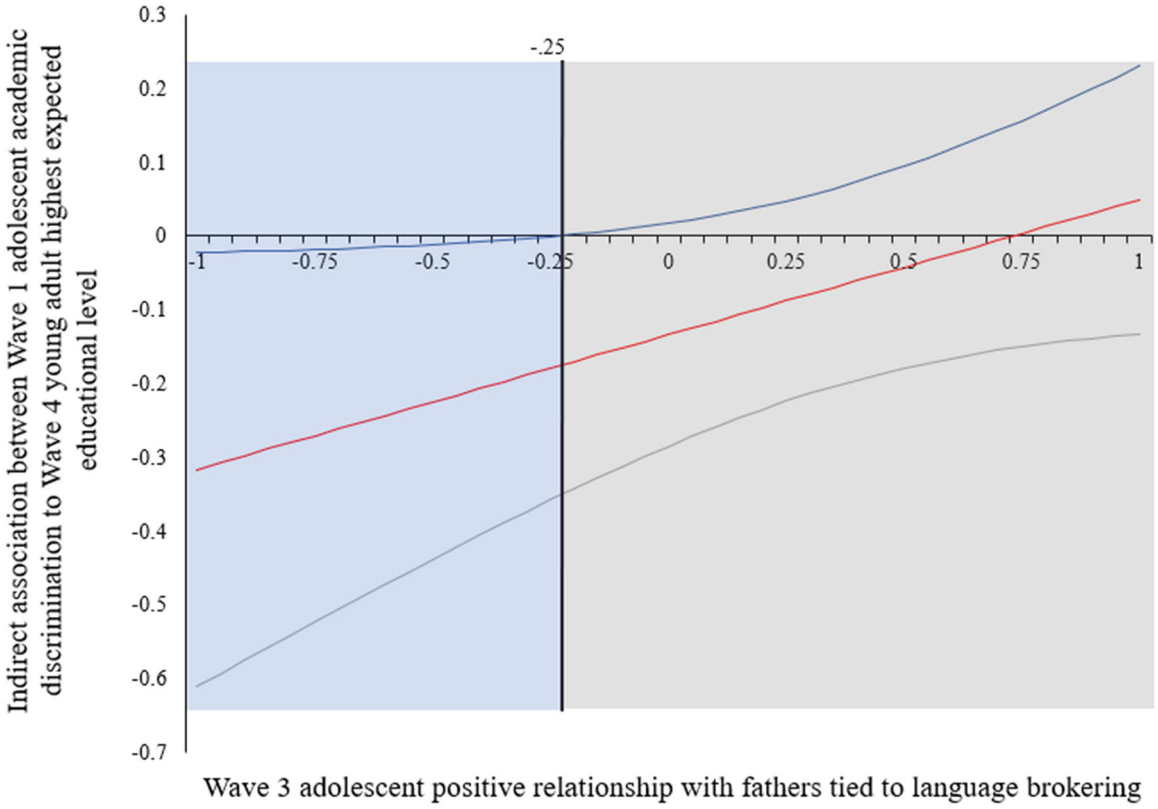


**FIGURE 8** | Johnson–Neyman region of significance of the pathway from W1 adolescent academic discrimination to W4 young adult highest expected educational level at different levels of W3 adolescent positive relationship with fathers tied to language brokering. *Note:* The gray and blue lines represent 95% confidence intervals. The vertical line represents the cutoff for the region of significance. The left side of the vertical line of W3 adolescent positive relationship with fathers tied to language brokering at −0.25 (0.25 points lower than the centered mean of W3 adolescent positive relationship with fathers tied to language brokering) is significant. In the gray region, the confidence bands include 0, indicating the pathway from W1 adolescent academic discrimination to W4 young adult's highest expected educational level is not significant. In the blue region, the confidence bands are below 0, indicating the pathway from W1 adolescent academic discrimination to W4 adolescent highest expected educational level was significantly negative. The range of W3 adolescent negative relationship with fathers tied to language brokering centered around the mean in the current sample is as follows: (−2.35, 1.65). The intersection of values of W3 adolescent positive relationship with fathers tied to language brokering equal to three simple slopes at −0.72 (i.e., −1 SD), 0 (i.e., mean), and 0.72 (i.e., +1 SD) for the association from W1 adolescent academic discrimination to W3 adolescent high school grades are presented in Figure 4. Overall, the plot suggests that the pathway from W1 adolescent academic discrimination to W4 young adult highest expected educational level is only significant when adolescents experience lower level of Wave 3 positive relationship with fathers tied to language brokering.

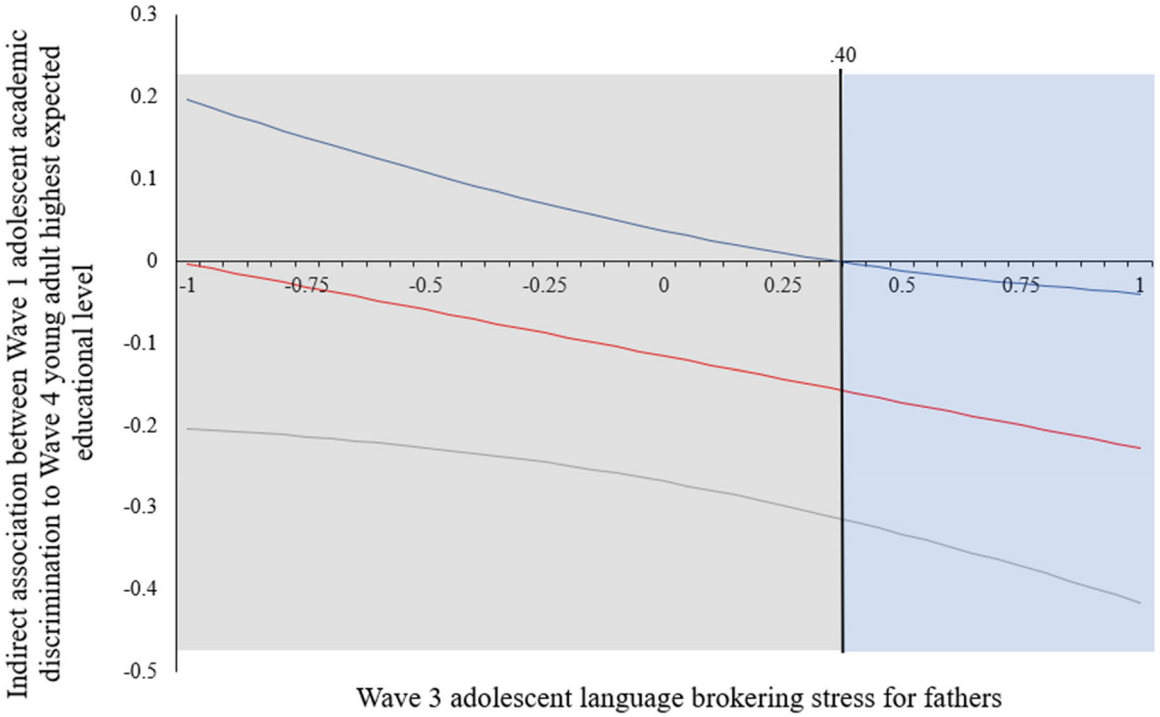


**FIGURE 9** | Johnson–Neyman region of significance of the pathway from W1 adolescent academic discrimination to W4 young adult highest expected educational level at different levels of W3 adolescent language brokering stress for fathers. *Note:* The gray and blue lines represent 95% confidence intervals. The vertical line represents the cutoff for the region of significance. The right side of the vertical line of W3 adolescent language brokering stress for fathers at 0.40 (0.40 points above than the centered mean of W3 adolescent language brokering stress for fathers) is significant. In the gray region, the confidence bands include 0, indicating the pathway from W1 adolescent academic discrimination to W4 young adult highest expected educational level is not significant. In the blue region, the confidence bands are below 0, indicating the pathway from W1 adolescent academic discrimination to W4 young adult highest expected educational level was significantly negative. The range of W3 adolescent language brokering stress for fathers centered around the mean in the current sample as follows: (−0.64, 2.07). The intersection of values of W3 adolescent language brokering stress for fathers equal to three simples slopes at −0.69 (i.e., −1 SD), 0 (i.e., mean), and 0.69 (i.e., +1 SD) for the association from W1 adolescent academic discrimination to W3 adolescent high school grades are presented in Figure 6. Overall, the plot suggests that the pathway from W1 adolescent academic discrimination to W4 young adult highest expected educational level is only significant when adolescents experience a higher level of Wave 3 language brokering stress for fathers.

When assessing the role of school grades and school engagement, poor middle school grades (but not school engagement), led to a diminished sense of educational expectations. This is not surprising as school grades provide a clear, quantifiable outcome that provides direct feedback to adolescents regarding their own academic achievements or struggles (Benner and Graham 2009; Berkel et al. 2010); thus, students who receive poor school results may view their scores as concrete feedback of not just their poor performance, but legitimizes the content of academic discrimination, which then inadvertently undermines their beliefs concerning their academic potential (see also expectancy value theory, Wigfield 1994). Moreover, low grades resulting from academic discrimination can further erode students' confidence, as they can indicate reduced access to academic resources, and/or diminished perceptions of teachers' evaluations that can trickle negatively adolescents' assessments of their abilities to attain higher education. Study findings are consistent with the large breadth of longitudinal literature that have demonstrated how discrimination (academic or otherwise) dampens adolescents' school achievement and grades (Hughes et al. 2016); they are also comparable to existing longitudinal work that have linked adolescents' educational (actual and perceived) competence (e.g., self-report grades) and their educational expectations (Aceves et al. 2020; May and Witherspoon 2019). Given the present findings that early academic discrimination can have compounding educational disadvantages to their later educational expectations, there is increased utility in addressing discrimination early (e.g., promoting and advocating for cultural competence training for students and teachers, increasing high school counselors' ability to guide ethnic minority immigrant-origin adolescents, and giving students a platform to voice these concerns) to prevent long-term cascading adverse educational outcomes and help keep adolescents on a positive academic path.

Whereas some existing research have shown that discriminatory experiences in school diminishes adolescents' school engagement, which is in turn linked to lowered educational expectations (Civitillo et al. 2024b; Wang and Eccles 2012), it was surprising that while study results did show that academic discrimination was related to diminished school engagement, school engagement was not ultimately linked to adolescents' educational expectations. Granted that only school grades but not school engagement mediated the path to educational expectations, it may be that school performance matters more and is more relevant in this context than motivation, interest, and effort exerted for schoolwork through school engagement. One strength of the present study is that it examined both school

performance (i.e., school grades) and interest and effort (i.e., perceptions of school engagement) measures in the academic setting within the same study to test how they may differentially implicate adolescents' education expectations. Evidently, however, there remains a need for more research on the topic to properly explicate the current findings, particularly around findings for school engagement.

Of note, sensitivity analyses confirmed the robustness of the direction of the pathway from academic discrimination to school grades and then to educational expectations (and not from academic discrimination to educational expectations and then to school grades). Previous research has suggested the possibility that early lower educational expectations can set students on a trajectory of lower academic achievement and potentially diminish academic performance (Castro et al. 2024) and school engagement (Verkuyten et al. 2019). As adolescents progress through school, they may not feel supported, encouraged, or possess opportunities necessary for them to excel academically. The cumulative effect of these expectations may lead to widening gaps in knowledge and skills compared to their peers. The use of a longitudinal data set here, however, enabled us to test the directionality among these constructs. Study findings suggest it is more likely that experiences with academic discrimination during middle school are more likely to be linked to Mexican-origin adolescents' school grades and then to their educational expectations.

An important addition in the present work is the inclusion of family contexts in understanding how academic discrimination affects educational expectations; more specifically, the study assessed how adolescents' subjective experiences towards language brokering (i.e., feeling more positive about their relationship with their parents because of language brokering; feeling stress about language brokering for their parents) can spillover to the academic setting and attenuate or exacerbate the links of academic discrimination on adolescents' educational expectations through school grades. Specifically, adolescents' (1) enjoyment of more positive relationship with their parents because of language brokering for their English-limited parents buffered, and (2) experiences of more language brokering stress for their parents exacerbated, the negative link from academic discrimination to attained school grades. Johnson–Neyman analyses further identified the condition when academic discrimination is particularly detrimental in affecting adolescents' education expectations: when positive feelings for the relationship with fathers because of language brokering was low (0.25 points lower than the centered mean of adolescents' positive relationship with fathers tied to language brokering) or when stress about language brokering was high (0.40 points greater than the centered mean of stress), academic discrimination appeared to be especially harmful for young adults' educational expectations through its detrimental impact on school grades.

Study findings concerning language brokering are not surprising given that language brokering involves translating and interpreting between languages, which have been related to improved cognitive skills such as problem-solving, multitasking, and critical thinking (Kim et al. 2024). Mexican-origin adolescents who feel empowered by their role as language brokers (likely the same group of youths who hold more positive feelings with their fathers because of language brokering and those who were less stressed about language brokering) may develop a sense of agency and control (Kim et al. 2020; Park et al. 2015), which can help them persist in their academic efforts and achieve good grades despite discriminatory experiences. Especially for youths who come to value their brokering activities across the home and other daily spaces, these adolescents may further develop a sense of responsibility to excel in school to better position themselves to provide support to their families and communities in the future (Nair et al. 2021). Future studies should consider conducting qualitative interviews to further explore how both the positive and negative aspects of language brokering influence adolescents' coping strategies in response to school-related stressors, such as academic discrimination, and how these strategies, in turn, affect their academic engagement and performance. Given also that language brokering is an entrenched family life condition that adolescents cannot simply opt out of, schools can play an active role in supporting youth by developing language programs that promote heritage language maintenance alongside training in translation and interpretation between the heritage language and English. Schools might also provide access to electronic dictionaries, translation software, and support the establishment of language clubs where students can practice their heritage language skills, share their language brokering experiences, and learn from each other. By enhancing youth's capabilities in language brokering, these programs could help reduce the stress associated with language brokering and foster cultural assets to protect youth from the detrimental impact of academic discrimination on their educational expectations.

Interestingly, the present study found that both having a positive relationship with parents because of, and stress related to, language brokering functioned as moderators only for fathers and not for mothers for the indirect effects from academic discrimination to the more distal educational expectations. Fathers may be perceived as authority figures; thus enjoying more positive relationship with fathers due to language brokering and feeling less stressed about language brokering for fathers (as compared to mothers) can enhance a child's sense of validation and encouragement regarding their academic pursuits, while reinforcing the importance of education and fostering higher educational expectations, thereby moderating the negative effects of discrimination in the school setting (Taylor and Behnke 2005). Additionally, in many Mexican-origin households where traditional gender roles can place different expectations on fathers and mothers, fathers are often more involved in external matters outside the household, including interactions with institutions like schools. As such, children may perceive language brokering for their fathers as more critical in terms of navigating academic discrimination and enhancing educational expectations (Aceves et al. 2020). While adolescents may be interacting more with mothers on a day-to-day basis (Shen and Dennis 2019), maternal support may assume emotional and social support; as such, the perceived impact of brokering for mothers (and the associated positive and stress experiences) may be diminished when linked to educational outcomes compared to fathers, who are seen as more relevant to formal education and career success. Study findings can therefore be applied to interventions that target

promoting positive brokering experiences and reducing stressful translation experiences with parents, specifically for adolescents' fathers, to yield increased efficacy.

Some of the strengths for the present study include its longitudinal design, which helped to understand the long-term consequences of academic discrimination in middle high school into emerging adulthood (and the temporal effects of study constructs). The focus on a specific but relatively less explored type of discrimination in the school setting also highlights the additional stressor that Mexican-origin adolescents have to face during their schooling years. The study also considered the specific interplay between school and family in a sample of immigrant-origin youth, to highlight how different macro systems and levels come together to affect adolescents' development. The study's exploration of adolescents' experiences with language brokering for both their mothers and fathers not only provided a more holistic account of the parent-child dynamic, but also helped to identify the gendered patterns of parents' language brokering interactions on adolescents' education expectations.

There are, however, important limitations to highlight. First, the study recruited a sample of Mexican-origin families, and the niche sample used here may mean that study findings may not generalize to other populations due to the sample's unique sociocultural experiences. That said, considering the prevalence of language brokering in Mexican-origin households (Chao 2006) and that Mexican-origin youths possess intersecting identities (i.e., both ethnic minority and immigrant), it is likely that the effects of academic discrimination on this population may be amplified (Ojeda and Flores 2008), which emphasizes the need for more research with this sample. Future work remains necessary to understand how the present findings extend to nonimmigrant households or even to other immigrant samples who also have to engage in language brokering (i.e., Asian immigrant families) to increase external validity of study findings. Second, this study did not differentiate key aspects of academic expectations and school engagement. Most existing research in this area, including the current study, has focused primarily on long-term expectations (i.e., highest educational attainment), overlooking short-term expectations (e.g., grades), which could serve as monitoring tool and have a strong influence on students' actual performance (Huguley et al. 2018). Likewise, school engagement is a multidimensional construct (i.e., cognitive, affective, and behavioral), with each dimension showing distinct associations with discrimination (Civitillo et al. 2024a). However, this study assessed only the cognitive dimension, potentially omitting important variation in how discrimination impacts engagement. Future studies could examine both short- and long-term expectations, as well as multiple dimensions of engagement, to capture a more comprehensive picture of how discrimination influence students' academic outcomes.

Next, this study was not able to include other potential moderators such as adolescents' coping mechanisms; such factors may have mitigated the detrimental effects of academic discrimination and could account for null findings with school engagement. Tangentially, other researchers have also demonstrated that parents' own educational expectations for their adolescent children can influence youths' expectations for higher education, which may be important to consider in future work (May and Witherspoon 2019). The study was also unable to account for potential gender differences, and unique dyadic linkages between parent and child (e.g., mother–daughter *vs.* father–son interactions) because of the small sample size of fathers in subsequent waves of data collection. It would be crucial for future research to recruit a larger and perhaps more diverse sample (i.e., less ethnically homogeneous) and include additional relevant moderators to address the limitations highlighted here.

All in all, the current study examined how experiences with the relatively understudied construct of academic discrimination can have downstream consequences on adolescents' school grades (but not their engagement) and to young adults' educational expectations. The study further revealed language brokering as a potential moderator that may attenuate or exacerbate the linkages from academic discrimination to their educational expectations. Including other moderators (or the inclusion of conceptually relevant explanatory mechanisms) and recruiting a larger sample with more diverse populations can help researchers and scholars better understand how academic discrimination implicates educational expectations over time.

### Author Contributions

**Su Yeong Kim:** conceptualization, data curation, funding acquisition, methodology, project administration, resources, supervision, writing – original draft, writing – review and editing. **Yayu Du:** formal analysis, methodology, software, validation, visualization, writing – original draft. **Chantal Alvarado:** formal analysis, writing – original draft. **Lester Sim:** writing – original draft. **Wen Wen:** methodology, software, validation, visualization, writing – review and editing. **Tianlu Zhang:** validation, writing – review and editing. **Jingyi Shen:** validation, writing – review and editing.

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### Ethics Statement

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. All study materials and procedures were approved by the institutional review board at the University of Texas at Austin (2015010006).

## Consent

Informed consent was obtained from all individual participants included in the study.

## Conflicts of Interest

The authors declare no conflicts of interest.

## Peer Review

The peer review history for this article is available at https://www.webofscience.com/api/gateway/wos/peer-review/10.1002/jcop.70033.

## Data Availability Statement

Data and analysis codes are available from the first author upon reasonable request.

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