

Original Paper

Parental Educational Attainment and Frequency of Marijuana Use in Youth: Hispanics' Diminished Returns

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Abstract

Background: While socioeconomic status (SES) indicators such as parental educational attainment show robust associations with health behaviors such as substance use, the protective effects of these indicators may differ across racial groups. This phenomenon of weaker associations between SES indicators and health outcomes for marginalized and minoritized groups relative to non-Hispanic White people has been labeled "Marginalization-related Diminished Returns" (MDRs). Here, we test both whether parental educational attainment is associated with marijuana use frequency in youth as well as whether we observe racial and ethnic variation in this association consistent with MDRs.

Methods: This study used data from the cross-sectional 2019 Monitoring the Future survey (MTF 2019). Participants included 29,230 youth who were either Hispanic (24.1%), non-Hispanic Black (16.1%), or non-Hispanic White (59.9%). We used weighted logistic regression models to test for (1) associations between maternal educational attainment and youth cannabis use frequency as well as (2) moderation of this association by race/ethnicity, while adjusting for the complex sample design of the MTF 2019 data. Age, sex, father presence, and maternal employment were entered into models as covariates. **Results:** Overall, children born to mothers with higher educational attainment reported less frequent marijuana use than peers born to mothers with lower educational attainment. However, this association was significantly weaker in Hispanic versus non-Hispanic White youth. **Conclusion:** The strength of the association between parental educational attainment and youth marijuana use frequency appears to differ across ethnic groups. Specifically, we observed that whereas non-Hispanic White youth from high-SES families tend to report less marijuana use than peers from lower-SES families,

Hispanic youth report roughly equal levels of use across the full SES spectrum. This finding is in line with the MDRs framework and may reflect factors such as structural racism, social stratification, and the marginalization of ethnic minority families in the US.

Keywords

parental education, marijuana, cannabis, socioeconomic status, population groups

1. Background

It is well-established that indicators of socioeconomic status (SES) tend to show robust, inverse associations with most health risk behaviors, including youth substance use. However, these SES indicators may have different meanings and implications across racial and ethnic groups, leading, in some cases, to different patterns of association. Researchers and theoreticians have proposed several explanations to account for these differences. For example, Kaufman has described this issue as the poor overlap between SES across racial and ethnic groups and residual confounding of race/ethnicity due to unmeasured SES indicators (Kaufman, Cooper, & McGee, 1997). Navarro has referred to “race and SES,” not “race or SES” as causes of health disparities, referring to the complex interplays between race and SES (Navarro, 1989, 1990, 1991). Ceci has suggested that the “Have-Nots” may gain less health than the “Haves” from the same SES indicators due to their lower readiness to uptake and mobilize their resources (Ceci & Papierno, 2005). Finally, Assari has used the term Marginalization-related Diminished Returns (MDRs) (Assari, 2017; Assari, 2018a) to describe this phenomenon. These MDRs refer to weaker economic and health effects of SES indicators such as parental educational attainment for the members of marginalized groups, particularly racial and ethnic minorities, than US-born heterosexual non-Hispanic Whites (Assari, 2017; Assari, 2018a). While the MDRs framework for understanding SES and race has been articulated only recently, many others have reported patterns of association consistent with MDRs both before and since (Bell & Thorpe Jr, 2020; Farmer & Ferraro, 2005; D. L. Hudson, Bullard, et al., 2012; D. L. Hudson, Neighbors, Geronimus, & Jackson, 2012, 2016; D. L. Hudson, Puterman, Bibbins-Domingo, Matthews, & Adler, 2013).

MDRs have been reported for a wide variety of emotional, behavioral, economic, and health outcomes. However, they are best described for the SES effects on self-rated health, depression, chronic disease, and mortality. These MDRs tend to be stronger for SES indicators that are distal (e.g., parental educational attainment) rather than proximal social determinants (e.g., income and employment). This difference likely arises because more social processes can constrain the health benefits of parental educational attainment, whereas fewer can block the health effects of income (Assari, 2018a).

The MDRs framework can be regarded as a paradigm shift in health disparities research for several reasons (Assari, 2017; Assari, 2018a). First, most of the existing literature on health disparities has traditionally viewed poverty and low SES as mechanisms for racial health inequalities. The MDRs framework, in contrast, does not reduce health and health behavior disparities to a problem of poverty. Second, whereas most literature uses mediation models to explain health disparities and group

differences, the MDRs framework makes frequent use of moderated-mediation models and introduces non-additive effects of race/ethnicity and SES, allowing SES effects to vary across groups. These MDRs models are thus more realistic than those that assume universal effects of SES or that “one size fits all”. Finally, the MDRs framework explains why racial and ethnic health gaps may widen rather than narrow over time and why they may increase rather than decrease as SES increases (Assari, 2017; Assari, 2018a).

1.1 Aims

While there are several reports documenting MDRs in the associations between parent educational attainment and different health behaviors, it is not currently known whether this phenomenon applies to youth cannabis use. To address this gap in the literature, we conducted a secondary analysis of the 2019 Monitoring the Future (MTF 2019) survey data to determine the multiplicative effects of race, ethnicity, and parental educational attainment on youth marijuana use frequency. First, we hypothesized an inverse association between parental educational attainment and marijuana use frequency. Second, consistent with the MDRs framework, we hypothesized that this inverse association would be weaker for Hispanic and non-Hispanic Black than non-Hispanic White youth. As a result, we expected that non-Hispanic Black and Hispanic youth with highly educated parents would still report high levels of use. Conversely, we expected non-Hispanic White youth with highly educated parents to report significantly lower marijuana use than peers with less highly educated parents.

2. Materials and Methods

Design and Setting. MTF 2019 is a cross-sectional survey that provides nationally representative estimates for substance use in US youth population. Response rates for 2019 were 89% and 86% for 8th and 10th-grade students, respectively. We included 8th (n = 14,223) and 10th graders (n = 14,595) who were either Hispanic, non-Hispanic Black, or non-Hispanic White for this analysis.

Sample and Sampling. About 130 US high schools participate in the MTF study each year. These schools include both public, private, and Catholic schools. Schools are selected using a multistage sampling design. When a school refuses to participate in the MTF study, that particular school is then replaced with another school with similar geographic and demographic characteristics. From participating schools, 8th, 10th, and 12th grade youth are selected via a three-stage sampling procedure: classrooms and students within schools within geographic areas, which were the primary sampling units. In the MTF study, school participation rates commonly range between 66% and 80% across years.

Main Independent Variable. The main independent variable was maternal education level. This variable was measured using the following item: What is the highest level of schooling your mother completed? Items included 1=“Completed grade school or less”, 2=“Some high school”, 3=“Completed high school”, 4=“Some college”, 5=“Completed college”, and 6=“Graduate or professional school after college”. This variable was treated as a continuous measure, with a higher score indicating higher maternal educational attainment.

Outcome Variable. Our outcome was measured using the following item: “The next major section of this questionnaire deals with various other drugs. There is a lot of talk these days about this subject, but not enough accurate information. Therefore, we still have a lot to learn about the actual experiences and attitudes of people your age. We hope that you can answer all questions, but if you find one which you feel you cannot answer honestly, we would prefer that you leave it blank. Remember that your answers will be kept strictly confidential; they are never connected with your name or your class. On how many occasions (if any) have you used marijuana (weed, pot) or hashish (hash, hash oil) . . . in your lifetime?” Responses were 1=“0 occasions”; 2=“1-2 occasions”; 3=“3-5 occasions”; 4=“6-9 occasions”; 5=“10-19 occasions”; 6=“20-39 occasions”; and 7=“40 or More”. This variable was treated as a continuous measure, with a higher score indicating higher marijuana use frequency.

Covariates. For the demographic variables, we included age (1 = 16 years or older, 0 = less than 16 years old), sex (male = 1, female = 0), father presence (1 = father present, 0 = father absent), maternal employment, metro area (MSA: geographical regions with a relatively high population density at its core), and region of the country.

Race and ethnicity. We examined racial and ethnic group membership as a potential moderator, operationalized as two dichotomous variables: non-Hispanic Black and Hispanic. Non-Hispanic White was the reference group for both variables.

2.1 Analytic Strategy

We used the Survey Documentation and Analysis (SDA) at the Inter-University Consortium for Political and Social Research (ICPSR) to conduct our data analysis. We used the weighted logistic regression analysis for multivariable models to produce Odds Ratios (OR) and the corresponding 95% Confidence Intervals (CI). First, we ran models without interactions. Then we ran models with interactions between race/ethnicity and parental education. All analyses were weighted using the MTF 2019 individual-level sampling weights to make the estimates representative at the national level for the US 8th and 10th-grade population. We considered P -values <0.05 as statistically significant, and all tests were two-sided.

3. Results

Table 1 shows a summary of descriptive statistics for both the overall sample and separated by race/ethnicity. From the total number of 29,230 youth who participated in this analysis, 24.1% were Hispanic, 16.1% were non-Hispanic Black, and 59.9% were non-Hispanic White. Non-Hispanic Black youth were slightly older than Hispanic and Non-Hispanic White youth. Non-Hispanic White youth were slightly more likely to be male than Hispanic and Non-Hispanic Black youth. Hispanic youth were least likely to have an employed mother. Maternal education was highest in Non-Hispanic White and lowest in Hispanic youth. The highest father presence was in Non-Hispanic White youth, and the lowest father presence was in Non-Hispanic Black youth. Hispanic youth reported slightly more frequent marijuana use than their Non-Hispanic White and Non-Hispanic Black peers.

Table 1. Descriptive Data overall and by Race/ethnicity

| | Non-Hispanic Black | Hispanic | Non-Hispanic White | All |
|---------------------------|------------------------|------------------------|-------------------------|-------------------------|
| | % | % | % | % |
| | Weighted N | Weighted N | Weighted N | Weighted N |
| Age | | | | |
| < 16 years | 41.7 763.5 | 45.6 1,279.0 | 43.7 2,915.9 | 43.9 4,958.4 |
| ≥16 years | 58.3 1,067.6 | 54.4 1,525.9 | 56.3 3,753.3 | 56.1 6,346.8 |
| Sex | | | | |
| Male | 51.2 1,760.4 | 49.5 2,553.9 | 50.4 6,484.1 | 50.3 10,798.4 |
| Female | 48.8 1,676.0 | 50.5 2,605.9 | 49.6 6,384.7 | 49.7 10,666.6 |
| Employed Mother | | | | |
| No | 13.8 466.0 | 23.4 1,187.9 | 17.9 2,304.0 | 18.6 3,957.8 |
| Yes | 86.2 2,918.4 | 76.6 3,887.7 | 82.1 10,540.0 | 81.4 17,346.1 |
| Maternal Education | | | | |
| Grade School | 3.0 89.0 | 15.3 652.0 | .6 75.7 | 4.3 816.7 |
| Some High School | 9.1 272.0 | 19.7 837.6 | 5.2 621.0 | 9.0 1,730.7 |
| High School Grad | 21.9 655.3 | 26.6 1,131.0 | 16.0 1,904.4 | 19.3 3,690.7 |
| Some College | 17.8 534.0 | 14.5 618.0 | 15.5 1,841.6 | 15.6 2,993.6 |
| College Grad | 27.1 811.1 | 15.1 642.3 | 39.2 4,656.2 | 31.9 6,109.6 |
| Grad School | 21.1 632.3 | 8.8 375.6 | 23.4 2,784.2 | 19.8 3,792.1 |
| Father Present | | | | |
| No | 42.6 1,380.7 | 22.3 1,118.3 | 13.5 1,709.8 | 20.1 4,208.8 |
| Yes | 57.4 | 77.7 | 86.5 | 79.9 |

| | | | | |
|--------------------------------|-------------|-------------|-------------|-------------|
| | 1,860.3 | 3,906.1 | 10,926.0 | 16,692.3 |
| METRO STAT AREA | | | | |
| Non- Standard metro | 12.7 | 11.0 | 23.6 | 18.8 |
| stat area (SMSA) | 441.3 | 575.5 | 3,066.5 | 4,083.2 |
| Standard metro stat | 87.3 | 89.0 | 76.4 | 81.2 |
| area | 3,046.5 | 4,648.2 | 9,931.7 | 17,626.5 |
| Region | | | | |
| Northeast | 14.4 | 13.3 | 19.1 | 17.0 |
| | 502.9 | 695.2 | 2,488.0 | 3,686.1 |
| Midwest | 16.9 | 11.9 | 29.6 | 23.3 |
| | 588.5 | 622.9 | 3,853.1 | 5,064.5 |
| South | 60.8 | 41.9 | 32.8 | 39.5 |
| | 2,120.5 | 2,189.7 | 4,264.8 | 8,574.9 |
| West | 7.9 | 32.8 | 18.4 | 20.2 |
| | 276.0 | 1,715.9 | 2,392.3 | 4,384.3 |
| Marijuana Use Frequency | | | | |
| 0 occasions | 71.9 | 70.6 | 78.9 | 75.8 |
| | 2,372.5 | 3,558.4 | 10,117.8 | 16,048.7 |
| 1-2x | 9.9 | 8.7 | 6.5 | 7.6 |
| | 326.0 | 439.6 | 837.5 | 1,603.0 |
| 3-5x | 4.4 | 4.5 | 3.2 | 3.7 |
| | 145.6 | 226.0 | 411.9 | 783.5 |
| 6-9x | 2.8 | 2.3 | 2.0 | 2.2 |
| | 92.8 | 115.3 | 256.5 | 464.6 |
| 10-19x | 2.9 | 3.6 | 2.1 | 2.6 |
| | 96.1 | 179.8 | 273.6 | 549.5 |
| 20-39x | 2.1 | 2.2 | 1.7 | 1.9 |
| | 69.3 | 113.1 | 223.6 | 406.0 |
| ≥40x | 6.0 | 8.1 | 5.5 | 6.2 |
| | 198.0 | 410.3 | 706.8 | 1,315.1 |

Figure 1 shows the distribution of maternal education by race/ethnicity. Hispanic families had the lowest maternal education, and non-Hispanic White families had the highest maternal education.

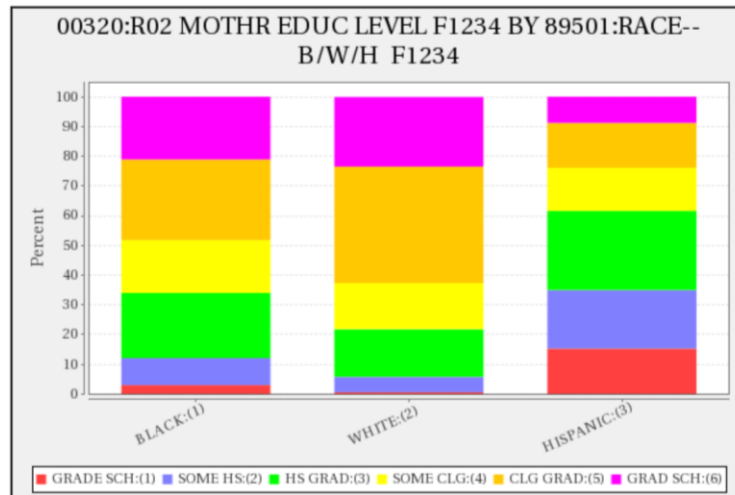


Figure 1. Distribution of Parental Education by Race and Ethnicity

Figure 2 shows the distribution of marijuana use frequency by race/ethnicity. Hispanic youth had the highest marijuana use frequency.

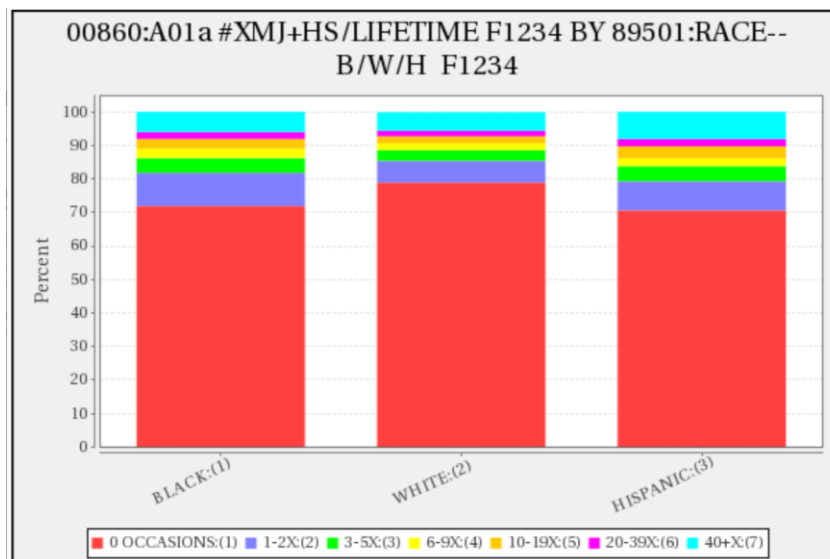


Figure 2. Distribution of Marijuana Use Frequency by Race and Ethnicity

As shown by Table 2, males and youth above age 16 also reported higher marijuana use frequency. School in the standard metro area was a risk factor, and father presence was a protective factor against marijuana use frequency in youth. Race and ethnicity did not show any main effects on marijuana use frequency in youth, meaning that non-Hispanic Black, Hispanic, and non-Hispanic White youth did not show any difference in their marijuana use frequency. While maternal education was protective against youth marijuana use frequency, this effect was weaker for Hispanic youth than non-Hispanic White youth. Figure 3 shows the interaction between parental education and ethnicity.

Table 2. Summary of Logistic Regression Models without (M1) and with (M2) Parental Education by Race/ethnicity Interactions

| | M1 | | | | | M2 | | | | | | |
|--|-------------|-------|-------|----------|--------|------|-------|-------|-------|----------|--------|------|
| | B | SE(B) | Beta | SE(Beta) | t | p | B | SE(B) | Beta | SE(Beta) | t | p |
| Sex (MALE) | .137 | .040 | .034 | .010 | 3.408 | .001 | .137 | .040 | .034 | .010 | 3.409 | .001 |
| Race/Ethnicity | | | | | | | | | | | | |
| NON- HISPANIC WHITE | (reference) | | | | | | | | | | | |
| NON- HISPANIC BLACK | -.020 | .061 | -.004 | .011 | -.321 | .748 | -.189 | .198 | -.034 | .036 | -.952 | .342 |
| HISPANIC | .076 | .055 | .016 | .012 | 1.387 | .166 | -.235 | .143 | -.050 | .030 | -1.648 | .100 |
| Father Present | -.447 | .051 | -.091 | .010 | -8.704 | .000 | -.436 | .052 | -.089 | .011 | -8.452 | .000 |
| Age (16 OR + YRS) | .144 | .041 | .036 | .010 | 3.537 | .000 | .142 | .041 | .036 | .010 | 3.495 | .001 |
| SCHOOL TYPE | | | | | | | | | | | | |
| (STANDARD METRO) | .183 | .053 | .036 | .010 | 3.453 | .001 | .186 | .053 | .036 | .010 | 3.506 | .000 |
| Region | | | | | | | | | | | | |
| NORTHEAST | (reference) | | | | | | | | | | | |
| MIDWEST | -.117 | .064 | -.025 | .014 | -1.836 | .067 | -.114 | .064 | -.025 | .014 | -1.792 | .074 |
| SOUTH | -.058 | .059 | -.014 | .015 | -.984 | .326 | -.056 | .059 | -.014 | .015 | -.954 | .340 |
| WEST | .229 | .068 | .045 | .013 | 3.357 | .001 | .227 | .068 | .045 | .013 | 3.329 | .001 |
| Maternal Employment | .025 | .054 | .005 | .010 | .466 | .641 | .027 | .054 | .005 | .010 | .503 | .615 |
| Maternal Education | -.116 | .016 | -.081 | .011 | -7.309 | .000 | -.148 | .022 | -.104 | .015 | -6.803 | .000 |
| Maternal Education x NON-HISPANIC BLACK | | | | | | | .038 | .044 | .031 | .035 | .878 | .380 |
| Maternal Education x HISPANIC | | | | | | | .084 | .036 | .065 | .027 | 2.358 | .019 |
| Constant | 2.660 | .115 | | | 23.102 | .000 | 2.794 | .132 | | | 21.242 | .000 |

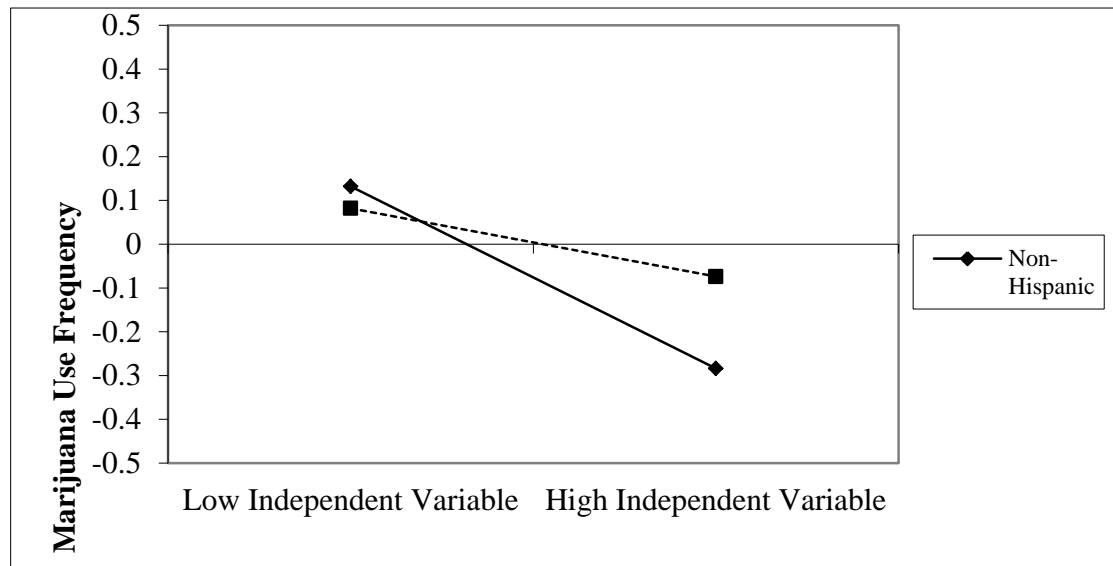


Figure 3. Interaction between Ethnicity and Parental Education on Frequency of Marijuana Use

4. Discussion

In this large, cross-sectional survey completed by a nationally-representative sample of U.S. youth, high parental educational attainment was associated with a lower frequency of youth marijuana use. However, race and ethnicity moderated this association. We observed a weaker inverse association for Hispanic than non-Hispanic White youth. As a result, Hispanic youth with highly educated parents remained at higher-than-expected risk of frequent marijuana use.

The first finding is in line with fundamental cause theory, the social determinants of health framework, and other SES effects (Clouston & Link, 2021; D. Hudson, Banks, Holland, & Sewell, 2019; Link & Phelan, 1995; Phelan, Link, Diez-Roux, Kawachi, & Levin, 2004). The second finding aligns with recent observations that the effects of SES indicators such as parental education on obesity, depression, anxiety, suicide, internalization, externalization, and self-rated health are all weaker for Hispanic than non-Hispanic White youth and adults. These MDRs may explain why we observe a higher-than-expected risk of chronic diseases (Assari, 2019; Assari & Caldwell, 2019; Assari & Moghani Lankarani, 2018a), disability, hospitalization, and mortality for high SES Hispanic and non-Hispanic Black families, while the same risks remain low in non-Hispanic Whites with similar SES. As a result of these MDRs, we see smaller than expected health effects of investments on equalizing SES across racial and ethnic groups.

This is the first time MDRs have been documented for marijuana use. Similar MDRs exist for mental (Assari, Lapeyrouse, & Neighbors, 2018), behavioral (Assari & Mistry, 2018, 2019), and physical health (Assari & Moghani Lankarani, 2018a), as well as healthcare use (Shervin Assari & Mohsen Bazargan, 2019a; Assari & Hani, 2018). In addition, poor mental health (Assari, 2018b, 2018c), poor sleep (Assari, 2021), and poor diet (Assari, Boyce, Bazargan, Caldwell, & Mincy, 2020), high substance use (Assari, Farokhnia, & Mistry, 2019; Assari & Mistry, 2018; Shervin & Ritesh, 2019) is

also shown in high SES non-Hispanic Black and Hispanic people. However, this literature is mainly on tobacco products (Assari, 2018a; Assari & Lankarani, 2016). The unique contribution of this work is the expansion of this literature to marijuana use frequency of youth.

A wide range of structural, social, and behavioral mechanisms may explain these MDRs, interfering with the returns of parental educational attainment and how it translates to employment, income, wealth, and residential area. Most of these processes are racialized in the US, so they generate less advantageous outcomes for Hispanic and non-Hispanic Black families (Assari, 2017; Assari, 2018a). For example, highly-educated parents tend to work in jobs with lower pay and lower occupational prestige if they are Hispanic or non-Hispanic Black. Similarly, highly educated non-Hispanic Black and Hispanic people tend to work in jobs with higher stress and exposure to toxins relative to their White counterparts (S. Assari & M. Bazargan, 2019). The racial composition of the workplace may also be associated with discrimination for highly educated non-Hispanic Black and Hispanic employees (Assari & Moghani Lankarani, 2018b). As a result, highly educated racial/ethnic minority families (Assari, 2017; Assari, 2018a) remain at risk of economic insecurity (Assari, 2018b), stress (Shervin Assari & Mohsen Bazargan, 2019b), living in poor residential areas (Assari, Boyce, Caldwell, Bazargan, & Mincy, 2020), and low wealth (Assari, 2020). Thus, interwoven complex social processes may explain why highly educated Hispanic and non-Hispanic Black families remain at behavioral, economic, and health risk.

4.1 Limitations

We acknowledge several limitations. First, we used cross-sectional data, which limited our ability to infer temporal ordering or cause. Nevertheless, it is reasonable to assume that parental educational attainment typically precedes youth substance use. Second, the sample size was much more limited for Hispanic and non-Hispanic Black than non-Hispanic White youth, perhaps limiting our ability to compare race and ethnic specific models. However, these differences are present in almost all studies of nationally-representative samples. Third, we examined only marijuana use and not use of other substances. Future work should examine whether the MDRs seen here generalize to other substances. Similarly, due to sample constraints, we were not able to examine other SES indicators or other racial and ethnic groups, such as Native Americans. Finally, this study did not include some confounders such as region, peers use, or availability of substances. Given these limitations, the results should be interpreted with caution. Despite all these limitations, this study makes a unique contribution to the literature by showing that MDRs also hold for youth marijuana use frequency. MDRs for alcohol and nicotine use frequency have been already documented (Assari, Caldwell, & Bazargan, 2019; Assari, Farokhnia, et al., 2019; Assari, Smith, Saqib, & Bazargan, 2019).

4.2 Implications

Results suggest that addressing substance use in ethnic minority youth may require more than interventions that seek to simply improve education of ethnic minority families or reduce poverty. Indeed, we suspect that achieving this aim will require first identifying the processes responsible for the

MDRs observed here and in other studies (Assari, 2020) and then seeking to address them with a series of multilevel societal policies designed to equalize the living conditions of individuals and families of different ethnicities. This distinction is important because solutions to the inequalities and disparities than drive the lower returns of SES indicators for Hispanic families (i.e., MDRs) will likely differ from solutions to the problem of lower educational attainment in these families. Unless we go beyond poverty elimination to address the drivers of MDRs, SES indicators such as parental education may continue to operate as a *source* of ethnic health disparities rather than a solution.

4.3 Conclusion

As shown here, SES indicators such as parental educational attainment show different patterns of association with youth marijuana use frequency across ethnic groups. Youth from highly educated Hispanic families remain at risk of frequent marijuana use, a pattern different from their non-Hispanic White counterparts. Thus, ethnic disparities in youth marijuana use frequency remain across the full SES spectrum. These results are consistent with the MDRs framework and suggest that ethnic health disparities should not be reduced to the problem of poverty or low human capital. These MDRs may reflect social stratification, structural racism, and marginalization that negatively impact the behavioral health of ethnic minority families across SES levels.

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