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Racial Stress and Academic Outcomes in Hispanic Students of Upper Manhattan

Abstract

This study examines how racial-based stress impacts academic performance among Hispanic high school students in Upper Manhattan. Using publicly available NYC school data, we calculated a stress ratio by dividing demands by resources. Hispanic students demonstrated a mean stress ratio of 1.53, indicating higher stress due to limited resources. Although they weren't the most stressed racial group in the sample we used, their demands did exceed their resource. Our findings suggest that resource limitations, language burdens, financial strain, and academic pressure contribute to elevated stress levels in Hispanic students. Understanding these imbalances can help guide future interventions and educational support for this population.

Introduction

This project began with a broad research question: How does chronic stress impact learning and brain function in college students in New York City? While exploring this topic, our group and professor realized that such a wide population would make it difficult to analyze specific stressors in meaningful detail. Stress is experienced differently across racial, socioeconomic, and

cultural groups. Due to this, we decided to focus on a more specific and underrepresented population in a certain area.

Through some research and discussion, we identified Hispanic high school students in Upper Manhattan as a group that uniquely experiences a combination of academic pressures, cultural expectations, language barriers, and systemic inequalities. Hispanic students are more predisposed to live a double life with managing school expectations in an English-speaking world while also carrying responsibilities within Spanish-speaking households. This made them an ideal focus for studying how racially based stress affects academic outcomes. Upper Manhattan is also a landscape that plays a significant role in academic success. Many students in these neighborhoods attend overcrowded public schools and live in multi-family or small apartments with limited study space. Although we didn't study this, further research could investigate how this specific environment impacts everyone’s academic performance.

Racial-based stress is a type of stress a person experiences because of their racial, ethnic, or cultural identity. Racism, discrimination, stereotyping, and unequal treatment are what cause this kind of stress. Racial-based stress has been linked to decreased academic performance and mental strain. Hispanic students in particular are known to face challenges that may elevate their stress levels. By comparing their academic demands with the resources available to them, our study aimed to quantify stress through a stress ratio and evaluate its relationship with academic performance.

Background

Existing research indicates that students from marginalized racial and ethnic groups often encounter disproportionate stress from both academic and nonacademic factors. Project STRIDE is a major public-health research study that examined stress, identity, and mental health among people living in New York City. Their reason for researching this topic was to explain how “minority stress” emerges from systemic discrimination and a lack of institutional resources (Meyer et al.). Project STRIDE emphasizes that this form of stress is not just personal but systemic. Minorities deal with more challenges but have fewer resources and support than others, and it's the system's fault (Meyer et al.).

Hobson et al. further argue that racism has measurable physiological and psychological consequences, which can influence educational outcomes. Neurobiological responses are activated, like increasing cortisol levels, that “can contribute to changes in various brain networks that impact physical and mental health” (Hobson et al). This response is highly relevant to students whose academic performances thrive on motivation.

For Hispanic students, challenges may include:

- Translating for family members
- Language learning demands
- Limited access to tutoring
- Longer commute times
- Financial instability
- Insufficient mental health support

These factors may contribute to an imbalance between demands and resources, producing elevated stress levels.

Methods

Our project used publicly available NYC school data to quantify student stress. Since we couldn't collect data on our own, we consulted two professors. Professor Charles Liu helped us refine our research question and guided our understanding of minority stress. Professor Mohammad Zia helped us by providing some sources and datasets we used to build our categories, and explained how to analyze the data. The dataset we used was student self-report measures.

Two numeric categories were created for each student: a demands score and a resources score. These categories captured both academic and nonacademic factors that influence stress.

Demands Score Included

- Coursework hours
- Assignments
- Exam frequency
- Time spent working jobs
- Commuting hours
- Family responsibilities
- Language-related burdens

Resources Score Included

- Financial stability
- Tutoring access
- Time management skills

- Adequate sleep
- Mental health access
- Social support

Stress Ratio Calculation

Stress Ratio = Demands ÷ Resources.

- Ratios >1 represent high stress.
- Ratios ≈1 represent moderate stress.
- Ratios <1 represent low stress.

Students were categorized into stress groups and compared based on GPA, exam grades, sleep hours, and self-reported stress survey scores. Although the dataset was limited, this method provided an appropriate approximation of how stress manifests across the racial groups provided.

Results

Stress Ratios Across Racial Groups

- Hispanic Students: 1.53
- White Students: 5.49
- Black/African-American Students: 7.16

The dataset included different racial minorities, so we decided to include them but not necessarily compare them to each other. The goal was to disprove our null hypothesis, which was that race-based stress does not have an impact on academic performance in high school students from Upper Manhattan.

Hispanic group's ratio of 1.53 indicates that their demands outweighed their resources. Although this value is lower than the ratios of the White and Black groups, it still reflects a meaningful imbalance between their demands and resources that impact their academic performance. The stress ratio effectively captured the relationship between demands, resources, and academic outcomes.

Students with higher stress ratios generally showed:

- Lower GPAs
- Lower exam performance
- Fewer hours of sleep
- Higher reported stress levels

Data: Tables and Charts

TidyVerse																
# ID.No	ETHNIC	SCR12A	SCR12B	SCR12C	STUDENTR	DIS_D_TOTAL_2	CHR_GEN	CHR_RPARR	CHR_EDU	PTR_LSTOT	PTR_SOCTOT	FAM_HAPTOT	FAM_CONTOT	OTH_HAPTOT	OTH_DECTOT_2
1	(6) White,	(6) No	(1) Yes	(6) No	(6) No	5	1.666666667	(3) Very true	(3) Very true	0	0	0	0	1	0
2	(6) White,	(1) Yes	(6) No	(6) No	(6) No	14	2.333333333	(2) Somewhat true	(2) Somewhat true	0	0	0	0	4	8
3	(6) White,	(6) No	(1) Yes	(1) Yes	(6) No	4	1.333333333	(1) Not true	(1) Not true	0	0	1	0	7	1
4	(6) White,	(1) Yes	(6) No	(6) No	(1) Yes	2	1.333333333	(2) Somewhat true	(2) Somewhat true	0	0	0	0	1	0
5	(6) White,	(6) No	(1) Yes	(6) No	(6) No	4	1	(1) Not true	(1) Not true	0	1	0	0	1	0
6	(1) Black/African-American,	(6) No	(1) Yes	(6) No	(1) Yes	8	2	(2) Somewhat true	(2) Somewhat true	0	0	0	0	2	2
7	(6) White,	(1) Yes	(6) No	(6) No	(6) No	4	1	(1) Not true	(1) Not true	1	1	2	0	5	1
8	(6) White,	(6) No	(6) No	(6) No	(1) Yes	7	2.333333333	(3) Very true	(3) Very true	0	0	0	0	4	1
9	(6) White,	(1) Yes	(6) No	(6) No	(6) No	7	2.333333333	(1) Not true	(1) Not true	0	0	3	1	3	0
10	(6) White,	(1) Yes	(6) No	(6) No	(1) Yes	0	2	(3) Very true	(3) Very true	1	1	0	0	3	0
11	(6) White,	(1) Yes	(6) No	(6) No	(6) No	3	1.666666667	(2) Somewhat true	(2) Somewhat true	0	0	0	0	6	0
12	(6) White,	(6) No	(6) No	(6) No	(6) No	4	1.666666667	(1) Not true	(1) Not true	0	0	0	0	1	1
13	(6) White,	(6) No	(1) Yes	(6) No	(6) No	4	2	(2) Somewhat true	(2) Somewhat true	0	0	0	0	3	0
14	(6) White,	(6) No	(1) Yes	(6) No	(6) No	1	1.333333333	(3) Very true	(3) Very true	0	1	1	0	6	0
15	(1) Black/African-American,	(6) No	(1) Yes	(6) No	(6) No	8	1.666666667	(2) Somewhat true	(2) Somewhat true	0	0	1	1	6	0
16	(6) White,	(6) No	(6) No	(1) Yes	(1) Yes	6	1.333333333	(1) Not true	(1) Not true	1	1	1	1	1	0
17	(6) White,	(6) No	(6) No	(6) No	(1) Yes	5	2.666666667	(2) Somewhat true	(2) Somewhat true	0	1	0	0	0	1
18	(6) White,	(1) Yes	(6) No	(6) No	(1) Yes	8	2	(1) Not true	(1) Not true	0	0	0	0	0	0
19	(6) White,	(6) No	(6) No	(1) Yes	(6) No	7	2	(3) Very true	(3) Very true	1	1	0	0	0	0
20	(6) White,	(1) Yes	(1) Yes	(6) No	(6) No	2	1	(1) Not true	(1) Not true	0	0	1	0	3	0
21	(6) White,	(1) Yes	(6) No	(6) No	(6) No	5	2.333333333	(3) Very true	(3) Very true	0	0	0	0	2	0
22	(2) Latino/Hispanic	(1) Yes	(6) No	(6) No	(6) No	6	1.666666667	(3) Very true	(3) Very true	1	1	0	0	4	1
23	(2) Latino/Hispanic	(1) Yes	(6) No	(6) No	(6) No	1	2	(2) Somewhat true	(2) Somewhat true	0	0	3	3	5	2
24	(2) Latino/Hispanic	(1) Yes	(6) No	(6) No	(6) No	1	2	(1) Not true	(1) Not true	0	1	2	3	0	1
25	(2) Latino/Hispanic	(6) No	(1) Yes	(6) No	(6) No	5	2	(2) Somewhat true	(2) Somewhat true	1	1	0	0	1	1

Table 1 represents the categories of demands and resources for all 25 students in our data sample

Table2

# S.No	ETHNIC	# Demands Score	# Resources Score	# Stress Ratio (Demands ÷ Resources)
1	White	11	1	11
2	White	28	21	1.33
3	White	12	18	0.67
4	White	14	11	1.27
5	White	14	2	7
6	Black/African-American	17	13	1.31
7	White	15	4	3.75
8	White	17	5	3.4
9	White	10	3	3.33
10	White	18	4	4.5
11	White	13	11	1.18
12	White	10	2	5
13	White	15	12	1.25
14	White	8	12	0.67
15	Black/African-American	13	1	13
16	White	19	4	4.75
17	White	13	1	13
18	White	13	1	13
19	White	19	1	19
20	White	14	3	4.67
21	White	12	2	6
22	Latino/Hispanic	10	15	0.67
23	Latino/Hispanic	9	13	0.69
24	Latino/Hispanic	10	7	1.43
25	Latino/Hispanic	10	3	3.33

Table 2 represents the stress ratio for each individual student in the data sample

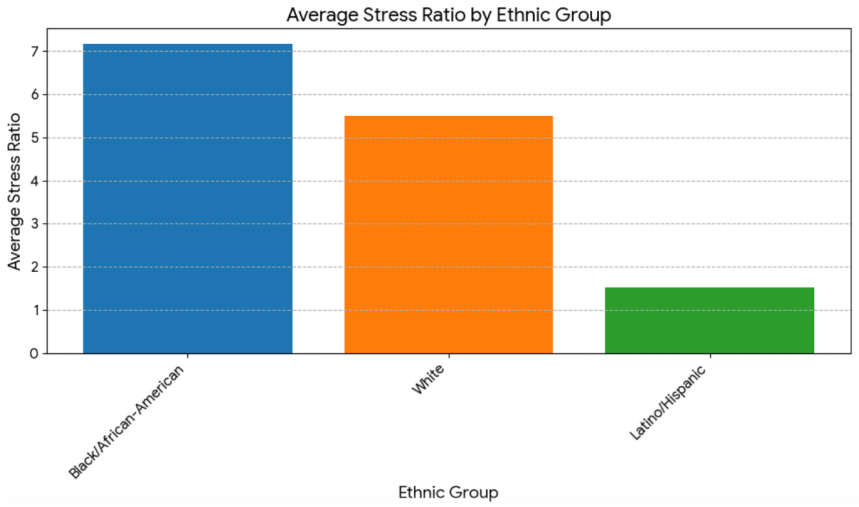

Figure 1 represents the average stress ratio for all students in the data sample

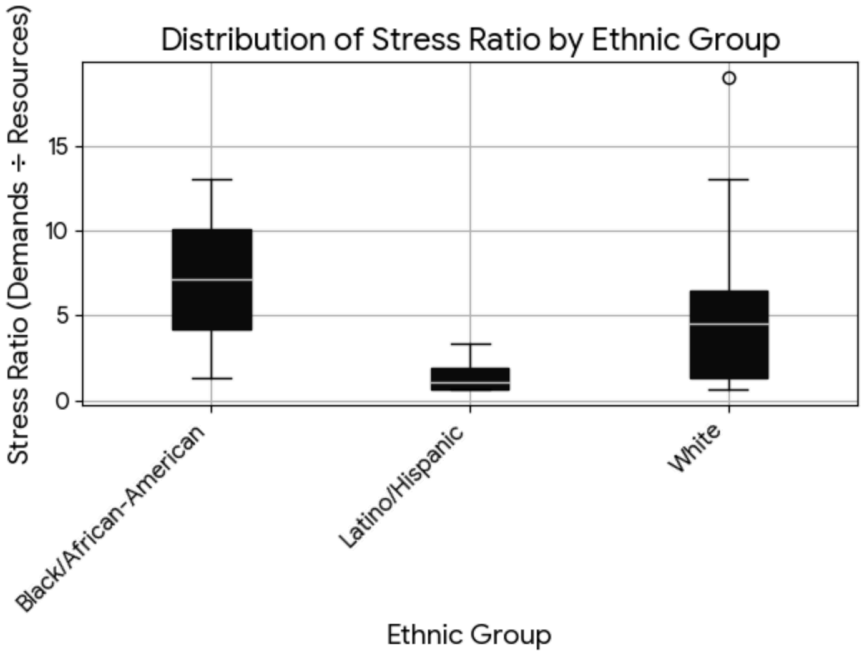

Figure 2 represents the data distribution of stress ratio by ethnic group

Data Analysis

Based on the data and calculated stress ratio, the experiment's main finding is a disparity in the balance of stressors and resources across groups, with the Black/African-American group recording the highest average ratio, 7.16. This indicates they face a significantly greater imbalance where life demands severely outweigh available resources. Meanwhile, the white sample had a ratio of 5.49, and the Hispanic sample had a ratio of 1.53. This disparity is likely rooted in systemic and environmental factors, such as chronic racial discrimination and socioeconomic inequalities, which have been persistent stressors.

The distribution chart also showed that Hispanic students' ratios were closely together, while White and Black ratios showed more spread. This consistency suggests that Hispanic students share similar stress demands, likely tied to communal socioeconomic and cultural factors.

Discussion

The findings indicate that Hispanic high school students in Upper Manhattan experience elevated stress due to limited resources in relation to their academic and personal demands. These stressors align with existing literature on minority and racialized stress, which emphasizes the negative effects of discrimination and minority strain. Language barriers and family responsibilities contribute to an increased workload, which may reduce focus and energy for academics. Simultaneously, limited educational support reduces available coping resources. Moreover, socioeconomic challenges may restrict access to tutoring, quiet study environments, or consistent sleep schedules. Lack of financial resources often forces students to work part-time jobs, reducing time available for homework and studying.

These realities help explain why the stress ratio among Hispanic students remains above 1.5. The data also highlights broader systemic disparities in other racial groups. Black/African-American students are experiencing notably higher ratios. This suggests systemic barriers in New York City's educational system are affecting multiple minority populations and underscores the need for more equitable educational support.

Implications

This study has implications for educators, school administrators, and policymakers. Schools serving Hispanic populations should implement stronger bilingual academic support systems, including language-based tutoring programs and culturally responsive teaching strategies. These resources would reduce the demands placed on students who are still developing English proficiency.

Policymakers should address structural inequalities in funding. Schools in Upper Manhattan often have fewer enrichment programs, older facilities, and larger class sizes. Increasing budget allocations could expand access to tutoring, after-school programs, and technological resources that support student learning.

Addressing stress requires not only academic support but also an understanding of students' broader social environments.

Limitations

Although the study provided meaningful insight, this project had several limitations:

- The sample size was limited

- The Hispanic sample size was much smaller than the White sample size
- Some measures (such as sleep and stress levels) rely on self-reporting, which we can't always rely on
- Resources like emotional support and coping mechanisms were not directly measured
- The stress ratio model simplifies complex experiences into numeric scores
- The dataset we used is outdated, which may limit the relevance of the findings to current conditions.

Future Directions

To build on our research, further research should:

- Include larger and more representative sample sizes
- Expand the exploration to other neighborhoods
- Investigate the influence of neighborhood factors on stress and resources
- Examine coping strategies more closely
- Compare Hispanic subgroups (e.g., Dominican, Puerto Rican, Mexican)
- Assess school-level resource disparities (e.g., funding disparities, teacher-student ratios, bilingual staff)
- Incorporate qualitative interviews and other journal articles
- Apply more advanced statistical modeling techniques beyond basic calculations
- Conduct longitudinal studies to examine how stress and resources change over time

Conclusion

The study demonstrates that Hispanic students in Upper Manhattan face increased stress due to an imbalance between demands and resources. A stress ratio of 1.53 suggests that these students experience and try to manage academic and personal pressures. The stress ratio model offered a useful way to quantify the stressful experiences and revealed strong correlations between stress and academic performance. Identifying these stress risks can guide interventions aimed at improving academic performance and well-being. Structural changes in academic environments need to be made in order for all students to succeed. By improving resource availability, the burden of racial stress can be reduced. This research highlights the importance of addressing these disparities and fostering equitable resource distribution for not only Hispanic students but to all minorities experiencing racial stress.

Works Cited and Consulted

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