

RESEARCH ARTICLE

Parental Human Capital and Adolescents' Executive Function: Immigrants' Diminished Returns

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Abstract

Background. Racial minorities, particularly non-Hispanic Blacks in the US, experience weaker effects of family socioeconomic position (SEP) on tangible outcomes, a pattern called Minorities' Diminished Returns (MDRs). These MDRs are frequently shown for the effects of family SEP on immigrant adolescents' school performance. As a result of these MDRs, immigrant adolescents from high SEP families show worse than expected cognitive outcomes, including but not limited to poor school performance. However, the existing knowledge is minimal about the role of executive function in explaining diminished returns of family SEP on adolescents' outcomes.

Aim. To investigate group differences in effects of parental human capital on adolescents' executive function, we compared non-Hispanic White non-immigrant and immigrant adolescents for the effect of parental human capital on adolescents' executive function.

Methods. This was a cross-sectional analysis that included 2,723 non-twin non-Hispanic White adolescents from the Adolescent Brain Cognitive Development (ABCD) study. The independent variable was parental human capital (parental educational attainment), treated as a continuous measure with a higher score reflecting higher SEP. The primary outcome was adolescents' executive function measured by the stop-signal task (SST). Age, sex, parental marital status, parental employment, family income, and financial difficulties were controlled. Immigration status was the effect modifier.

Results. Overall, high parental human capital was associated with higher task-based executive function. Immigration status showed a statistically significant interaction with parental human capital on adolescents' executive function. This interaction term suggested that high parental human capital has a smaller effect on increasing immigrants' executive function than non-immigrant adolescents.

Conclusion. The boosting effect of parental human capital on executive function is diminished for immigrants compared to non-immigrant adolescents. To minimize the inequalities in executive function-related outcomes such as school performance, we need to address the diminishing returns of existing resources for immigrants. Not only should we equalize groups based on their SEP but also equalize the marginal returns of their existing SEP. Such efforts require public policies that aim for equal processes. As such, social policies should address structural and societal barriers such as xenophobia, segregation, racism, and discrimination that hinder immigrant families' ability to effectively utilize their resources. In a fair society, immigrant and non-immigrant families should be equally able to leverage their SEP resources and turn them into tangible outcomes.

Keywords: Immigration; Immigrants; socioeconomic status; adolescents; cognition; brain; executive function; health equity; health equality

1. Background

Adolescents from marginalized families, including Hispanics, Blacks, and immigrants, are at an increased risk of school dropout and poor academic achievement¹⁻⁶. As academic success in the earlier stages of life is a gateway to future economic and health outcomes later in life⁷⁻¹⁰, it is imperative to

close such adolescents' inequalities if we wish to eliminate subsequent inequalities later in life⁷⁻¹⁰.

Closely associated with social marginalization, is family socioeconomic position (SEP) and parental human capital¹¹⁻¹³. Social marginalization, immigration status, SEP, and parental human capital have all separate, combined, and multiplicative effects

on adolescents' developmental outcomes¹¹⁻¹³. This is mainly because low parental human capital, SEP, and marginalized social identities are commonly associated with economic adversities, stress, trauma, stigma, prejudice, and financial difficulties¹⁴⁻¹⁷.

Among the strongest social determinants of adolescents' outcomes is parental human capital, which is a unique family SEP indicator¹⁸⁻²¹. High parental human capital, commonly measured by parental educational attainment, is linked to a wide range of family SEP indicators such as employment, wealth, and marital status, all of which have influences on the positive developmental and health outcomes of adolescents across domains¹⁸⁻²¹. Regardless of the domain, many studies have documented a link between low parental human capital and associated poverty and financial distress as major risk factors of experiencing behavioral problems and poor health²²⁻²⁴. Parents with high human capital and high-SEP have higher investment and involvement in the life of their adolescents²⁵⁻²⁷. Adolescents from high SEP families are also sent to better schools with more abundant resources²⁸⁻³⁰. High SEP adolescents also have access to a wide range of educational and stimulating resources in their home³¹. Finally, high SEP adolescents are being raised in families with lower stress³²⁻³⁶. All these factors have strong positive effects on adolescents' developmental outcomes³⁷⁻⁴¹.

There are two approaches that researchers have taken to study the effects of social marginalization on adolescents' outcomes. The first approach, a more traditional one, has tried to explain the gap in adolescents' outcomes between the marginalized and non-marginalized groups to lower parental human capital and family SEP of socially marginalized families such as immigrants⁴²⁻⁴⁵. In this view, parental human capital and other family SEP indicators are believed to mediate the effects of social marginalization on adolescents' outcomes⁴⁶⁻⁴⁸. As such, the belief is that enhancing family SEP and closing the gap in SEP would be the

primary strategy for closing the existing adolescents inequalities^{49,50}.

The second strategy, however, proposes that SEP has differential effects on adolescents' outcomes across social groups. Minorities' Diminished Returns (MDRs)^{51,52} are defined as weaker effects of family SEP on tangible outcomes for members of marginalized groups (e.g. immigrants) relative to socially privileged groups (non-immigrants). This view is supported by recent evidence suggesting that family SEP indicators such as parental education⁵³, family income^{54,55}, and marital status⁵⁶ generate more desired outcomes for adolescents which are from non-Hispanic White families than Hispanic, Asian American, or Black families.

As shown by the MDR literature, human capital of parents⁵⁷⁻⁵⁹ generate unequal outcomes for various social groups. Immigrants may differ from non-immigrants in their opportunities to mobilize resources, navigate systems, and secure tangible outcomes in the presence of SEP resources^{52,54,58,60-62}. As a result of these MDRs, compared to their non-immigrant counterparts, immigrants may show worse than expected outcomes despite their family SEP^{51,52,54,55,63}. This is, however, shown for racial and ethnic minorities but not immigrants.

Aims

To extend the existing knowledge on how social marginalization, particularly immigration, impacts adolescents' outcomes, and built on the MDRs literature⁶⁴⁻⁶⁸, we compared immigrant and non-immigrant families for the effects of parental human capital, one of the major family SEP indicators, on adolescents' executive function. We expected a positive association between parental educational attainment and youth executive function, however, we also expected a weaker effect of parental human capital, as one of the main family SEP indicators, on adolescents' executive function

which is a main predictor of school and cognitive performance^{35,69,70}, for immigrant than non-immigrant adolescents.

Methods

Design and settings

We performed a secondary analysis of wave 1 data from the Adolescent Brain Cognitive Development (ABCD) study⁷¹⁻⁷⁵. The ABCD is a landmark adolescents' brain development study in the United States. Detailed information on the ABCD study is available elsewhere^{71,76}.

Participants and Sampling

The ABCD data collection for the study baseline data (wave 1) was performed between 9/1/2016 and 11/1/2018. Participants of the ABCD study were adolescents at age 9-10 years. The ABCD study recruited adolescents from multiple cities across states. Overall, 21 sites recruited adolescents to the ABCD study. The recruitment of the ABCD sample was mainly done through school systems. A detailed description of the ABCD sampling is available here⁷⁷. Four thousand one hundred eighty-eight participants entered our analysis. The eligibility criteria for our analysis was being non-Hispanic White, not being a twin, and having valid data on non-Hispanic White and having valid data on immigration status and the outcome variable *tfmri_sst_al_beh_crgo_rt*, which was a measure of task-based executive function. The ABCD study sample is generalizable to the broader US adolescent population.

Study Variables

The study variables included immigration status, demographic factors (age, sex), family marital status, parental employment, parental human capital (parental education), household income, financial difficulties, and task-based adolescents' executive function.

Confounders

Age. Parents were asked to report the age of their adolescents. Age was a continuous measure in months. Age was also a dichotomous variable: 9 or 10 years old.

Sex. Sex was a dichotomous variable: male = 1, female = 0.

Parental marital status. Parental marital status was a dichotomous variable. This variable was self-reported by the parent who was interviewed. This variable was coded as married = 1 vs. other = 0.

Parental employment. Parental employment was a dichotomous variable. This variable was self-reported by the parent who was interviewed. This variable was coded as at least one parent employed in the household = 1 vs. no employed parent in the household = 0.

Family income. Family income was a continuous measure ranging from 1 to 10, with a higher score indicating higher income. The exact question was, "What is your total combined family income for the past 12 months? This should include income (before taxes and deductions) from all sources, wages, rent from properties, social security, disability and veteran's benefits, unemployment benefits, workman". Responses included 1 = Less than \$5,000; 2 = \$5,000; 3 = \$12,000; 4 = \$16,000; 5 = \$25,000; 6 = \$35,000; 7 = \$50,000; 8 = \$75,000; 9 = \$100,000; 10 = \$200,000.

Financial difficulties. This study measured parental human capital using the following seven items. Participants were asked "In the past 12 months, has there been a time when you and your immediate family experienced any of the following:" 1) "Needed food but couldn't afford to buy it or couldn't afford to go out to get it?", 2) "Were without telephone service because you could not afford it?", 3) "Didn't pay the full amount of the rent or mortgage because you could not afford it?", 4) "Were evicted from your home for not paying the rent or mortgage?", 5) "Had

services turned off by the gas or electric company, or the oil company wouldn't deliver oil because payments were not made?", 6) "Had someone who needed to see a doctor or go to the hospital but didn't go because you could not afford it?" and 7) "Had someone who needed a dentist but couldn't go because you could not afford it?" Responses were 0 or 1. We calculated a sum score (a continuous measure), which ranged from 0 and 1 with a higher score indicating higher financial difficulties. Financial difficulty is an accepted SEP indicator, as it reflects some aspects of the SEP which are not captured by objective SEP indicators such as education and income⁷⁸⁻⁸⁴. Financial difficulties may have some health effects that are not seen by objective SEP^{78,80,81,85-87}.

Primary Outcome

Adolescents' Executive Function. The study also used the stop-signal task (SST)⁸⁸ to measure executive function. The SST applied two runs of 180 trials showing images of a black arrow pointing either right or left displayed on the participants' screen while in the scanner. They were instructed to click the appropriate button corresponding to the arrow direction as quickly as they can after seeing the image using their dominant hand. Thirty of the 180 trials display neither option, signaling the participant to inhibit answering with either option and are randomly dispersed throughout the trials. Executive function in this study was measured using the variable *tfmri_sst_all_beh_crgo_rt*, which referred to the rate of correct "Go" trials. Thus, executive function was measured as the total number of correct "Go" trials in a run. This variable was continuous with a higher score indicating a higher level of executive function⁸⁹⁻⁹². The stop-signal task is a commonly used indicator of adolescents' executive function. SST is reliable and valid⁹³⁻⁹⁵ and is commonly used to measure executive function⁹⁶⁻⁹⁸.

Independent Variable

Parental Human Capital. Parental educational attainment or parental human capital was an interval variable ranging from 1 to 21. This variable was treated as a continuous measure.

Moderator

Immigration status. *Nativity*, also called as *immigration status*, was self-identified by the parents. Immigration was calculated based on the country of birth of the adolescent. This variable was treated as a categorical variable. It was coded 1 for immigrants and 0 for non-immigrants (reference category).

Data Analysis

We used the statistical package SPSS to perform our data analysis. Mean (standard deviation [SD]) and frequency (%) were described depending on the variable type. We also performed a Spearman bivariate test to explore bivariate associations between all the study variables. For our multivariable modeling, we fitted four multiple linear regression models. Our first two models were performed in the overall sample. Our last two models were performed across groups defined based on immigration. *Model 1* was performed without the immigration by parental human capital interaction term. *Model 2* added the interaction term between immigration status and parental human capital (parental educational attainment). *Model 3* was performed in non-immigrant and *Model 4* was performed in immigrant participants. Our models used age, sex, parental marital status, parental employment, family income, and financial difficulties as the covariates. Unstandardized regression coefficient (b), and p-value were reported for each model. P-values equal to or less than 0.05 were significant.

Ethical Aspect

The ABCD study received Institutional Review Board (IRB) approval from the

University of California, San Diego (UCSD). Each adolescent participant provided an assent. Each parent signed informed consent form ⁷⁶. As this analysis was performed on fully de-identified data, our analysis was exempt from a full IRB review.

Results

Descriptives

As shown in Table 1, 2,723, 9-10 years, old adolescents entered to this analysis. From this number, most were non-immigrants (98.4%), and the rest were immigrants (1.6%). Table 1 presents a description of the sample overall and based on immigration status.

Table 1. Data overall and by immigration status ($n = 2,723$).

	All		Non-Immigrant		Immigrant	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Immigrant						
No	2679	98.4	2679	100.0	-	-
Yes	44	1.6	-	-	44	100.0
Sex						
Male	1302	47.8	1278	47.7	24	54.5
Female	1421	52.2	1401	52.3	20	45.5
Age						
9	1526	56.0	1502	56.1	24	55.8
10	1189	43.7	1170	43.7	19	44.2
Parents Employed*						
No	765	28.1	746	27.8	19	43.2
Yes	1958	71.9	1933	72.2	25	56.8
Marital Status						
Not Married	454	16.7	450	16.8	4	9.1
Married	2269	83.3	2229	83.2	40	90.9
	Mean	SD	Mean	SD	Mean	SD
Age (Months)	118.30	7.55	118.30	7.54	118.14	7.94
Household Income	8.20	1.68	8.19	1.68	8.45	1.88
Financial Difficulties*	0.27	0.83	0.27	0.83	0.32	0.86
Parental Human Capital (Parental Education)*	17.55	2.02	17.54	2.02	18.16	1.94
Executive Function- Task (0-1)	0.82	0.14	0.82	0.14	0.83	0.14

SD= Standard Deviation

* $p < 0.05$ for comparison of immigrants and non- immigrants

Bivariates

Table 2 shows a summary of the Spearman correlation matrix between all the study variables in the overall sample.

Immigrant status was associated with a lower SEP and lower executive function. Task-based executive function was positively correlated. Family SEP was positively correlated with task-based executive function.

Table 2. Correlations between study variables (*n* = 2,723).

	1	2	3	4	5	6	7	8	9
1 Immigration status	1.00	-0.02	-0.01	0.03	-0.04*	0.04	0.00	0.05**	0.01
2 Sex (Male)		1.00	0.04*	0.00	-0.00	-0.01	0.02	-0.02	-0.01
3 Age (Months)			1.00	-0.03	0.02	-0.00	0.03	-0.05**	0.20**
4 Parents married				1.00	-0.03	0.37**	-0.26**	0.21**	0.07**
5 Parents employed					1.00	0.20**	-0.10**	0.25**	0.01
6 Household income						1.00	-0.39**	0.48**	0.12**
7 Financial difficulties (n)							1.00	-0.31**	-0.08**
8 Parental human capital (education)								1.00	0.12**
9 Executive function (tfMRI_sst_all_beh_crgo_rt)									1.00

*p < 0.05; **p < 0.01

Multivariate Analysis (Pooled Sample)

Table 3 shows the results of two linear regression models in the overall (total) sample. *Model 1* (Main Effect Model) showed the protective effect of high family SEP on executive function. *Model 2* (Interaction Model) showed a statistically significant

interaction between immigration status and parental human capital on adolescents' executive function, suggesting that the boosting effect of high parental human capital on adolescents' executive function is weaker for immigrant relative to non-immigrant adolescents (Table 3).

Table 3. Summary of linear regressions overall (*n* = 4,188).

	Model 1 Main Effects					Model 2 Interaction Effects				
	B	SE	95% CI	t	p	B	SE	95% CI	t	p
Immigrants	0.01	0.02	-0.03 0.05	0.48	.633	0.40	0.20	0.00 0.79	1.94	.053
Sex (Male)	0.00	0.01	-0.01 0.01	0.02	.988	0.00	0.01	-0.01 0.01	0.02	.981
Age (Months)	0.00	0.00	0.00 0.00	8.50	<.001	0.00	0.00	0.00 0.00	8.50	<.001
Married Household	0.00	0.01	-0.02 0.02	0.12	.902	0.00	0.01	-0.02 0.02	0.08	.935
Employed Parents	-0.01	0.01	-0.02 0.00	-1.89	.059	-0.01	0.01	-0.02 0.00	-1.92	.055
Household Income	0.01	0.00	0.00 0.01	2.81	.005	0.01	0.00	0.00 0.01	2.82	.005
Financial Difficulties	-0.01	0.00	-0.01 0.00	-1.42	.156	-0.01	0.00	-0.01 0.00	-1.49	.137
Human Capital (High)	0.01	0.00	0.00 0.01	3.81	<.001	0.01	0.00	0.00 0.01	3.98	<.001
Human Capital (High) *Immigrants	-	-	- -	-	-	-0.02	0.01	-0.04 0.00	-1.90	.058

b= Regression Coefficient; SE= Standard Error; CI= Confidence Interval

Multivariate Analysis (Group-stratified models)

Table 4 shows the results of two linear regressions by immigration status. *Model 3* showed the protective effect of high parental human capital on the executive function of

non-immigrant adolescents. *Model 4*, however, did not show any effect of high parental human capital on adolescents' executive function for immigrants.

Table 4. Summary of linear regressions by immigration status ($n = 4,188$).

	Model 3 non-immigrants						Model 4 immigrants					
	B	SE	95%CI	t	p	B	SE	95%CI	t	p		
Sex (Male)	0.00	0.01	-0.01	0.01	0.05	.961	0.00	0.04	-0.08	0.08	-0.02	.988
Age (Months)	0.00	0.00	0.00	0.00	8.33	<.001	0.00	0.00	0.00	0.01	1.84	.074
Married household	0.00	0.01	-0.02	0.02	0.11	.916	-0.04	0.07	-0.19	0.11	-0.57	.569
Employed Parents	-0.01	0.01	-0.02	0.00	-1.90	.057	-0.01	0.04	-0.09	0.08	-0.13	.900
Household Income	0.01	0.00	0.00	0.01	2.87	.004	-0.01	0.02	-0.04	0.03	-0.37	.715
Financial Difficulties	-0.01	0.00	-0.01	0.00	-1.44	.149	-0.03	0.03	-0.10	0.04	-0.92	.365
Human Capital (High)	0.01	0.00	0.00	0.01	3.91	<.001	-0.01	0.01	-0.04	0.01	-1.16	.254

b= Regression Coefficient; SE= Standard Error; CI= Confidence Interval

Discussion

Overall, high parental human capital was associated with a higher task-based executive function of adolescents. However, the boosting effect of high parental human capital on adolescents' executive function is diminished for immigrant families compared to non-immigrant families. The magnitude of the difference is significant.

The observed diminished return of the human capital of the parents on the executive function for immigrant than non-immigrant adolescents is similar to the previous research on MDRs^{60,65,99,100}. MDRs are well established within individuals, with families, and within generations. These MDRs hold across SEP resources, age groups, outcomes, and marginalizing identities^{51,52}. Recent research has documented MDRs based on immigration⁵⁵. That means, if an individual or a family is immigrant, their SEP indicators in general and high human capital, in particular, will have a weaker effect on their health outcomes, when compared to the same process in non-immigrants⁵⁵.

MDRs research has focused primarily on and shown diminished returns of ethnic and racial minorities rather than immigrants. MDRs have been previously been documented for Blacks, Hispanics, Asian Americans, Native Americans, and to a lesser extent immigrants and LGBTQ individuals. These MDRs hold for human capital of the parents^{54,55,63} as well as income⁵⁴, education⁶⁵, employment¹⁰⁶, and marital status⁶¹. Human capital and family SEP generate less

health for adolescents^{54,55,63}, adults⁶⁰, and older adults¹⁰⁷.

Various mechanisms may be involved in explaining the MDRs of family SEP or immigrant families. Immigrant families face disproportionately higher levels of stigma, stress, trauma, and financial difficulties in their daily lives, across all SEP levels. According to the social reproduction theory, human capital differently generates outcomes in social groups¹⁰⁸. In the US, upward social mobility is not similarly easy for all social groups¹⁰⁹.

Increased exposure to stress is believed to reduce adolescents' ability to gain from their available family SEP resources such as parental education and income. It is shown that an increase in SEP for immigrant families means an increase in experiences of¹¹⁰⁻¹¹⁴ and vulnerability⁸¹ to discrimination. This might be because high SEP immigrant families are more likely to be surrounded by non-immigrant families, which means a higher level of exposure to discrimination^{110,111}. Needless to say, high levels of discrimination means undesired outcomes and reduced gains of SEP^{81,113,115}.

Many immigrants live in ethnic enclaves. Residential segregation results in diminished returns of human capital in immigrant communities. Due to segregation, school options are limited for high SEP immigrant families. As a result, children of high SEP immigrant families attend highly segregated schools with low resources¹¹⁶⁻¹¹⁸. That means the differential effect of SEP on education and schooling of non-immigrants and immigrants.

<http://journals.ke-i.org/index.php/mra>

While high SEP non-immigrant adolescents attend schools in suburban areas with more funding and higher-quality teachers, immigrants may need to attend schools that are of lesser quality²⁹.

Immigration did not have the main effect on adolescents' executive function. They even had higher human capita but lower-income and more financial difficulties. These are all indicators of structural inequalities, which, in itself, are indicators of a less-commonly discussed type of disadvantage. Most of the existing discussion on inequalities is focused on another class of disadvantage, which is the low SEP of the marginalized group^{51,52}. However, this study shows that not all inequalities are due to the gap across the groups in terms of SEP resources. Due to MDRs, adolescents show worse than expected outcomes despite their access to SEP.

We argue that given MDRs exist, researchers and policymakers should not only address inequality in SEP, but they should also address inequality in the returns of SEP. Immigrants are at a disadvantage because their SEP shows low levels of return and their increasing SEP resources would generate in less than expected effects for them^{51,119}. This should not discourage us from investing in them. Instead of merely focusing on SEP, we should focus on inequalities that have emerged across all SEP levels.

Multilevel economic, psychological, and societal mechanisms may be involved in explaining racial and ethnic gaps in the returns of parental education^{51,119}. MDRs may be due to racism across multiple societal institutions and social structures^{51,119}. Xenophobia, racism, prejudice, and discrimination interferes with the processes that are needed to gain benefits from available SEP resources¹²⁰⁻¹²². MDRs of family SEP may be in part due to a history of childhood poverty¹²³.

Marginalized families (e.g. immigrants) are more likely to stay in poor neighborhoods despite attaining high SEP. Marginalized

families are more likely to stay poor than non-immigrants^{59,124}. Similarly, immigrant families from high SEP backgrounds may remain at risk of environmental exposures than non-immigrants with similar SEP^{110,111,113,125-129}. Similarly, adolescents from high SEP but still marginalized families are more likely to spend time with peers with higher risk and behavioral problems. This risk is not high for high SEP families that are not marginalized^{53,104}.

Implications of the current findings on the existing MDRs are that societal inequalities are not merely a result of unequal access to SEP, but also unequal processes that alter the degree to which the same SEP can result in differential outcomes for groups. As a result, the unfair processes of society should be addressed to achieve equality and equity. Interventions should target the very societal, social, environmental, and structural processes that cause MDRs for marginalized people. We argue that the solution to the inequalities is both enhancing SEP and also eliminating MDRs-related disparities. It is important to develop, design, implement, and evaluate policies that belong to each class. At the same time as the solution to disparities due to the gap in SEP is to increase immigrants' access to SEP resources, the remedy to MDRs-related inequalities is to empower immigrants so they can more efficiently translate their SEP to outcomes. The latter solution requires policies and programs that go beyond access and address structural and environmental factors. For the latter, there is a need to equalize the life conditions of immigrants and non-immigrants.

The findings reported here are important in several ways. First, diminished returns are real, however, they are seldom a focus of policymakers. That means a common assumption by policymakers is that if we can eliminate socioeconomic gap, we would be able to eliminate inequalities as a result. This assumption, however, does not have a scientific basis. In fact, in many cases, our policy interventions result in a larger change

in the Haves than the Have-Nots, thus our interventions may inadvertently widen the existing gaps. Second, this is particularly important because the solution to MDRs is different from the solution to inequalities that are due to a lack of resources. To minimize MDRs-related inequalities, merely increasing access to resources would not be enough. Instead, policy solutions should focus on the societal barriers and sources of marginalization of the populations. Third, Australia, US, and Europe are all experiencing some crisis regarding the political aspects of immigration. Immigration has become very political, and immigration policies have become a source of conflict in many countries. Similarly, immigrants are facing more structural, institutional, and interpersonal discrimination. As such, the results may be relevant to many countries where immigrants are experiencing systemic inequalities.

Limitations

As our data were cross-sectional, we can not draw causal links between immigration status, parental human capital (SEP), and adolescents' executive function. This study only tested the MDRs of parental human capital. Other SEP indicators such as income, wealth, employment, and neighborhood SEP may also show MDRs. Finally, this study only described the existing MDRs without exploring the contextual mechanisms and factors that explain the observed MDRs.

Conclusion

Compared to non-immigrant adolescents, immigrant adolescents show lower task-based executive function across all parental human capital levels. This is mainly because their high parental education does not enhance their executive function. As such, immigrant adolescents' executive function remains low even when they have high parental human capital. This weaker association between parental human capital and adolescents'

executive function in immigrants than non-immigrants is systematically ignored in the political discussion that is needed to achieve health and economic equity. As a result of this relative disadvantage, immigrant adolescents show poor educational outcomes despite their high SEP families. It is still unknown why high-SEP immigrant adolescents remain at risk. There is a need to conduct more research on this topic.

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