# Is More Always Better?

## The Relation Between Socioeconomic Status and Human Development

by

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ABSTRACT

Socioeconomic status (SES) is one of the most well researched constructs in developmental science, yet important questions underly how to best model it. That is, are relations with SES always in the same direction or does the direction of association change at different levels of SES?

In this dissertation, I conducted a meta-analysis using individual participant data (IPD) to examine two questions: 1) Does a nonmonotonic (quadratic) model of the relations between components of SES (i.e., income, years of education, occupation status/prestige), depressive symptoms, and academic achievement fit better than a monotonic (linear) model? and 2) Is the magnitude of relation moderated by developmental period, gender/sex, or race/ethnicity? I hypothesized that there would be more support for the nonmonotonic model. Moderation analyses were exploratory.

I identified nationally representative IPD from the Inter-university Consortium for Political and Social Research (ICPSR). I included 59 datasets, which represent 23 studies (e.g., Add Health) and 1,844,577 participants. Higher income ($\beta$ = -0.11; $\beta$ = 0.10), years of education ($\beta$ = -0.09; $\beta$ = 0.13), and occupational status ($\beta$ = -0.04; $\beta$ = 0.04) and prestige ($\beta$ = -0.03; $\beta$ = 0.04) were associated with a linear decrease in depressive symptoms and increase in academic achievement, respectively. Higher income ($\beta$ = 0.05), years of education ($\beta$ = 0.02), and occupational status/prestige ($\beta$ = 0.02) were quadratically associated with a decrease in depressive symptoms followed by a slight increase at higher levels of income and a diminishing association towards higher levels of education and occupational status/prestige. Higher income was also quadratically associated with academic achievement ($\beta$ = -0.03). I found evidence that these

associations varied between developmental periods and racial/ethnic samples, but I did not find evidence of variation between females and males.

I integrate these findings with three conclusions: (1) more is not always better and (2) there are unique contexts and resources associated with different levels of SES that (3) operate in a dynamic fashion with other cultural systems (e.g., racism), which affect the integrated actions between the individual and context. I outline several measurement implications and limitations for future research directions.

I dedicate this dissertation to my wife and life partner, Erin Hardy.

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TABLE OF CONTENTS

Page

LIST OF TABLES ..... ix

LIST OF FIGURES ..... x

CHAPTER

1 INTRODUCTION ..... 1

Overview ..... 1

Statement of the Problem ..... 3

Contribution ..... 4

2 SES AND HUMAN DEVELOPMENT ..... 6

Operational Definitions of SES ..... 8

SES and Development ..... 19

SES and Culture ..... 23

SES, Culture, and Development ..... 27

More is Always Better ..... 32

Better is Somewhere in the Middle ..... 35

Developmental Period and SES ..... 39

Gender/Sex and SES ..... 42

Race/Ethnicity and SES ..... 44

Summary ..... 46

3 A META-ANALYSIS OF INDIVIDUAL PARTICIPANT DATA ..... 48

Meta-Analysis ..... 48

CHAPTER Page

Individual Participant Data (IPD) ..... 49

Research Question #1 ..... 51

Research Question #2 ..... 51

4 METHOD ..... 52

Identifying Studies ..... 52

Inclusion and Exclusion Criteria ..... 52

Data Items – Participant Level ..... 54

Data Items – Study Level ..... 57

Analysis Plan ..... 58

5 RESULTS ..... 69

Study Selection and IPD Obtained ..... 69

Descriptive Characteristics ..... 69

Preliminary Analyses ..... 74

Research Question #1 ..... 77

Research Question #2 ..... 80

6 DISCUSSION ..... 87

Sometimes Better is Somewhere in the Middle ..... 89

Developmental Period as a Defining Feature of the Contexts Associated with SES ..... 102

Race/Ethnicity as a Defining Feature of the Contexts Associated with SES 108

Measurement Implications ..... 121

CHAPTER Page

Limitations for Future Research Directions ..... 125

Conclusion ..... 129

REFERENCES ..... 132

APPENDIX

A TABLES AND FIGURES ..... 164

LIST OF TABLES

Table Page

1. Summary Characteristics of Each ICPSR Dataset (59) Identified for Inclusion .....165
2. Number of Extracted Correlation Matrices By Developmental Period, Sex, and Race/Ethnicity.....175
3. Summary of Extracted Correlations.....176
4. Example of a Square Correlation Matrix Based on Wave 1 (1995) of Add Health for Black, Adolescent Males.....180
5. Number of Extracted Correlations Included in Model 1 and/or Model 2 for Each Cell.....181
6. Model 1 Implied Correlations and $\hat{\tau}^2$.....182
7. Model 1 Parameter Estimates.....183
8. Model 2 Implied Correlations and $\hat{\tau}^2$.....184
9. Model 2 Parameter Estimates.....185
10. Moderation of Parameter Estimates by Developmental Period.....186
11. Moderation of Parameter Estimates by Sex.....187
12. Model 2 Parameters for Depressive Symptoms Separated by Race/Ethnicity....188
13. Model 2 Parameters for Academic Achievement Separated by Race/Ethnicity..189

LIST OF FIGURES

Figure Page

1. Conceptual Model Linking Socioeconomic Status to Human Development.....190
2. Conceptual Depiction of the A) More is Always Better (i.e., Monotonic, Linear) and B) Better is Somewhere in the Middle (i.e., Nonmonotonic, Quadratic) Model of Socioeconomic Status.....191
3. Model 1 (Monotonic; More is Always Better) and Model 2 (Nonmonotonic; Better is Somewhere in the Middle) Represented in Path Diagrams.....192
4. Flow Diagram of the Inclusion and Exclusion Process.....193
5. Histogram Plots for Correlations Between Focal Variables.....194
6. Parameter Estimates for Model 1 and Model 2 Represented in Path Models.....195
7. Depiction of the Quadratic Patterns of Association with Depressive Symptoms for Income, Years of Education, and Occupational Status and Prestige Across All Samples.....196
8. Depiction of the Quadratic Pattern of Association Between Income and Academic Achievement Across All Samples.....197
9. Depiction of the Quadratic Patterns of Association with Depressive Symptoms for Income, Years of Education, and Occupational Status Disaggregated by Developmental Period.....198
10. Depiction of the Quadratic Patterns of Association with Depressive Symptoms for Income, Years of Education, and Occupational Status Disaggregated by Race/Ethnicity.....199

Figure Page

11. Depiction of the Quadratic Pattern of Association Between Income and Academic Achievement among White Sample.....200

CHAPTER 1

# Introduction

## Overview

A family's educational history, what they do for work, and their financial assets meaningfully shape a child's behavior, health, and success in adulthood (Bradley & Corwyn, 2002; Coleman et al., 1966; Kraus et al., 2011; McLoyd, 1998; Williams, 1990). In societies where people are stratified based on their social status, such as class standing, the aforementioned indicators typically define a child's physical environment, the people and places they interact with, and the basic life necessities, resources, and opportunities afforded to them (Causadias, 2020; Fiske, 2010; Ridgeway & Fiske, 2012). For instance, families with higher income/wealth, more education, and high profile jobs often live in spacious homes located in safe neighborhoods near schools with more funding whereas family's with lower income/wealth, less education, and laborious jobs often live in crowded homes located in disadvantaged neighborhoods (e.g., greater violence, pollution) near schools with less funding (Evans, 2004). The impact of this ecological conglomerate on an individual's development across the lifespan has been captured in prior research through studies on socioeconomic status (SES), which is frequently represented by income, education, and/or occupation status and prestige. Given the valuable impact of SES, it is crucial for developmental scientists, and social scientists alike, to advance understanding SES and its role in human development, including its underlying meaning and how it is modeled in research studies.

Although researchers have amassed a body of evidence on the connection between SES and development, the nature of the components that form it has received less attention. As a result, operational definitions across studies have been less consistent, which has led to variability in how it has been measured and the knowledge produced (Diemer et al., 2013; Loignon & Woehr, 2018). This is especially problematic for developmental psychologists who seek to invest public funds and valuable time in elucidating the specific mechanisms linking SES to important longitudinal trajectories of mental health and success (Korous et al., 2021). Decision makers, therefore, are left without precise and compelling evidence on what aspects of SES to target in interventions and policies.

The scholarly debate on operationalizing SES has primarily centered on what components to include and how to best model them (Bradley, 2016; Ensminger & Fothergill, 2003; Krieger et al., 1997). For instance, although income, education, and occupational status/prestige are the commonly used components to represent SES, there is question whether research studies should examine associations with specific components or use a combination of these components to form an aggregate or latent variable (Korous et al., 2018, 2021). Most investigations within this debate have emphasized monotonic relations; that is, the sign of the association between SES and a particular developmental outcome remains the same (i.e., positive or negative) across the range of the SES gradient. It is often the case that researchers estimate linear associations with SES such that each increase in SES is associated with better health (positive sign; e.g., Adler et al., 1994) and fewer depressive symptoms (negative sign; e.g., Lorant et al., 2003). Overlooked in this discussion is the fact that the relation between SES and human

development can also be nonmonotonic for some outcomes meaning that the direction of its association may change from positive to negative at a specific region (or threshold) of the SES gradient. These different patterns of association (e.g., linear versus quadratic) for each component of SES have not been extensively researched.

**Statement of the Problem**

Given the sparse research on the nonmonotonicity of SES and development, researchers and practitioners are left with an important question. That is, are developmental relations with components of SES always in the same direction (i.e., monotonic) or does the direction of relation change at different levels of SES (i.e., nonmonotonic)? This question challenges the assumption that more is always better: more income, more education, more prestige, and more resources. A more is always better approach to SES reinforces a deficit model, which emphasizes the deficiencies and limitations of individuals and families from lower SES backgrounds (M. Cole & Bruner, 1971; García Coll et al., 1996); and beliefs in meritocracy that enforce individualism and attribute failure to a lack of effort and talent (Bullock & Lott, 2010). Deficit modeling and justifying meritocracy ignore the structural and interpersonal dynamics that contribute to economic inequality (Kraus & Park, 2017; Piff et al., 2018).

A more is always better approach to SES also overlooks the potential costs associated with higher SES (Luthar, Kumar, et al., 2020). Although a body of knowledge has generated evidence of the negative health and achievement consequences of lower SES (e.g., Bradley & Corwyn, 2002; Korous et al., 2018, 2021), and how to implement interventions to address these consequences (e.g., Duncan et al., 2017; Stephens, Hamedani, et al., 2014), less evidence and interventions exists for addressing higher SES.

This oversight is problematic, because accumulating evidence shows that youth at both ends of the distribution have a higher likelihood of substance use and suicide (National Academies of Sciences, Engineering, and Medicine, 2019a, 2019b). That is, the direction of relation between SES and human development may be positive or negative for certain outcomes depending on the level of SES. Examining the potential risks associated with higher SES will complement the wealth of existing evidence, improve outcomes for all at-risk youth, and potentially identify novel and impactful methods for addressing inequality.

**Contribution**

Examining the patterns of association with SES (i.e., monotonic versus nonmonotonic) will advance theory of its role in human development. Conventionally, researchers have broadly defined SES as access to resources (e.g.., financial, social; Cowan et al., 2012). However, if the direction of association changes at a particular threshold of the SES gradient, then what aspects of the contexts associated with SES (e.g., type of stressor) account for the change in the positive and/or negative direction? That is, what processes increase the likelihood of developing depressive symptoms for individuals from lower and higher SES backgrounds, relative to SES backgrounds somewhere in the middle, despite interacting with distinct physical, social, and cultural contexts?

The aim of my dissertation is to compare a monotonic versus nonmonotonic model of SES. In Chapter 2, I review traditional social class theories that inform operational definitions of SES and arrive at the following definition: SES is a relative ranking within a sample or population based on social and economic cultural symbols

that signal prestige and correlate with power and access to resources. Then, I review the theoretical background and empirical evidence linking SES to human development, as well as the role of culture. I draw from bioecological systems theory (Bronfenbrenner & Morris, 2006) and developmental psychopathology (Cicchetti, 2006) to inform my theorizing. I outline that, as a form of culture, SES can be examined as a promotive factor, leading to adaptive trajectories such as academic achievement, and risk factor, leading to developmental deviations such as depressive symptoms (Causadias, 2013). Afterwards, I introduce to competing models underlying research on SES, which I label as *more is always better* and *better is somewhere in the middle*. I also discuss the extent to which these models manifest across different developmental periods, females and males, and racial/ethnic populations. In Chapter 3, I introduce the study including the use of individual participant data (IPD) in meta-analysis and the two research questions. In Chapter 4, I describe the method of the study, which was preregistered on Open Science Framework (OSF) before any data analysis (see osf.io/92vk4). In Chapter 5, I report all my findings as they relate to each research question. Finally, in Chapter 6, I summarize the findings and discuss the broader implications for theory, research, practitioners, and policy makers, as well as some limitations for future research directions.

CHAPTER 2

## SES and Human Development

It is widely acknowledged by scholars from various disciplines that SES, or social class more broadly, is a major determinant in youths' development across the lifespan. First, SES is a primary contributor to health disparities, especially in conjunction with racism (Adler, 2009; Adler & Newman, 2002; Williams et al., 2010). For instance, amid the COVID-19 health pandemic Americans from low SES backgrounds were more likely to be physically and economically impacted (Los Angeles County Department of Public Health, Chief Science Office, 2020; Rollston & Galea, 2020). Second, there is a historical and persistent gap in academic achievement between youth from low and high SES backgrounds (Chmielewski, 2019; Hanushek et al., 2020). In fact, the correlation between parental education and educational attainment in adulthood is nearly as large as the association between intelligence and educational attainment (Strenze, 2007). Third, SES is correlated with a range of mental health and behavior problems. For instance, lower SES is associated with greater depressive symptoms and risk of suicide (Franklin et al., 2017; Korous et al., 2018), which has increased over the years for higher SES as well (Luthar, Kumar, et al., 2020; Twenge et al., 2019).

Despite the ample body of knowledge on SES and human development, several limitations inherent in this literature hinder the formulation of effective interventions and policies including (a) the various approaches (e.g., measuring income, education, or some combination of the two) and levels (e.g., individual, household, neighborhood) that are applied to define and measure SES across studies (Diemer et al., 2013), and (b) the overlapping contexts (e.g., family structure, neighborhoods, school) that are correlated

with SES (Huston & Bentley, 2010; Krieger et al., 1997). Decisions on the aforementioned limitations are likely driven by the discipline of researchers and their theoretical approach to understanding SES and its link with development. An additional limitation that has received far less attention in the literature is how these components of SES are modeled in relation to certain developmental outcomes.

How researchers model SES in a study has important implications on their findings, interpretations, and, ultimately, developmental theory. An underlying assumption of SES research is that higher income, more years of education, or higher occupational status/prestige is beneficial for optimal development including better physical health outcomes, increased well-being, and greater achievement (Adler et al., 1994; Korous et al., 2021; Reardon, 2011; Tan et al., 2020). Although this approach has generated evidence for supporting policies for families living in poverty (e.g., National Academies of Sciences, Engineering, and Medicine, 2019a), this narrative pathologizes lower SES; youth from lower SES backgrounds are "in trouble" whereas youth from higher SES backgrounds have it "put together". On the other hand, a less mainstream perspective addresses the complexity of SES by acknowledging the precarious livelihood of youth from the lowest and highest ends of the distribution (Bradley, 2016; Luthar, Kumar, et al., 2020; National Academies of Sciences, Engineering, and Medicine, 2019b). These competing approaches to modeling SES impact the knowledge produced on which levels of SES lead to positive or negative developmental outcomes, which informs theoretical understanding of the role of SES in human development.

The purpose of this chapter is to advance the scholarly discussion on the association between SES and human development. I begin by reviewing operational

definitions of SES, in terms of what the construct intends to signify and how it is measured. Then, I highlight both theory and research that link SES to important developmental outcomes. Afterwards, I introduce two competing models of SES that are applied in research designs and interpretations: *more is always better* and *better is somewhere in the middle*. I argue that the latter model is needed to advance understanding of SES and human development in conjunction with developmental period, gender/sex, and race/ethnicity.

**Operational Definitions of SES**

It is commonly accepted in the social sciences that there is no established operational definition of SES. For decades, scholars have attended to issues related to clarifying and refining definitions of SES and how to best measure it, albeit, less attention compared to explanations linking SES to particular outcomes (Oakes & Rossi, 2003). In turn, researchers across disciplines have operationalized SES in some variation: general psychology (Diemer et al., 2013), social psychology (Bullock & Lott, 2010; Kraus et al., 2012), cultural psychology (A. B. Cohen, 2009; Stephens, Markus, et al., 2014), educational psychology (Cowan et al., 2012; Harwell, 2018), developmental psychology (Bradley, 2016; Mueller & Parcel, 1981), family sciences (T. E. Smith & Graham, 1995), public health (Adler & Rehkopf, 2008; Krieger et al., 1997), epidemiology (Liberatos et al., 1988; Lynch & Kaplan, 2000), sociology (Pampel et al., 2010; Williams & Collins, 1995) and organizational sciences (Loignon & Woehr, 2018). Nonetheless, a standard definition of SES may be unnecessary and impractical given diverse theoretical foundations and pathways linking its operationalization to specific outcomes. Therefore, it is important that future operationalizations of SES are framed within theory.

Operational definitions of SES are traditionally rooted in theories of social class stratification. Stratification, in general, is the practice of assigning rank (status) based on socially defined categories, which correlates with access to resources (power; Fiske, 2010). Class is one social category applied to rank people, but analyses of class boundaries vary by theoretical approaches. For instance, explanations regarding the origins of class stratification depend on perspectives such as the conflict view, functionalist view, and market view (T. E. Smith & Graham, 1995). Likewise, some theories on the dimensions of class focus on the economic market, as a form of status and/or power, whereas others focus on indicators that increase life chances and capital (Wright, 2002b). SES is connected to social class stratification because it is constructed by the indicators associated with class-specific positions (e.g., income). As a result, operationalizations of SES include components of social class position, status/prestige, or both (Bradley & Corwyn, 2002). Despite the implications of social class theories on operational definitions of SES, they are not explicitly stated in developmental research (Ensminger & Fothergill, 2003; Harwell, 2018; T. E. Smith & Graham, 1995). For this reason, it would be informative to review how traditional social class theories impact operational definitions of SES in order to arrive at an operationalization rooted in theory.

An operational definition of SES developed from a Marxist approach to stratification would center on the economic system and the social relationships within it. (Marx, 1887) posited two colliding social classes: (1) those who control production (capitalists) and (2) those exploited by the producers (laborers). Others have extended Marx's interpretation to include additional classes (e.g., middle-class; Wright, 1985). In turn, the Marxist tradition theorizes broad categories of class based on occupation

because occupations are a marker of an individual's position relative to production and degree of power (Lynch & Kaplan, 2000; Wright, 2002a). The Marxist view also contributes to understanding the structural conditions of SES including the distribution of resources and limitations of economic activity (Krieger et al., 1997; Wright, 2002a). For example, an accumulation of resources for some (higher SES) leads to a lack of resources for others (lower SES), who also have constrained choices for acquiring income and investing in the future. Therefore, from this tradition, individual effort is not sufficient for upward mobility. Despite the potential usefulness of a Marxist view, its underutilization in operational definitions of SES is likely due to its unidimensional focus on the market economy (T. E. Smith & Graham, 1995).

A Weberian view of class is perhaps the most commonly applied stratification theory to operationalize SES given its multidimensionality. The Weberian tradition emphasizes an individual's life chances, or their opportunities for obtaining necessities and valued goods (Breen, 2002). Those who share similar life chances are categorized in the same class-situation (Weber, 1946). Weber (1946) proposed that an individual's life chances are indicated by three dimensions, including their economic order (class), social privilege (power), and social honor within their community (status or prestige). Operational definitions of SES within this framework include components that are related to an individual's life chances (Lynch & Kaplan, 2000). In effect, income, educational attainment, and occupational status/prestige are the most common components applied to define SES because they map onto one or more of the economic, power, or status dimensions (Liberatos et al., 1988; T. E. Smith & Graham, 1995). However, these three components of SES are also connected to the idea of capital.

Some operationalizations of SES reference the concept of capital (Bradley & Corwyn, 2002; Entwisle & Astone, 1994; Harwell, 2018). Coleman (1988) described a family's background (i.e., SES) as made up of three different components of capital that distinguish resources and opportunities: social capital, financial capital, and human capital. A form of capital gives rise to powers and/or resources that would not be feasible without that specific capital, that is, through networks of relationships (social capital), economic material (financial capital), or acquired skills and capabilities (human capital; Coleman, 1988). Income, educational attainment, and occupational status/prestige have been linked to broader definitions of SES because they are related to Coleman's three forms of capital (Bradley, 2016; Cowan et al., 2012; Oakes & Rossi, 2003). Bourdieu (1986) also defined similar forms of capital such as economic and social capital. The distribution of these forms of capital, when accumulated, were considered important factors for determining social locations in a class system (Bourdieu, 1987; Weininger, 2002). One of the features that separated the two theorists was Bourdieu's inclusion of cultural capital, which introduced a symbolic dimension to social class stratification.

Culture is an inherent theme in theories of social class stratification. Bourdieu's introduction of the symbolic dimension of status, in addition to the traditional economic dimension, called attention to the powers and resources derived from obtaining competencies and goods valued in specific cultures (i.e., cultural capital; Weininger, 2002). Bourdieu (1986) defined three states of cultural capital that represented individual dispositions and abilities (embodied capital; e.g., language), cultural products (objectified capital; e.g., pictures, books, cars), and qualifications (institutionalized capital; e.g., formal education). He posited that these states of cultural capital hold value in society,

relative to others, because they can potentially be exchanged for monetary gain (economic capital; Bourdieu, 1986). Weber (1946) also incorporated culture in his interpretation of prestige, which emphasized social honor – and the privilege attributed to it – within a specific community. Weber outlined that certain behaviors and rituals maintain status distinctions and monopolize resources. Overall, these theories have contributed to operationalizing SES as a cultural system.

An operational definition of SES needs to be rooted in a cultural framework. This is not a novel proposition because social class theories, in which SES is constructed from, have historically highlighted the importance of culture, as discussed above. However, this argument is worth emphasizing because culture is a fundamental aspect of human development (Causadias & Cicchetti, 2018). Culture, from a general viewpoint, can be defined as a shared set of values and behaviors that are transmitted across generations (Causadias et al., 2017), but can also be defined more specifically as a system of people, places, and practices (Causadias, 2020). Similarly, SES can also be defined as a system of people, places, and practices.

Class is a social category and the ranking of people (status) is what characterizes SES, as well as social class, because an individual's position is relative to another based on population dynamics and social relationships. For instance, theories of social class have focused on class as a product of social relationships (Marx, 1887) and on group differences in relation to life-chances (Weber, 1946) and accumulation of capital (Bourdieu, 1986). In addition, the level of power or prestige attributed to a particular level of SES depends on the values shared among people, that is, observable materials and resources can signal one's social class (Kraus et al., 2011). SES is also defined by

places because it is correlated with specific contexts and social structures that determine access to resources, social networks, and behavioral expressions (Huston & Bentley, 2010; Kraus & Park, 2017). Additionally, theories of social class stratification have focused on the market economy as a place for exchange and production (Marx, 1887), community as a place for honor (Weber, 1946), and educational institutions as a place for qualifications (Bourdieu, 1986). Finally, there are SES-specific practices. Traditional theories have highlighted practices through, for example, class conflict (Marx, 1887) and social exchange and obligation (Coleman, 1988). Backgrounds specific to particular levels of SES can influence how people think and interact (Piff et al., 2018; Stephens, Markus, et al., 2014), as well as influence cultural socialization such as developing a status-based identity (Destin et al., 2017) and learning class-based signals (Kraus et al., 2017). Furthermore, stratification is a system including power that leads to discrimination and exclusion in effort to maintain status hierarchies (Fiske, 2010).

Power is central to a cultural system of people (power-over people), places (power-in places), and practices (power-to practice; Causadias, 2020) and, for this reason, power is a key feature of operational definitions of SES. Power, from a stratification perspective, affords control over physical (e.g., places), financial (e.g., practices), and social resources (e.g., people), which is often corelated with status (Fiske, 2010). In other words, higher SES is frequently related to more power because it is associated with access to desired resources. This is consistent with past operational definitions of SES, defined as the unequal distribution of resources (Oakes & Rossi, 2003). Power is also consistent with social class stratification theories because control over some sort of resource(s) is a defining feature. For instance, operational definitions derived from

Bourdieu's (1986) forms of capital imply that people with higher SES have more control over social, financial, and cultural capital, and operational definitions derived from Marxist approach imply that producers exploit laborers (Wright, 2002a).

Evidence of power is exemplified by income inequality in the United States (McCall & Percheski, 2010). For example, in 2018 the top 10% income earners had, on average, ten times more income than the bottom 90% income earners while the top 0.1% had, on average, almost 200 times more income than the bottom 90% (Inequality.org, 2020). Associated with levels of income inequality, evidence of power is also illustrated by the limited intergenerational mobility; children from lower SES backgrounds have less opportunity for upward mobility (Corak, 2013). In fact, income inequality can decrease beliefs of upward mobility among people from low SES backgrounds, which corresponds with lower likelihood of behaviors that are related to socioeconomic success (Browman et al., 2019). This lack of upward mobility is an example of classism, which is a manifestation of power that structurally prevents accessing resources that can increase social mobility (Lott, 2012). In effect, as it is worth repeating, individual effort or merit is not sufficient for significantly improving SES. This proposition contradicts the idea of the American Dream, or the promise of meritocracy; a system-justifying ideology that hard work and individual merit is rewarded equally and translates into success (McNamee & Miller, 2009). Instead, there is power over people, in places, and for practices that reproduce SES distinctions and maintain inequality.

Power also contributes to advancing operational definitions of SES because it acknowledges other cultural systems that intersect with classism and change the meaning of SES, namely, racism. Racism is a cultural system that is historically rooted in an

ideology of superiority among group members with power and privilege over other group members considered inferior or deviant (Harrell, 2000). Because of racism, racial/ethnic minority Americans are excluded from status and resources. For example, Black Americans in United States are not afforded the same status as White Americans, despite the public belief of increasing racial economic equality (Kraus et al., 2019). To illustrate, in 2016, the median income of White households was nearly 50% greater than the median income of Black households while the median wealth of Black households was 12% of the median wealth of White households (Kuhn et al., 2018) This wealth gap is not attributed to educational achievement as the median wealth of Black households with a college degree is lower than the median wealth of White households with only a high school diploma (Darity Jr et al., 2018). Overall, by incorporating a cultural perspective in operationalizations of SES it becomes clear that the level of prestige attributed to indicators of status, and their associated resources, are unequally distributed across populations.

Cultural capital is one example of how operationalizations of SES have been extended using a cultural lens centered on power. Recall that Bourdieu (1986) posited that cultural capital was accumulated over time and could be exchanged for economic capital. He defined this cultural capital as a standard set of skills, abilities, and goods valued in society. However, this framing neglected the manifestation of power in determining which skills and abilities were valued and available to be exchanged. In other words, Bourdieu's interpretation of cultural capital focused on the skills and abilities valued by groups with power (Yosso, 2005). In turn, Bourdieu's interpretation implied that some people were culturally-deficient because they did not possess the type

of cultural capital considered to be prestigious. Using critical race theory, Yosso (2005) extended this concept to represent six additional forms capital (i.e., cultural wealth) that serve as resources and assets for navigating and resisting a racist cultural system. This extension of cultural capital acknowledges the role of power in the different forms of resources connected to operational definitions of SES.

Overall, social class stratification theories and cultural perspectives give rise to varying operational definitions of SES. In some cases, SES and social class are used interchangeably. However, SES and social class are distinct constructs because their operationalizations, measures, and causal mechanisms vary (Krieger et al., 1997; Wohlfarth, 1997), and social class is better understood within class analysis and theory (Williams, 1990). For example, a Weberian approach distinguishes between class and status (Weber, 1946). Also, the same occupational title can receive the same prestige score, but different class categories (Wohlfarth, 1997). Furthermore, socioeconomic position has also been defined in the literature as a similar, yet different construct than SES (Krieger et al., 1997; Lynch & Kaplan, 2000). Krieger and colleagues (1997) argued for the use of socioeconomic position, instead of SES, to more clearly delineate between actual resources and status because SES does not conceptually make this distinction. In contrast, other scholars have defined SES more broadly as an index of position (Diemer et al., 2013) or access to resources (Bradley, 2016). Nonetheless, the proposed distinction between *position* and *status* is not clearly conceptualized at this time.

Although operationalizations of SES vary, researchers generally rely on the three common components to measure it: income, educational attainment, and occupational status/prestige (Diemer et al., 2013; Ensminger & Fothergill, 2003). Across theoretical

approaches, these components either represent a form of capital or increase life chances and opportunities to access resources. Despite their acceptance, researchers analyze them differently; some researchers compute composite scores or latent variables (Harwell, 2018; Oakes & Rossi, 2003) whereas other researchers recommend examining each component separately (Braveman et al., 2005; Geyer et al., 2006; Korous et al., 2018). An issue in addressing this analytical decision is related to the association between components. It is unclear whether individual components interact to form SES or whether they have simpler additive effects. Also, occupational status scores are derived from a combination of income and educational attainment (Nam & Boyd, 2004). From this conceptualization, higher educational attainment is a qualification for higher status occupations, which have greater monetary rewards. However, this is not always the case as components of SES can be inconsistent (e.g., higher education, lower income); levels of SES in the middle range are more likely to show these patterns (Nam & Powers, 1965).

SES is also measured across different levels and using objective and subjective approaches. First, researchers can measure SES at the level of the individual or household, neighborhood, or country (Leventhal et al., 2015; Shavers, 2007). Importantly, this level of measurement can impact findings as studies have shown that area level indicators of SES, such as neighborhoods and schools, have different effects compared to household measures (Coley, Spielvogel, et al., 2018). Second, although researchers have commonly used objective components to measure SES (e.g., income, education), subjective measures of status can also be informative (Tan et al., 2020). Subjective status is assessed using self-reports of class identity (Dietze & Knowles, 2016)

or by asking people to socioeconomically rank themselves relative to others (Adler et al., 2000). Prior research suggests that objective and subjective indicators have specific and unique associations with health and achievement, leading researchers to conclude that they exert distinct effects on development (Cundiff & Matthews, 2017; Tan et al., 2020).

Taken altogether – the variability in operationalizing SES, theoretical contributions, and analytical complexities – I define SES as a relative ranking within a sample or population based on social and economic cultural symbols that signal prestige and correlate with power. In other words, a level of SES for a given individual represents how that individual is rank-ordered when compared to other people in a given sample. This definition is consistent with studies that do not apply a predefined SES index score (e.g., Hollingshead Four-Factor Index of Social Status; Hollingshead, 1975) and, instead, examines a range of SES values in a sample (e.g., income) and its relation to a range of values for a particular outcome (e.g., achievement).

Implied in my definition, as informed by stratification, this ranking is associated with access to resources and contexts. As related to Coleman's (1988) theory of capital, having more of a specific form of capital, such as financial capital (e.g., income), grants more opportunities for accessing desired materials and resources that would not be possible without that form of capital. To give an example, a resource and investment perspectives suggests that higher income (a component of SES) affords parents more freedom to invest in resources that enhance development (e.g., books; Duncan et al., 2017). As such, levels of SES are related to different home environments (e.g., physical conditions, learning stimulation; Bradley et al., 2001, 2019). This distinction between status and resource, encourages researchers to define resources, or lack thereof,

implicated in a developmental outcome and what constitutes as a cultural symbol that impacts access to these resources.

Furthermore, my definition emphasizes that the social and economic factors applied to a ranking depend on the cultural system. For instance, as previously discussed, racism disputes assumptions that rank is equally distributed across levels of SES. That is, educational attainment does not have the same return of status for Black Americans as it does for White Americans. For instance, although higher parental education increases the likelihood of upward mobility and wealth accumulation, this effect is smaller for Black, compared to White, Americans (Assari, 2018c, 2020a). Likewise, other cultural symbols may be more valued in certain populations because they help navigate stratified contexts (Yosso, 2005). In fact, D. Cohen and colleagues (2017) found that traditional components of SES (i.e., income, education, occupation) are not meaningful contributors to how Black Americans perceive their status. This emphasis encourages researchers to consider what components of SES are specifically valuable to the population of focus and their sociocultural contexts.

**SES and Development**

It is well-established that SES explains variation in developmental outcomes across multiple domains of functioning including health, cognition, behavior, and achievement (Bradley, 2018; Conroy et al., 2010; Devenish et al., 2017; Letourneau et al., 2011). Lower SES in childhood has been associated with more behavior problems (Reiss, 2013), poorer executive functioning (Lawson et al., 2018), lower physical capabilities (Birnie et al., 2011), lower achievement (Harwell et al., 2017), and higher risk of all-cause mortality (Galobardes et al., 2004). To unpack these associations, studies

have supported that contexts associated with lower SES, like poverty, deprive children and families of basic life necessities and expose them to toxic conditions that can directly erode their physical health (Bradley & Whiteside-Mansell, 1997; Duncan et al., 2017). Studies have also shown that a combination of SES components (e.g., income, education) can affect access to resources that buffer physical and mental responses to stress and family disruptions (Conger et al., 2010; Devenish et al., 2017). This wealth of evidence establishes that SES is an important contributor to human development. Novel and innovative research along this line of inquiry is aimed at identifying specific pathways to development that can be effectively targeted in interventions and policy.

Two competing hypotheses underlie theorizations connecting SES to developmental outcomes: social causation and social selection. The social causation explanation suggests that contexts associated with SES create adversity and stress that give rise to unfavorable outcomes (Dohrenwend et al., 1992). For instance, research on the family stress model of economic hardship supports that lower income triggers family stress through increased economic pressure, which negatively impacts the adult caregivers and developing youth (Conger & Donnellan, 2007). In contrast, the social selection explanation suggests that person-centered characteristics (e.g., genetics, traits) predispose individuals to certain levels of SES (Dohrenwend et al., 1992). For instance, evidence supports that genetics explain some variation in SES (Rowe & Rodgers, 1997) and that person-centered characteristics, such as aggression, are related to components of SES in adulthood (e.g., unemployment; Kokko & Pulkkinen, 2000). For the most part, prior research supports the social causation and social selection hypotheses.

Given the supporting evidence for the social and selection hypotheses, theory has incorporated a reciprocal relation between SES and specific outcomes. The interactionist perspective posits that person-centered characteristics (e.g., competence) impact SES in one generation (social selection) and, in turn, affects the next generation's developmental outcomes (social causation; Conger & Donnellan, 2007). For example, Miech and colleagues (1999) found evidence of social causation such that lower parental SES, either as a composite or as individual components (i.e., income, education, occupation), was related to more internalizing (except depressive symptoms) and externalizing symptoms among adolescents (15 years old). They also found evidence of social selection; adolescents who met diagnostic criteria for an externalizing disorder had lower educational attainment later on (e.g., attaining a degree/certificate) compared to adolescents with no diagnosis. Finally, by 21 years of age, lower educational attainment was associated with higher levels of anxiety and increased risk of conduct or antisocial personality disorder over and above SES and prior symptoms during adolescence. As another example, Deer and colleagues (2020) found that higher income during early childhood was related to better cognitive functioning in late childhood/early adolescence, which was related to academic achievement in late adolescence (e.g., getting into college). Overall, the contribution of SES to human development is part of a dynamic system, as SES affects and is affected by certain outcomes.

The bidirectionality between SES and individual characteristics is supported by developmental systems theories. Developmental systems theories are rooted in a relational metatheory, which rejects split and reductionistic approaches (e.g., biology *or* environment; Lerner, 2006). Instead, developmental systems theories propose an

integration across different levels of organization (systems) including individual (e.g., genetics), context (e.g., culture), and time (Lerner et al., 2015). Within a developmental systems theory, the integrated actions between the individual and context is the core focus of analysis (Lerner, 2006). Therefore, a primary aim of a developmental systems theory is to examine how different levels of the context influences the individual and how the individual influences those processes. A developmental systems approach contributes to understanding SES because it acknowledges the interconnectedness between the individual and context across varying levels (i.e., biological, social, psychological), times, and places (Lerner, 2002). That is, SES can affect developmental outcomes and individual characteristics can affect future SES across generations. Thus, research on SES can advance understanding of its pattern of relations by considering the complexity of associations across varying levels of SES.

Building on the interactionist model, the developmental associations of SES should be framed within theories of developmental systems (Lerner, 2002). The bioecological model of human development is particularly useful in this regard. The bioecological systems theory recognizes that the individual, as a level of organization, is embedded within larger systems (Bronfenbrenner & Evans, 2000). The main propositions of bioecological systems theory are that proximal processes – or regularly occurring interactions between the individual and aspects of the immediate external environment that get more complex over time – are the primary driver of developmental change and that these processes are affected by person characteristics, context, type of outcome, and time (Bronfenbrenner & Morris, 2006). SES can be understood in relation to a context because different levels are associated with distinct conditions external to the individual

that can have reciprocal effects (Huston & Bentley, 2010). In turn, contexts associated with SES can foster or promote proximal processes or, in contrast, interfere or prevent proximal processes. Furthermore, the reciprocal relation between SES and the individual is influenced by the characteristics of the person (e.g., interests, motivation, curiosity, and cognitive resources), other social identities (e.g., gender/sex, race/ethnicity), and other contexts (e.g., rural, institutions).

To assist with theorizing connections between SES and human development, I outline a conceptual model informed by bioecological systems theory (Figure 1). This model suggests that it is not SES or any of its components that directly affect developmental outcomes, rather, it is the stratified contexts and resources associated with the cultural values ascribed to components of SES that facilitate and/or constrain intraindividual change across time. That is, objective components of SES (e.g., income) afford individuals status and privilege, or lack thereof, to choose contexts and desired resources that promote or allow proximal processes for favorable developmental outcomes. Importantly this indirect path suggests that contexts associated with particular levels of SES uniquely influences proximal processes (e.g., unstable versus rigid environments). Importantly, as depicted in Figure 1, other cultural systems (e.g., racism) have the potential to impact SES, its association with contexts and resources, and related outcomes. With this in mind, a cultural perspective to SES would extend understanding of the patterns of relations between SES and development.

**SES and Culture**

A cultural lens to SES is important for understanding how contexts associated with SES influence cognitive and behavioral development. Prior cultural work has

examined the association between SES and the sociocultural self (Stephens, Markus, et al., 2014). This research suggests that an individual's SES background has a profound influence on the development of their values and behaviors. For instance, SES has been related to the degree to which individuals can achieve the cultural preference of independence and the American Dream (Stephens, Fryberg, & Markus, 2012). Typically, youth from higher SES backgrounds have more capital and opportunities to explore their individual self, their preferences, and interests in a stable and safe environment (Stephens, Markus, et al., 2014). Additionally, their life chances are not largely dependent on social relationships, which makes attending to others less incentivizing (Fiske, 2010; Kraus & Keltner, 2009). In contrast, youth from lower SES backgrounds have fewer opportunities and more instability, which requires them to develop selves, preferences, and interests that are culturally adaptive to the people around them and in their context (Stephens, Markus, et al., 2014). Additionally, their life chances are more dependent on social relationships so they are more likely to attend to others and their environment (Kraus et al., 2012).

A cultural approach to understand SES can also be used to unpack the specific contexts associated with the cultural system of SES. Therefore, in addition to the physical environmental contexts, SES shapes the social and historical contexts that contain a particular set of people, places, and practices (Stephens & Townsend, 2013). In other words, individuals interact with distinct cultural contexts associated with their SES, which exposes them to different social networks, institutions, and experiences. These experiences across time can shape their identity, cognition, and behavior (Destin et al., 2017). As a result, contexts associated with SES are likely to promote or inhibit the type

of proximal process that are culturally specific based on current and historical conditions. The distinction is important because it avoids assumptions of cultural deficiencies for a particular level of SES, that is, the values and behaviors shared among people from similar SES backgrounds is largely driven their interaction with certain people, places, and practices.

Youth from higher SES backgrounds are more likely to interact with cultural contexts characterized by individual achievement and success in homogenous settings; these contexts are more rigid. It is often the case that these youth interact with high achieving schools with other youth from similar SES backgrounds (Owens, 2018), which are valued given their achievement standards, enriched extracurricular activities, and potential to gain acceptance into high ranking universities (Luthar et al., 2013; Luthar, Kumar, et al., 2020). Youth in these cultural contexts are more likely exposed to proximal processes that emphasize achievement and competition over proximal process that promote development in other domains or act as a buffer to stress derived from the pressure to achieve. Historically contextualized, wealth is glorified in American culture, primarily driven by the ideal of the American Dream (McNamee & Miller, 2009). Therefore, higher SES can lead to an overemphasis of obtaining wealth (Wang et al., 2019) and can create excessive social comparisons between peers, leading intergroup competition (Luthar, Suh, et al., 2020). Furthermore, the desire for wealth can cause college students to question their status identity (Destin et al., 2017).

Youth from lower SES backgrounds are more likely to interact with cultural contexts charaterized by adaptation and experiences of exclusion and discrimination, which intersect with other cultural systems of power; these contexts are more unstable. It

is often the case that these youth attend public schools with lower funding (Baker et al., 2016), live in disadvantaged neighborhoods (Leventhal, 2018), and experience discrimination based on their social position (Lott, 2012). Youth in these cultural contexts are more likely exposed to proximal processes that emphasize competencies for adjusting and accommodating to changes in the environment, over proximal process that promote development in other domains that prioritize individual achievement and mobility. Historically contextualized, lower SES is devalued and is often seen as a result of individual deficiencies and failures rather than structural barriers such as classism, or the cultural system of power over those from lower SES by those of higher SES (Bullock & Lott, 2010). Youth who have the opportunity to attend higher education are thrust into places where their cultural background does not match (e.g., cultral mismatch; Stephens et al., 2018). Futhermore, this cultural system of power overlaps with other systems of power, such as racism and sexism, which can uniquely exclude and discriminate people (E. R. Cole, 2009; Crenshaw, 1991). Given that SES is integrated across levels of organization it is important to consider other cultural and historical stratification factors including race/ethnicity and gender/sex (e.g., Wallace et al., 2016).

The cultural contexts associated with youth in the middle of the extreme ends of SES are less clear, although, they are likely more balanced than the cultural contexts of the lower and higher SES. Being in the middle of the extreme ends of the SES continuum is sometimes considered middle class; that is, individuals who do not consider themselves upper or lower class. Defining what it means to be middle class is challenging because it assumes there is one common group between lower and upper class. Some social class analysists consider an overall middle class category ineffective in research because there

are other dimensions that divide people typically categorized as middle class (e.g., level of authority, expertise; Wright, 2006). Nonetheless, the term middle class is commonly applied in political discourse. The United States Department of Commerce (2010) operationalized middle class for the Middle Class Task Force of the Vice President. They argued that middle class is better explained by values, expectations, and aspirations than income alone because some individuals with lower and higher income levels also consider themselves as middle class. From this perspective, youth from middle SES backgrounds are more likely to interact with cultural contexts that emphasize hard work, planning, and saving to achieve goals such as a balanced education and economic stability and opportunity.

**SES, Culture, and Development**

Understanding the interplay between SES, culture, and development can be further advanced by incorporating the framework of developmental psychopathology in a bioecological systems model. Developmental psychopathology draws attention to identifying continuity *and* deviation from normal (or typical) pathways of development (Cicchetti, 1984; Cicchetti & Cohen, 1995; Cicchetti & Toth, 2009). Similar to bioecological systems theory one of the aims of developmental psychopathology is to examine the interplay between contexts and the biology and psychology of an individual across the lifespan (Cicchetti & Toth, 2009). In this framework, it is acknowledged that individuals begin on a typical course of development, but certain choices, based on prior and subsequent experiences, lead to varying patterns of adaptation (Sroufe, 1989). Sroufe (1989) suggested that individuals deviate from normal trajectories if their way of dealing with issues within their developmental period impacts interactions with issues in future

developmental periods. As follows, there are reciprocal interactions between the individual and their environment that impact later interactions. Therefore, the trajectory of a particular development outcome can be theorized based on the relation of past proximal processes and the specific developmental outcome. For example, based on a Weberian framework social class, different levels of SES are theorized to be associated with different life chances (Breen, 2002). In effect, youth at various levels of SES have different opportunities available for developing their competencies. SES can facilitate or constrain choices that affect how an individual deals with a set of particular issues that ultimately impact future adaptations.

Developmental psychopathology also contributes to bioecological systems by recognizing that cultural systems, such as SES, can take the form of a promotive and/or risk factor (Causadias, 2013). A promotive factor can be defined as a proximal process that increases the likelihood of a normative developmental trajectory. A level of SES can be understood as a promotive factor, for example, if it increases the probability of greater academic achievement. A risk factor can be defined as a proximal process that increases the likelihood of deviating from a normative developmental trajectory (Cicchetti, 2006). A level of SES can be understood as risk factor, for example, if it increases the probability of developing depressive symptoms. A distinguishing feature between promotive and risk factors is the kind of developmental outcome; promotive factors lead to competence and risk factors lead to dysfunction (Causadias, 2013). Therefore, promotive and risk factors are not on the same spectrum, that is, a low risk does not indicate a greater promotive effect. Likewise, promotive factors do not decrease of buffer the likelihood of dysfunction; those processes, in response to adversity are considered

protective factors or processes (Luthar et al., 2000). Nevertheless, a level of SES can be a promotive and a risk factor, that is, a promotive factor for academic achievement and a risk factor for depressive symptoms.

Investigating the relation between SES and academic achievement can elucidate evidence on the promotive role of SES in maintaining normative trajectories of development. Academic success is generally considered an expected trajectory of development, especially in the United States, because it is important for future SES and success in adulthood (Strenze, 2007), intelligence (Ritchie & Tucker-Drob, 2018), and cognitive aging (Lövdén et al., 2020). One of the more commonly used indicators of academic success is academic achievement which indicates a youth's performance on specific educational requirements and is most often measured using grades or grade point average (GPA; York et al., 2015).

A student's SES background has a meaningful influence on their achievement performance. A wealth of research is supportive of this relation, especially for income and parental years of education (Reardon, 2011). The majority of evidence suggests that higher SES is related to greater achievement with some indication that the strength of this relation varies by how SES is measured, grade level, and race/ethnicity (Caro et al., 2009; Kim et al., 2018; Sirin, 2005). By eighth grade, youth from higher SES backgrounds are approximately three years ahead of youth from lower SES backgrounds, a trend that has remained relatively stable in the United States (Hanushek et al., 2020). Furthermore, SES earlier in life has been related to future achievement over and above genetics, accounting for more variability in achievement than genetic variation (von Stumm et al., 2020). The amount of available resources is one main explanation for the link between SES and

academic achievement. Research has shown that parents from higher SES backgrounds have more financial resources to invest in their children's education, such as purchasing educational material or private tutoring, compared to those from lower SES backgrounds (Bradley et al., 2001; Conger & Donnellan, 2007; Haveman & Wolfe, 1995). In turn, these resources are directly associated with achievement performance (Sirin, 2005) and indirectly through cognitive development (Deer et al., 2020; Rosen et al., 2020). However, as discussed in more detail below, having access to desired resources can create rigid home environments. Overall, SES affords access to desired resources that promote or allow proximal processes for academic success.

Investigating the relation between SES and depressive symptoms can elucidate evidence on the risk of SES in deviating from normative trajectories of development (Cicchetti & Toth, 1998). As a form of mental health, depression can be conceptualized as a developmental deviation because it is not an adaptive course of development (Sroufe, 1989). Clinical depression, such as major depressive disorder, is a prevalent mental health concern among the general population of the United States (Kessler et al., 2003; The US Burden of Disease Collaborators et al., 2018), and impacts nearly five percent of the global population (World Health Organization, 2017). Often, researchers examine depressive symptoms as a risk for developing clinical levels of impairment. There are many measures of depressive symptoms such as the Center for Epidemiologic Studies Depression Scale (CESD; Radloff, 1977) and Beck Depression Inventory (BDI; Beck et al., 1996). Across the frequently used measures of depressive symptoms there is little overlap in the type of symptoms, but common depressive symptoms include a decrease in mood, appetite, energy, and sleep (Fried, 2017).

Lower SES is typically associated with a higher number of depressive symptoms. For instance, higher levels of depressive symptoms have been found among the lowest, compared to highest, SES groups (Lemstra et al., 2008; Lorant et al., 2003), and decreases in SES over a year have been related to an increase in the risk of depressive symptoms (Lorant et al., 2007). Examining levels of SES that are related to this developmental deviation is important because depression in childhood is related to major depression, conduct disorder, and suicidal behavior in adulthood (Harrington et al., 1996; Pine et al., 1999). Although several proximal processes can contribute to the development of depressive symptoms, those processes that produce stress may be one chief pathway by which SES is related to depressive symptomatology. Prior research has found that stress explains a substantive portion of variability in depressive symptoms between SES groups (Turner & Lloyd, 1999). Individuals from lower SES backgrounds are often exposed to physical (e.g., environment; Evans, 2004) and social (class-based discrimination; Lott, 2012) stressors. Therefore, most research focuses on understanding how lower SES contributes to the development of depressive symptoms. In contrast, higher SES backgrounds can also expose individuals to proximal processes that create stress (Luthar, Kumar, et al., 2020). In effect, it would be consistent with theory to also find associations between higher levels of SES and greater depressive symptoms compared to more average levels of SES.

Although, scholars have extensively investigated the potential promotive and risk effects associated with different levels of SES, this evidence has been largely produced by one conceptual model, which I refer to as *more is always better*. That is, research generally shows that higher SES is related to better developmental outcomes, such as

academic achievement as noted above. In turn, efforts to improve developmental outcomes often focus on providing resources (e.g., income, educational material; Duncan et al., 2017) and reducing structural and/or cultural barriers (e.g., access to education, match of learning styles; Dittmann & Stephens, 2017). A conceptual consequence of this model is that lower SES is pathologized, suggesting that individuals from lower SES backgrounds are deficient in some way. This approach limits understanding of the promotive effects within families from lower SES backgrounds, as well as the risk factors for families form higher SES backgrounds. In a step towards overcoming the popular more is always better model of SES I propose a competing model that acknowledges the potential risk associated with higher SES: *better is somewhere in the middle*. As discussed in more detail below, this competing model has the potential to advance theory and policies targeting poverty alleviation and wealth distribution.

**More is Always Better**

A more is always better model of SES suggests that higher SES is a promotive factor and lower SES is a risk factor. Monotonic models of SES, in general, have the underlying assumption that more is always better. Monotonic relations can be linear, a constant step-wise change, or non-linear in the sense that the magnitude of association changes across the SES gradient, but the sign does not change (J. Cohen et al., 2003). One example of monotonic relation is a linear correlation. For instance, a positive correlation between SES and academic achievement suggests that each unit increase in status is related to a constant increase in achievement; a negative correlation between SES and depressive symptoms suggests that each unit decrease in status is related to a constant increase in symptoms (Figure 2). In other words, the sign of a positive or

negative correlation remains the same across the SES gradient. In effect, youth in higher SES families are more likely to have adaptive developmental outcomes and fewer deviations whereas youth in lower SES families are at risk for more developmental deviations and fewer opportunities to achieve desirable adaptation. Given this assumption (i.e., poverty is bad, wealth is good), most theory and research has focused on this pattern of relation with adaptative and maladaptive correlates.

There are generally a set of underlying assumptions about how phenomena are related within family and child development theories (Lerner, 2006; S. R. Smith & Hamon, 2012), which, as applied to SES, typically imply that more is always better. For instance, several theories emphasize higher SES as a promotive factor. The resources investment model suggests that having more financial resources affords parents more opportunities to purchase materials and service to promote their children's learning and cognitive development (Conger & Donnellan, 2007). Prior work shows that parents with greater income spend more on educational materials compared to parents with lower income (Duncan & Murnane, 2011; Kornrich, 2016). On the other end of the SES distribution, several theories emphasize lower SES as a risk factor. Classic models relating to SES including social selection and social causation, although they are competing models, suggest that some negative process is occurring that adversely impacts individual health and future success. A large body of research shows that conditions associated with lower SES are related to poorer physical and mental health (Adler & Newman, 2002; Huston & Bentley, 2010; Reiss, 2013). Similarly, the family stress model suggests that a lack of financial resources causes strain among parents, who worry about making ends meet, which leads to poor mental health, parental conflict, and

disorganized parenting in a way that adversely impact children's development (Conger et al., 2010). Overall, the more is always better model is assumed in most mainstream theories linking SES to important developmental outcomes, which is consistent with a large body of evidence.

Consistent with theoretical assumptions, lower SES is, in fact, often associated with adverse developmental outcomes (Bradley, 2018; Devenish et al., 2017; Korous et al., 2018; Reiss, 2013) whereas higher SES is often related to normative outcomes (Korous et al., 2021; Lawson et al., 2018; Sirin, 2005). Therefore, there is evidence to support a more is always better model for SES (i.e., higher SES = promotive, lower SES = risk), and this evidence necessitates novel and impactful ideas to alleviate observed achievement and health disparities between those from higher and lower SES backgrounds in the United States (Adler & Newman, 2002; Hanushek et al., 2020; National Academies of Sciences, Engineering, and Medicine, 2019a). This evidence also highlights the importance of examining how power in the cultural system of SES maintains social and economic inequalities (Causadias, 2020; Piff et al., 2018). However, the evidence on SES does not necessarily unequivocally support that more is always better because, as discussed in more detail below, the risks associated with higher SES contexts has been understudied thus far; most research on SES has estimated monotonic relations.

Given the lack of competing models, embracing a more is always better model exaggerates developmental deviations among lower SES youth and overemphasizes typical development among higher SES youth. The disproportionate research on the disadvantages of youth from lower SES reinforces a deficit model, which adds to the

discourse that there are innate and cultural limitations of these families and youth (García Coll et al., 1996; Sroufe, 1970). In addition, deficit perspectives overlook adaptive cultures within lower status backgrounds that may promote competencies afford by their context (R. M. B. White et al., 2018). For example, youth from lower SES backgrounds with supportive role models tend to accept and adapt to their challenges (Chen & Miller, 2012). In addition to deficit thinking, the more is always better model also gives rise to and legitimizes meritocratic beliefs and the American dream. Because of the American belief that hard work and individual merit is rewarded equally and translates into success, lower SES is attributed to individual characteristics while situational factors (e.g., barriers) are ignored (Cozzarelli et al., 2001; Hunt & Bullock, 2017). Overall, testing a competing model to the more is always better approach is one step towards identifying the limits of current theories.

**Better is Somewhere in the Middle**

Contrary to the general narrative, higher SES can be a risk factor whereas levels of SES that fall somewhere in the middle of the extreme ends of the distribution can be promotive. I refer to this model as better is somewhere in the middle. There is accumulating and increasing evidence that youth from higher SES backgrounds in high achieving schools, have higher levels of substance use, anxiety, and depression compared to national averages (Coley, Sims, et al., 2018; Ebbert et al., 2019; Luthar et al., 2013; Luthar, Kumar, et al., 2020; Luthar & Kumar, 2018). Notably, clinical levels of depression and suicide ideation have substantially increased among the highest income groups compared to lowest income groups (Twenge et al., 2019). Therefore, youth from lower and higher SES backgrounds experience chronic stress, placing each at a greater

likelihood for developmental deviations (National Academies of Sciences, Engineering, and Medicine, 2019b). This pattern potentially creates a U-shaped relation between SES and developmental deviations, which requires a nonmonotonic model instead of a monotonic model.

A nonmonotonic relation is nonlinear because the direction of its sign changes at some threshold (e.g., positive to negative). A U-shaped, quadratic association is one example of a nonmonotonic relation. For instance, an inverse quadratic relation between SES and academic achievement suggests that each unit increase in status is related to an increase in achievement, but only up to a certain threshold at which point there is a subsequent decrease in achievement (Figure 2). A quadratic relation between SES and depressive symptoms suggests that each unit increase in status is related to a decrease in depressive symptoms, but only up to a certain threshold at which point there is a subsequent increase in depressive symptoms. In effect, children in families with SES somewhere in the middle are more likely to have typical developmental outcomes and fewer deviations whereas youth in lower *and* higher SES families are at risk for more developmental deviations and fewer opportunities to achieve desirable adaptation.

Bioecological systems theory supports predictions based on a better is somewhere in the middle model of SES for particular outcomes. The more noteworthy prediction based on a better is somewhere in the middle model is that higher SES can lead to developmental deviations. This is counterintuitive because one would think that having greater access to resources and less exposure to scarcity and exclusion would contribute to maintaining a normative developmental trajectory. At the same time, this assumed advantage carries potential costs as higher SES is associated with different contexts than

lower SES. Within contexts associated with higher SES, the access to resources creates a particular standard of achievement, which contributes to an atmosphere of competition (Luthar, Kumar, et al., 2020). In turn, having an abundance of resources can lead those from higher SES backgrounds to feel obligated to take advantage of those opportunities and attribute failure to personal attributes because of the opportunities afforded to them (Luthar et al., 2013). Relatedly, high achieving schools are a unique context associated with higher SES (Ebbert et al., 2019). Contrary to common beliefs, high achieving schools can be a risk factor. Being in a high achieving group can exacerbate anxiety because other high status and high achieving peers serve as the reference group to compare one's competencies and achievement accolades (i.e., big fish in a little pond effect; Marsh et al., 2008; Pekrun et al., 2019). Taken together, distinct interactions between the person and contexts associated with higher SES can lead to developmental deviations, suggesting that relations between SES and adverse developmental outcomes (e.g., depressive symptoms) may be curvilinear.

Despite this plausible U-shaped relation, few studies have quantitatively tested it across components of SES, especially in connection to academic achievement and depressive symptoms. Piotrowska and colleagues (2015) reported that a cubic (S-shaped) relation with antisocial behavior fit the data better compared to a linear or curvilinear model. Their data suggested a decrease in antisocial behavior in the middle of the income distribution and less of an effect on the extreme ends. Schnittker (2004) found a curvilinear, but monotonic, relation between income and health, but only among adults with lower educational attainment; the effect was more linear among highly educated adults. Lund and colleagues (2017) did not find a non-linear association with anxiety and

depression combined, but found a nonmonotonic curvilinear relation with conduct problems. They showed that the top one percent of the distribution had just as high of conduct problems as the lowest ten percent of the distribution (Lund et al., 2017). Coley, Sims, and colleagues (2018) also found a quadratic effect between family income and intoxication and violence, but only among adolescent males. In sum, there is some evidence to suggest that the developmental relations with components of SES can be nonmonotonic.

Evidence on the better is somewhere in the middle model shifts attention from a deficit perspective to understanding the mechanisms of SES across different levels. The mechanisms that foster or impede proximal process that maintain normal trajectories of development are likely to vary between youth from lower and higher SES backgrounds in distinct and meaningful ways. For instance, the developmental challenges faced by youth from higher SES backgrounds are, in part, driven by the economic pressure to excel beyond their peers, which can compromise protective factors such as family and peer relationships (Luthar, Kumar, et al., 2020). To become the best in a high achieving school, there is a constant tendency for comparing oneself to peers in high achieving schools, which is exacerbated by social media (Luthar, Suh, et al., 2020). In turn, youth from higher SES backgrounds have greater feelings of envy towards peers compared to their counterparts from lower SES backgrounds (Lyman & Luthar, 2014). Tensions between peers is a critical issue because social support tends to shift from parents to peers during adolescence (Helsen et al., 2000) so ongoing competition between peers may leave youth feeling isolated. The drive to stand alone in the top-tier (a little pond) may, in fact, leave youth feeling alone. On top of this, high achieving youth are also likely to

receive less support from parents and teachers (Luthar, Kumar, et al., 2020). Therefore, high SES youth have little support for dealing with their specific challenges, which in turn can lead to developmental deviations. Overall, although the pressures experienced by youth from lower and higher SES are different (i.e., struggling to meet basic needs compared to unrelentless strain to achieve, respectively) they may have the same outcomes (i.e., equifinality; Cicchetti & Rogosch, 1996).

In sum, theory and empirical evidence supports the framework for the better is somewhere in the model of SES. However, the empirical evidence testing the nonmonotonicity of relation between SES and important developmental outcomes such as depressive symptoms in underdeveloped. Instead, there are two distinct lines of inquiry with one line of research investigating the promotive effects of higher SES and the risk of lower SES (i.e., monotonicity of SES) and one line of research examining the risks of contexts associated with higher SES. Integrating these models can potentially advance theoretical understanding of SES and human development because it will draw attention to the mechanisms across levels of SES that are either promotive of normal trajectories or a risk for developmental deviations.

**Developmental Period and SES**

Whether a particular level of SES is promotive of achievement or a risk factor for depressive symptoms may vary at different time points in development (Rutter & Sroufe, 2000). At any one point in development, an individual's current context and linkage to prior experiences play an important role in understanding continuities and discontinuities of development (Lerner, 2003; Sameroff, 2000). Conditions across levels of SES may constrain an individual's ability to positively adapt to challenges specific to their

developmental period, which can affect their current and future achievement and mood (Cicchetti & Toth, 1998; Rutter & Sroufe, 2000). Additionally, the stressors associated with a particular level of SES may be more salient at different ages (Cicchetti & Toth, 1998), which makes it more likely that the magnitude of a quadratic effect would vary across development periods. For instance, lower status conditions (e.g., scarcity, violence) may be noticeable at a younger age whereas pressure to achieve may not be felt until high school and, therefore, the difference between the extreme ends may magnify with increasing age (Luthar & Latendresse, 2005b). Therefore, it is likely that the pattern of associations with SES are different for children compared to adolescents, adults, and older adults. However, prior evidence precludes definitive conclusions about the role of developmental period in moderating the associations between SES and developmental outcomes, namely, academic achievement and depressive symptoms.

There is some variation in the association between SES and academic achievement by developmental period. Prior research has shown that the achievement gap between lower and higher SES remains similar between the 7 to 11 years of age and but widens across the between 12 to 15 years of age (Caro et al., 2009). Therefore, although SES is associated with achievement across all ages, the magnitude of this difference may be larger for older, compared to younger, students. Meta-analytic evidence on these differences is mixed (Korous et al., 2021) such that one meta-analysis found that the association between SES and academic achievement was larger among students in higher grade levels (Sirin, 2005) whereas two other meta-analyses found that the association was larger among students in lower grade levels (Harwell et al., 2017; K. R. White, 1982). The latter is consistent with other work suggesting that lower income earlier in life is

more impactful than in later adolescence (Huston & Bentley, 2010). Despite the literature on the role of developmental period on the monotonic relation between SES and academic achievement, the impact of developmental period on the nonmonotonic relation has been understudied. However, it is more likely that the relation between SES and academic achievement is monotonic. Therefore, a more is always better model is likely to vary between developmental periods, but the extent that the better is somewhere model applies to different developmental periods is unclear.

There is also some variation in the association between SES and depressive symptoms by developmental period. Prior research has shown that the association between SES and depressive symptoms increases in magnitude with age (Miech & Shanahan, 2000) whereas other research has found that the magnitude of association decreases with age (McLaughlin et al., 2011; Reiss, 2013). Notably, depressive symptoms may take different forms across age in terms of the symptoms and severity (Rutter & Sroufe, 2000; Sameroff, 2000), which makes it challenging to compare the magnitude of association across different developmental periods. In contrast to the literature on the monotonic relation between SES and depressive symptoms, the impact of developmental period on the nonmonotonic relation has been understudied. Overall, the magnitude of the more is always better model is likely to vary across developmental periods whereas the extent that better is somewhere in the middle model of SES differs between developmental period is unclear at this point. Unpacking these differences is likely to aide in understanding the mechanisms by which SES affects human development.

**Gender/Sex and SES**

Whether a particular level of SES is promotive of achievement or a risk factor for depressive symptoms may also vary between females and males as they likely experience SES differently. Like SES, gender/sex is a social stratification characteristic, thus, men are generally ranked higher in status compared to women in the United States (Fiske, 2010). In turn, the contexts and resources associated with SES may by different for men and women. Among contexts associated with lower SES, females have a greater concern for safety and fear of sexual victimization compared to males (Popkin et al., 2010). Among contexts association with higher SES, females tend to be overburdened from childcare and household responsibilities in addition to expectations of high performance at work (Luthar et al., 2013). Mothers are more involved in their children's activities (Bianchi, 2000). Additionally, females with college degrees generally earn less money than males with college degrees (Bobbitt-Zeher, 2007). These distinct challenges women experience across levels of SES may make the pattern of associations with SES different for females and males. However, prior evidence precludes definitive conclusions about the role of gender/sex in moderating the associations between SES and developmental outcomes, namely, academic achievement and depressive symptoms.

There is little evidence to infer that the association between SES and academic achievement varies between females and males. Although gaps in achievement have been documented between females and males, mostly by specific subjects, most work has examined gender gaps separately from SES gaps (Ellison & Swanson, 2018; Fortin et al., 2015; Lovelss, 2015). Moreover, across four meta-analyses on the association between SES and academic achievement, none examined sex as a moderator (Harwell et al., 2017;

Kim et al., 2018; Sirin, 2005; K. R. White, 1982). One study on the trend of achievement gaps found no evidence that the rate of change in the gap between low and high income groups varied between females and males (Reardon, 2011). Another study found larger gender gaps in achievement in higher SES school districts compared to lower SES school district (Reardon et al., 2019). Given the sparseness of evidence on the differences between females and males in the association between SES and academic achievement, it would be informative to test if gender/sex impacts the magnitude of effects in the more is always better and better is somewhere in the middle models of SES.

There may be some variation in the association between SES and depressive symptoms across females and males. Prior work has shown that SES has a larger association with depressive symptoms among females compared to males (Lorant et al., 2003; Peplinski et al., 2018) whereas other research has reported no interaction between SES and gender/sex (Amone-P'Olak et al., 2009; Lemstra et al., 2008; Mendelson et al., 2008). Among studies conducted on high SES adolescents, the direction of the difference has varied between females and males (Luthar, Suh, et al., 2020; Luthar & Latendresse, 2005b). While research has disaggregated monotonic relations by gender/sex, as well as for youth higher SES backgrounds, less work has examined gender/sex differences in nonmonotonic relations between SES and depressive symptoms. Among these studies, there was no evidence of a quadratic association between SES and depressive symptoms for females or males (Coley, Sims, et al., 2018; Lund et al., 2017). However, Lund and colleagues (2017) found a significant quadratic effect between SES measured at the school level for boys, but not girls. Therefore, although there is evidence to suggest that gender/sex impacts the magnitude of effects in the more is always better model of SES,

but there is little to no evidence yet to conclude that the better is somewhere in the middle model of SES differs between females and males. Unpacking these differences is likely to aide in understanding the mechanisms by which SES affects human development.

**Race/Ethnicity and SES**

Whether a particular level of SES is promotive of achievement or a risk factor for depressive symptoms may also vary between racial/ethnic groups. Like SES, race/ethnicity is a social stratification characteristic, thus, White Americans are generally ranked higher in status compared to Americans of color (Fiske, 2010). In turn, the contexts and resources associated with SES may rely on its interplay with race/ethnicity. Racial/ethnic minorities experience disparate life conditions because of racism (García Coll et al., 1996). Intersections with SES, therefore, lead to unique experiences for different racial/ethnic subgroups within the same level of status. For instance, racial/ethnic minority subgroups in the United States have less opportunities to obtain the same level of occupations and income despite comparable education (Darity Jr et al., 2018; Williams, 1996), and not all forms of cultural capital are recognized in traditional theories of social class (Yosso, 2005). White families from higher SES backgrounds are also more likely to live in affluent school districts compared to Black families from similar SES backgrounds (Owens, 2018). In addition, the marginalization-related diminishing returns hypothesis posits that, among racial/ethnic minority individuals, SES has smaller associations with specific outcomes compared to White individuals (Assari, 2017b, 2018a). The lack of benefit of SES for racial/ethnic minorities may be attributed to racial discrimination as higher SES is associated with increased experiences of discrimination for Black, Latinx, and Asian Americans (Assari & Caldwell, 2018; Colen

et al., 2018; Luthar et al., In press). Overall, there are general differences in certain outcomes between racial/ethnic groups in the United States (Causadias et al., 2018a), which cannot be fully explained by SES because of systemic racism and racial segregation (Williams, 1996). Therefore, it is likely that the pattern of associations with SES vary between racial/ethnic groups. Prior evidence provides some support about the role of race/ethnicity in moderating the associations between SES and developmental outcomes, namely, academic achievement and depressive symptoms.

There is some variation in the association between SES and academic achievement between racial/ethnic populations. Prior research has shown that although higher SES during childhood is related to increases in academic achievement, this association is stronger for White youth compared to Black, Latinx, and Asian American youth (Assari, 2018c; Assari et al., 2020a, 2020c; Battle & Lewis, 2002). Meta-analyses have also shown larger effect sizes between SES and academic achievement for study samples with a greater percentage of White participants compared to Black, Latinx, and Asian American participants (Harwell et al., 2017; Sirin, 2005). Despite the growing literature on the role of race/ethnicity on the monotonic relation between SES and academic achievement, the impact of race/ethnicity on the nonmonotonic relation has been understudied. It is more likely that, overall, the relation between SES and academic achievement is monotonic, but the exposure to discrimination in relatively affluent and high achieving settings (Colen et al., 2018) may undermine achievement for racial/ethnic minorities from higher SES backgrounds compared to those from SES backgrounds somewhere in the middle.

There is also some variation in the association between SES and depressive symptoms between racial/ethnic populations. Prior evidence on monotonic relations between SES and depressive symptoms have found differences between racial/ethnic subgroups (Hudson et al., 2013; Peplinski et al., 2018). For instance, higher educational attainment has been related to a lower likelihood of developing major depressive disorders among White adults, but not among Black, Latinx, and Asian American adults (Gavin et al., 2010). Similarly, another study found a smaller association between income and major depressive disorders for Black, compared to White, adults (Assari, 2018b). Prior evidence also suggests a potential difference in the risk of higher SES for racial/ethnic minorities. For example, Black males with a high school diploma were found to have more depressive symptoms, compared to Black males without a high school diploma, whereas a high school diploma was related to fewer depressive symptoms among White females and males (Assari, 2017a). Overall, more may not always be better for racial/ethnic minorities in relation to SES and depressive symptoms. The extent that better is somewhere in the middle model of SES differs between racial/ethnic groups is unclear at this point. Unpacking these differences is likely to aide in understanding the mechanisms by which SES affects human development.

**Summary**

Although scholars have amassed of body of evidence on the developmental effects of SES, this research has primarily maintained the assumption that higher SES is unequivocally better for development, which hinders advancing theory and formulating interventions. I identified two competing models in the SES literature: more is always better versus better is somewhere in the middle, and I argued that research on the link

between SES and development should consider investigating the better is somewhere in the middle model in order to challenge deficit modeling of youth from lower SES backgrounds and to challenge beliefs in meritocracy. The better is somewhere in the middle model of SES can also help identify promotive and risk factors at all levels of SES, thus, improving understanding of the pathways linking SES to human development.

CHAPTER 3

# A Meta-Analysis of Individual Participant Data

The aim of my dissertation was to compare two models of SES (Figure 3): more is always better versus better is somewhere in the middle. My dissertation contributes to the SES literature because the patterns of association between SES and human development has been understudied. The scant research comparing these models, thus far, has primarily relied on single datasets. Therefore, a more robust test of these competing models can be conducted by pooling across multiple datasets using meta-analytic methodology.

## Meta-Analysis

Meta-analysis is a statistical method for pooling together data from multiple samples, which can provide more reliable estimates of effect sizes (Gurevitch et al., 2018) and can be highly useful for developmental research (Roisman & van IJzendoorn, 2018). Traditionally, meta-analysis has been used to aggregate across effect sizes (e.g., correlations) reported in published and unpublished records (e.g., studies, reports). These records are often identified from a systematic search of the literature to ensure the sample of effect sizes is representative of the distribution of interest, although meta-analysis methods can still be applied regardless of the type of search.

Because meta-analysts have traditionally relied on aggregate data, they have primarily estimated relations from a more is always better approach (e.g., correlations, differences between highest and lowest categories; Eysenck, 1994). For instance, only one meta-analysis to date has examined quadratic relations with SES. Lorant and colleagues (2003) found more evidence favoring a linear model over a quadratic model in

the relation between income, education, and depressive symptoms among adults. In their meta-analysis they regressed the log odds ratio on the quadratic term of income and education. This test could be advanced by using individual participant data (IPD) rather than aggregate estimates.

**Individual Participant Data (IPD)**

Meta-analytic methods can be applied to aggregating IPD across multiple datasets either in one stage or two (Riley et al., 2008, 2010). In a one-stage approach, information from each dataset is pooled together in a single step by estimating the specified model simultaneously while adjusting for the clustering of participants within each sample. In a two-stage approach, effect sizes (e.g., correlations) or model-based estimates (e.g., betas) and other relevant information (e.g., moderators) are extracted from each sample and then in an additional step they are pooled together using meta-analytic methods (e.g., random effects) in the second stage like a traditional meta-analysis (Riley et al., 2008). In fact, meta-analysts can combine IPD and aggregate results extracted from records using a two-stage approach (Pigott et al., 2012). A two-stage method has also been applied to analyzing large datasets using a split/analyze/meta-analyze approach (Cheung & Jak, 2016). In sum, meta-analytic methods extend beyond systematic reviews and summarizing the evidence, to aiding comprehensive investigations of novel research questions using IPD.

Using IPD has two important advantages over and above aggregate data. First, meta-analyzing IPD has greater power to detect moderation by individual level characteristics whereas aggregate data relies on the reporting of study level characteristics (Lambert et al., 2002). For instance, Hornburg and colleagues (2018)

found moderation using an IPD meta-analysis, but not from aggregate data. Likewise, relying on study level differences in meta-analysis increases the risk of ecological bias (Pigott et al., 2012). Second, IPD meta-analysis can account for multiple variables. For instance, Verhage and colleagues (2018) meta-analayzed IPD to test moderation by child age while controlling for parental age. A meta-analysis of IPD on SES can estimate the association between income and depressive symptoms while controlling for the effect of education and occupation. In this dissertation, I aimed to apply meta-analysis methods to aggregate across IPD in order to estimate quadratic relations over and above linear relations, and to test individual level moderators of these relations while controlling for the effect of other moderators. These tests would be limited using aggregate data.

In this dissertation, I used data from a larger IPD dataset on racial/ethnic disparities in depressive symptoms in the United States (Causadias et al., 2018b). In this IPD dataset a systematic search was conducted on Inter-university Consortium for Political and Social Research (ICPSR). Datasets were included if they employed a psychometric measure of depressive symptoms and included two or more racial/ethnic subgroups with at least 300 participants of each. Additionally, datasets were only included if they randomly sampled from two or more states in the United States. In effect, each eligible dataset aimed to recruit a nationally-representative sample and contains data for participants from more than one state. This pool of datasets was also designed to test racial/ethnic differences (Causadias et al., 2018b), thus, providing a compelling test of moderation by race/ethnicity. Although there is variability in sampling and measurement across these datasets, meta-analysis conventionally combines evidence that is deemed comparable (Glass, 1977). Given the relation between two latent constructs of interest, it

can be assumed that different measures of the same constructs are estimating one effect in the distribution of effect sizes (Card, 2012). Sensitivity and/or moderator tests can be used to examine these assumptions.

In the proposed dissertation, I examined a monotonic model (i.e., more is always better) and a nonmonotonic model (i.e., better is somewhere in the middle) for the association between components of SES, depressive symptoms, and academic achievement. I addressed two research questions from the orientation of estimation and model fit (Cumming, 2014; Little et al., 2017). I also followed reporting standards for meta-analyses of IPD (Stewart et al., 2015). I pre-registered my research questions, hypothesis, and method on OSF (see https://osf.io/fhdbu). This study was approved by the IRB at Arizona State University.

**Research Question #1**

Does a nonmonotonic (quadratic) model of the relations between components of SES (i.e., income, education, and occupation status), depressive symptoms, and academic achievement (grade point average) fit better than a monotonic (linear) model?

***Hypothesis #1***

There will be more support for the nonmonotonic model compared to the monotonic model.

**Research Question #2**

Is the magnitude of relations moderated by developmental period (i.e., childhood, adolescence, young adulthood, adulthood, older adulthood), gender/sex (i.e., male, female), and race/ethnicity (i.e., White, Black, Latinx, Asian American, Native American, Multiracial)? This research question was exploratory.

CHAPTER 4

# Method

## Identifying Studies

The data for this project were pooled from a collection of IPD datasets on racial/ethnic disparities in depressive symptoms, which identified one-hundred and twenty-seven datasets for inclusion. A more detailed breakdown of study identification and systematic search is reported elsewhere (Causadias et al., 2018b). Briefly, a systematic search was conducted in ICPSR to identify open access datasets that were considered nationally-representative. Two search strings were used: String 1 = *depression "United States" -"great depression"*; String 2 = *"depressive symptoms" "United States" -"great depression".* Three reviewers assessed the initially identified datasets for inclusion using eligibility criteria by examining the documentation and, when needed, publications that have previously used those datasets. Below, I list the eligibility criteria used by Causadias and colleagues (2018b), as well as the additional criteria used in the present study.

## Inclusion and Exclusion Criteria

### *Variables*

Only datasets with psychometric measures of depressive symptoms were included. Diagnoses of depression (i.e., clinically depressed or not) by clinicians or self-report were excluded. In addition to these criteria, I excluded datasets with measures of depressive symptoms that employed skip logic because these measures only assess depressive symptoms after participants report feeling depressed or lost interest. (e.g., Composite International Diagnostic Interview; World Health Organization, 1997).

Participants who may have felt a loss of energy or appetite, but did not feel depressed would have skipped the questions on the remaining symptoms. By excluding these measures, I reduced the heterogeneity attributed to measurement. Datasets were included if they recruited participants from two or more racial/ethnic subgroups and were excluded if a participant's race/ethnicity was determined by the interviewer or parental race/ethnicity. Datasets that did not report race/ethnicity of participants were also excluded. In addition to these criteria, I excluded datasets that did not included a relevant measure for at least one of the three components of SES (i.e., income, education, or occupation). I included datasets that were missing a measure of academic achievement (i.e., grade point average or grades) because missing data techniques were used in the analyses.

***Geographic Location***

Datasets that recruited participants from the United States were included (see Causadias et al., 2018b). This restriction is important for testing correlations with SES because its effect on development may vary given specific geographic locations (Bradley, 2016b). Therefore, by restricting datasets to the United States, I reduced some heterogeneity between correlations. Although it is likely that correlations with SES also vary within the United States, this was not the focus of the present study.

***Research Design and Time Period***

Datasets were included if they randomly recruited participants from at least two or more states within the United States. Samples recruited from a single state were excluded as well as convenience samples (e.g., clinical samples). Datasets that randomly sampled from sub-populations (e.g., all adolescents) were included. Longitudinal designs were

also included. In these longitudinal datasets, I used measures of depressive symptoms and academic achievement from a prior wave as a covariate for the current wave. Datasets were also excluded if they were collected from intervention designs. Additionally, only studies with at least 300 White and 300 non-White participants (or 300 Black and 300 Latinx participants) were included. This criterion was based on a power analyses to detect a small effect size between two groups (see Causadias et al., 2018b). Finally, datasets were included regardless of the year the data was collected.

### *Participants*

Participants within each dataset were included regardless of their age, sex, or race/ethnicity. Parents and children within the same dataset were included, in addition to siblings and twins. Participants missing data on depressive symptoms, academic achievement, components of SES, age, sex, or race/ethnicity were excluded.

## Data Items – Participant Level

### *Income*

I extracted the annual income for each participant. When individual income, and household/family income was reported separately, I coded the highest value. For youth under the age 18, I extracted household/family or parental income. In the case that a dataset reported income using intervals, I recoded income as the midpoint of the interval (e.g., $20,000 - $29,999 = $24,999.50). For bottom- or top-coded intervals, I recoded income at the value it was coded (e.g., ≥ $80,000 = $80,000). To compute a quadratic term for income, I mean centered income and squared it.

### *Years of Education*

I extracted the number of completed years of education. For youth under the age 18, I extracted the education level of the parent. When paternal and maternal education was provided, I extracted the variable for each, but only the highest level of education from each dataset was included in the analysis. In the case that a dataset reported education in intervals, I recoded education as the midpoint of the interval (e.g., 9 to 12 years = 10.5). Also, in the case that a dataset measured the highest level of degree completed, I recoded education to best represent the number of years to complete the degree (e.g., Bachelor's Degree = 16). For bottom- or top-coded intervals, I recoded education at the value it was coded (e.g., College Graduate or Above = 16). I also recoded categories without a clear connection to number of years completed as missing (e.g., Vocational School). To compute a quadratic term for education, I mean centered education and squared it.

### *Occupational Status and Prestige*

I recoded the type of occupation of the participants into status and prestige scores. For youth under the age 18, I recoded parental occupation. If the type of occupation was reported for both parents, I only included the highest status and prestige scores in the analysis. Occupational status and prestige scores are based on United States Census Occupational Categorization. Scores for occupational status are based on income and educational levels of the occupation whereas prestige scores are assigned by social ratings. For occupational status, I used the Nam-Powers-Boyd Occupational Status Scale, which is based on the 2000 U.S. Census (Nam & Boyd, 2004). For occupational prestige, I used the prestige scale of Nakao and Tres (1994), which is based on the occupational

categories from the 1980 U.S. Census. Both scales range from 0 (lowest) to 100 (highest). When a classification could not be matched to either of the two scales, I recoded it as missing. Also, when datasets included broad categories of occupational classifications (e.g., Managerial), I coded it as missing. To compute a quadratic term for occupational status and prestige, I mean centered both and squared them.

***Depressive Symptoms***

For each participant, I computed a mean score of depressive symptoms by summing across all items and then dividing the sum by the total number of depressive items completed. I did not include sum scores that had more than 50% missing across all items to make sum scores more comparable across participants, although, I did not examine the extent that sum scores differed between participants that had greater than 50% or not. Higher mean scores indicated a greater number of depressive symptoms.

***Academic Achievement***

I extracted the GPA of participants from either self-report, parent-report, or transcripts. If a dataset did not collect information on GPA, I extracted letter grades and recoded them on a GPA scale (e.g, A = 4.0, B = 3.0). If grades were reported across different subjects (e.g., math, science) I averaged the recoded grades across the subjects.

***Developmental Period***

I extracted the age of each participant. When a birthdate was provided, instead of an age, I subtracted the year of the interview from the participant's year of birth. I coded developmental period based on age: children (5 -11 years old), adolescents (12-17 years old), young adulthood (18-25 years old), adulthood (26-64 years old), older adulthood (65 years and older). I extracted correlations specific to each developmental period. Each

category was dummy coded in the analysis. I used the most frequent developmental period across datasets as the reference category (i.e., adulthood).

### *Gender/Sex*

I computed a dummy code for gender/sex (i.e., 0 = female; 1 = male). I assigned missing values for participants that could not be dummy coded. I extracted correlations for males and females separately.

### *Race/Ethnicity*

I coded the race/ethnicity for each participant, including White, Black, Latinx, Asian American, Native American, and Multiracial (i.e., participants that indicated multiple races) participants. Each racial/ethnic group was dummy coded. I specified White participants as the reference category given that this sub-group generally had a larger sample size. I extracted correlations for each racial/ethnic category.

## Data Items – Study Level

### *Measure of Depressive Symptoms*

I coded the type of measure used to assess depressive symptoms and dummy coded each measure. The specific measures of depressive symptoms included were the Behavior Problem Index (BPI; Peterson & Zill, 1986), CESD (Radloff, 1977), K6+ Self-Reporting Measure (K6; Kessler et al., 2003), Mental Health Inventroy-5 (MHI5; Stewart et al., 1988), Psychiatric Epidemiology Research Interview Demoralization Scale (PERID; Roberts & Vernon, 1981), Public Health Questionnaire-5 (PHQ9; Kroenke et al., 2001) and Short Form-36 (SF36; Ware & Donald Sherbourne, 1992). I used the CESD as the reference category.

### *Measure of Academic Achievement*

I coded whether the type of measure used to assess academic achievement was GPA, grades, or both. I computed a dummy code for each category and specified grades as the reference category.

### *Year of Data Collection*

I coded the year of data collection for each dataset. There could be potential cohort effects such that the status associated with particular levels of income, education, or occupation may have changed across time.

## Analysis Plan

### *Meta-Analytic Structural Equation Modeling (MASEM)*

I used meta-analytic methods and structural equation modeling (SEM) to estimate an overall path model across datasets. There are multiple approaches to combining meta-analysis and SEM (Cheung, 2018). One approach is SEM-based meta-analysis, which treats extracted effect sizes (e.g., Cohen's d, odds ratio) as observed scores and the overall (average) effect size as the latent score (Cheung, 2015a). This approach is similar to using regression in meta-analysis as seen in (1).

$$y_i = \beta_0 + u_i + e_i \quad (1)$$

That is, in a fixed-effects model the observed effect size from each study ($y_i$) is a function of the average effect size in the population (intercept, $\beta_0$) and sampling variance ($e_i$, Var($e_i$) = $v_i$), which is assumed to be known (Borenstein et al., 2010). In a random-effects model, the conditional variability within the distribution of the population of effect sizes is also included ($u_i$, Var($u_i$) = $\tau^2$). Moderators (i.e., sample and methodological characteristics) can be introduced as predictors of $y_i$, where $\beta_1$ is the

regression coefficient, $x_i$ is the observed value of the moderator for each study, and $u_i$ is the residual heterogeneity unexplained by the moderator.

$$y_i = \beta_0 + \beta_1 x_i + u_i + e_i \quad (2)$$

Another approach is MASEM, a multivariate technique (Cheung, 2015a). Rather than using SEM to conduct traditional meta-analyses, as in SEM-based meta-analysis, MASEM pools together correlation matrices into an overall matrix that can be used to estimate a path or latent model (i.e., correlation-based). MASEM can also be used to estimate path models within each sample and, in turn, meta-analyze the SEM parameters (i.e., parameter-based). Here, I focus on the correlation-based MASEM. A correlation-based MASEM was first accomplished using a two-stage SEM approach (TSSEM; Cheung & Chan, 2005). In the first stage, a fixed- or random-effects model is defined, using maximum-likelihood (ML) estimation, to aggregate across extracted correlation matrices into an average correlation matrix, similar to a traditional meta-analysis of correlations.

In the second stage, the average correlation matrix is used as the observed correlation matrix for fitting a specified model. The observed matrix is weighted by its asymptotic covariance matrix with weighted least square (WLS) estimation so that correlations based on larger number of samples have greater emphasis in the model. Moderation can be tested in TSSEM by conducting multiple subgroup group analyses in the first stage and comparing models in which the SEM parameters from stage two are either constrained or freely estimated across groups (Jak & Cheung, 2018). In this approach, evaluating heterogeneity between correlations and fitting the model occurs at different stages. Additionally, when a random-effects model is defined in the first stage,

the uncertainty attributed to $\tau^2$ is not included in the second stage. In effect, larger variability between effect sizes in the average correlation matrix limits the generalizability of its fit with the specified path model (Cheung & Cheung, 2016).

To overcome some of the limitations of TSSEM, Jak & Cheung (2019) developed a one-stage MASEM. Rather than pooling the correlations in one step and fitting a SEM in another step, one-stage MASEM accomplishes both simultaneously with ML estimation. A one-stage MASEM was first developed using fixed-effects model (Oort & Jak, 2016), but Jak & Cheung (2019) extended this approach to estimate a random-effects model. Thus, the one-stage MASEM can be a multivariate random-effects model, which incorporates the variation between the SEM parameter estimates. Additionally, because the SEM parameters are assumed to vary across matrices, reasons for this variability (categorical or continuous moderators) can be investigated. This aspect of one-stage MASEM is powerful because one moderator can potentially be tested while controlling for the moderating effect of other moderators.

A one-stage MASEM also allows for missing data because it uses full information maximum-likelihood (FIML) estimation (Jak & Cheung, 2019). Therefore, correlation matrices can be included even if they are missing a correlation for a specific pair variables. For instance, if a sample has data on depressive symptoms, but not academic achievement, it can still be included. To conduct the analyses described below, I used the metaSEM (version 1.2.4) package (Cheung, 2015b) in the R platform (version 4.0.3). metaSEM uses the OpenMX (version 2.18.1) package (Neale et al., 2016) in R to estimate the SEM parameters.

Correlation matrices from individual datasets are treated similar to participants in a SEM and the correlations within each matrix are treated similar to variables. If there is a missing correlation for a specific matrix, this is handled with FIML estimation. The mean and covariance structures in the one-stage MASEM are derived from vector of correlations and their variances, respectively (Jak & Cheung, 2019). As noted, the one-stage MASEM pools the correlations in a multivariate random-effects model as seen in (3).

$$r_i = \rho_R + u_i + e_i \tag{3}$$

Similar to the regression framework for a random-effects model discussed above (1), the vector of correlations for each sample correlation matrix ($r_i$) is a function of its mean vector of correlation coefficients (the average correlation matrix, $\rho_R$), a vector of deviations of each sample from $\rho_R$ ($u_i$, Var($u_i$) = $\tau^2$), and assumed sampling error ($e_i$, Var($e_i$) = $v_i$). In the one-stage MASEM a specified path model is nested within $\rho_R$ as seen in (4), which includes an identity matrix (**I**), a selection matrix (**F**) for observed (1's) and latent (0's) variables, a symmetrical matrix of regression coefficients (SEM parameters, **A**), and a symmetrical matrix of variance and covariances (**S**; Jak & Cheung, 2019). When correlational matrices are used, such as in the present study, the variances of exogenous variables are fixed to 1 in **S** (Jak & Cheung, 2019). SEM parameters in specified path models are estimated with ML, or FIML when samples have missing correlations.

$$\rho_R = \text{vechs}(\mathbf{F}(\mathbf{I} - \mathbf{A})^{-1}\mathbf{S}(\mathbf{I} - \mathbf{A})^{-1\text{T}}\mathbf{F}^{\text{T}} \tag{4}$$

To illustrate the matrices **A**, **S**, and **F** seen in (4), let income and education be used as two correlated exogenous variables and depressive symptoms as an endogenous

variable in a meta-analytic path model. This model represents 3 by 3 correlation matrices ($r_i$), thus, $\rho_R$ is a 6 by 1 column vector and $\hat{\tau}^2$ and $v_i$ are a 6 by 6 matrix each. These matrices are depicted as follows:

$$\mathbf{A}\begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ a_{3,1} & a_{3,2} & 0 \end{bmatrix}, \mathbf{S}\begin{bmatrix} 1 & & \\ s_{1,2} & 1 & \\ 0 & 0 & s_{3,3} \end{bmatrix}, \text{and } \mathbf{F}\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

Unlike TSSEM, which requires subgroup analysis to test moderation, SEM parameters can be regressed on specific moderators. This method is similar to testing moderation of measurement invariance (Bauer, 2017). The regression matrix for each sample ($\mathbf{A_i}$ as nested within $\rho_R$), which includes the paths for the specified model, is a function of the values of each moderator for each sample ($\mathbf{X}_i$), the estimated sample-specific effect for each moderator ($\mathbf{A}_1$), and the intercept value when each moderator is set to zero ($\mathbf{A}_0$) as seen in (5).

$$\mathbf{A_i} = \mathbf{A}_0 + \mathbf{A}_1 \circ \mathbf{X}_i \tag{5}$$

To illustrate the matrices seen in (5), let gender/sex be introduced as a moderator (i.e., 0 = female, 1 = male) of the paths from income and education to depressive symptoms. In this example, $\mathbf{A}_0$ is the path estimates for samples composed of females whereas $\mathbf{A}_1$ represents the change in the regression coefficient for samples composed of males relative to the coefficient for females. These matrices are depicted as follows:

$$\mathbf{A}_0\begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ a_{0,3,1} & a_{0,3,2} & 0 \end{bmatrix}, \mathbf{A}_1\begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ a_{1,3,1} & a_{1,3,2} & 0 \end{bmatrix}, \text{and } \mathbf{X}_i\begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ x_i & x_i & 0 \end{bmatrix}$$

In other words, path coefficients are estimated for each sample (i.e., sample-specific parameters), sort of like multiple subgroup models, with the goal of examining if a SEM parameter with a particular value of a moderator varies (in direcction or

magnitude) from other values of the moderator. When moderators are included, the vector of deviations of each sample ($\tau_i^2$) is the left-over, or residual, variability unaccounted for by the moderator(s) included. Therefore, the $\tau^2$ of a model with moderators and without moderators can be used to compute the amount of variability between SEM parameters that is explained by the moderator(s), $R^2$. Jak & Cheung (2019) recommend scaling or centering continuous variables for stability in estimates. Taken together, the equation for the complete one-stage MASEM, with moderators included, is showin in (6).

$$r_i = \text{vechs}(\mathbf{F}(\mathbf{I} - (\mathbf{A}_0 + \mathbf{A}_1 \circ \mathbf{X}_i))^{-1}\mathbf{S}(\mathbf{I} - (\mathbf{A}_0 + \mathbf{A}_1 \circ \mathbf{X}_i))^{-1\mathrm{T}}\mathbf{F}^{\mathrm{T}}) + u_i + e_i \quad (6)$$

To construct the sample-specific correlation matrices, I extracted correlations between each observed variable. I extracted these correlation matrices separately for different developmental periods, females and males, and racial/ethnic groups so that I could test these associations within specific samples rather than relying on the percentage of a particular sample (e.g., percent Black, percent Latinx) like meta-analyses that use aggregate data (see Korous et al., 2021) and test the contribution of each moderator over and above the other. Therefore, there were more samples than datasets, potentially up to 60 matrices per dataset. I extracted correlations instead of covariances because the prior are standardized, which made the effect sizes between datasets more comparable despite their differences in sampling and measurement (Borenstein et al., 2009). For instance, measures of depressive symptoms have different response scales, thus, influencing the interpretation of an increase in depressive symptoms relative to an increase in a component of SES. I centered income, years of education, and occupational status/prestige before squaring them so that the nonessential multicollinearity between the

squared and non-squared terms was reduced (J. Cohen et al., 2003). Lastly, I extracted the value of each moderator for each sample.

### *Preliminary Analyses*

Prior to the one-stage MASEM, I computed and evaluated the means and standard deviations for all variables within each dataset. I reported the number of participants that fell within a particular developmental period and the proportion of females and racial/ethnic groups in each dataset. I also examined histograms for income, education, and occupational status/prestige to assess the range of their distribution, that is, whether there was evidence of a restriction of range. Related to the extracted correlations, I examined the distribution of correlations across samples as a visual exploration of heterogeneity. For instance, I examined the distribution of the correlations between income and depressive symptoms (e.g., minimum and maximum effect size value).

Moreover, there are several methodological characteristics across samples that may increase the heterogeneity between correlations including the different measures of depressive symptoms, different measures of academic achievement, and year of data collection. As noted earlier, a large amount of heterogeneity can limit the generalizability of an estimated path model. However, one-stage MASEM was not designed for exploratory analyses of moderators because the number of unique elements can quickly exceed that number of samples included, which can interfere with convergence (Jak & Cheung, 2019). Therefore, Jak & Cheung (2019) suggest testing moderators that are specific to the research questions. For this reason, I did not include methodological characteristics as moderators of the SEM parameters because the present study's focus was on differences in developmental period, gender/sex, and race/ethnicity. Nonetheless,

I examined differences in the correlations between samples prior to estimating a one-stage MASEM. For example, I examined if the correlation between income and depressive symptoms significantly varied between studies given the measure of depressive symptoms (e.g., CESD compared to BPI). To do this, I conducted a traditional mixed-effects meta-analysis using the metaSEM package (Cheung, 2015b), which is a SEM-based meta-analysis as described above (i.e., different from a one-stage metaSEM). I included the type of depressive symptom measure, type of academic achievement measure, and year of data collection as predictors (moderators) of the effect size. For these analyses, I transformed correlations from r to Fisher's Z before meta-analyzing them (Borenstein et al., 2009).

In my pre-registration, I noted that I would restrict the one-stage MASEM to datasets that used a version of the CESD if there was evidence that the correlations between a component of SES and depressive symptoms significantly varied across measures of depressive symptoms. This decision increases the comparability between effect sizes and decreases the heterogeneity in the SEM parameters. However, I did not restrict analyses to one particular measure of academic achievement even if the type of academic achievement measure was a significant moderator because there were fewer samples that included academic achievement. Thus, limiting to one specific measure of academic achievement measure would significantly reduce the amount of information to estimate SEM parameters, which could produce errors in estimating $\tau^2$. Nonetheless, I consider these differences in my interpretation of the findings. Finally, for correlations that significantly varied by the year of data collection, the year of data collection was considered as a potential moderator of the SEM parameters in the one-stage MASEM, but

it was not tested as the focus of moderation was on the developmental period, gender/sex, and race/ethnicity.

***Research Question #1***

To address my first research question, I defined two models (see Figure 3). In Model 1, I regressed depressive symptoms and academic achievement on income, years of education, and occupational status/prestige. I included occupational status and prestige in separate models. In Model 2, I included the same pathways as specified in Model 1, but I also regressed depressive symptoms and academic achievement on the quadratic terms for income, years of education, and occupational status/prestige. Although I extracted correlations with the squared terms, which is a linear relation, they form a quadratic equation by combining the linear and quadratic association to predict the outcome (see J. Cohen et al., 2003). In both models, I included prior time points of depressive symptoms and academic achievement. To calculate the sample size for each correlation matrix, which is used in the one-stage MASEM, I averaged across the sample sizes of each correlation.

To test hypothesis #1, I evaluated support for Model 2 by examining the change in $R^2$ for depressive symptoms and academic achievement between Model 1 (linear terms only) and Model 2 (linear and quadratic terms). I used the formula shown in (7) to calculate $R^2$ (Cohen et al., 2003).

$$\sum \beta_i r_{Yi} \tag{7}$$

To illustrate, $R^2$ for depressive symptoms was calculated by summing the multiplication of the beta weight for each predictor of depressive symptoms (i.e., income, years of education, occupational status/prestige, prior wave of depressive symptoms; $\beta_i$)

and the correlation between depressive symptoms and the predictor ($r_{Yi}$). To evaluate the difference between the $R^2$ of Model 1 and Model 2, I calculated their difference and computed a 95% confidence interval (CI) for the difference. The CI of the difference was calculated by taking the square root of the sum of the standard errors squared ($SE^2$) of each $R^2$ and multiplying the value by two (Cohen et al., 2003). The $SE^2$ for each $R^2$ was estimated using the equation in (8) where *n* represents sample size and *k* represents the number of predictors. I calculated *n* by computing the harmonic mean across datasets.

$$SE_{R^2}^2 = \frac{4R^2(1-R^2)^2(n-k-1)^2}{(n^2-1)(n+3)} \quad (8)$$

Evidence of a significant $R^2$ difference at the .05 level is present when the CI does not overlap with zero. A significant difference suggests that including the quadratic terms increases the amount of variability explained in depressive symptoms and academic achievement over and above the liner effects, thus, providing compelling support for the nonmonotonic model of SES, or better is somewhere in the middle. Of note, calculating $R^2$ and their SE is experimental for two reasons. First, the beta coefficient and correlation used to calculate $R^2$ are assumed to be fixed estimates, that is, the heterogeneity is not taken into account. Second, the sample size (*n*) is based on the harmonic mean across datasets because each correlation matrix included had a different sample size. Therefore, $R^2$ could be under/over-estimated.

***Research question #2***

To test the moderating role of developmental period, gender/sex, and race/ethnicity, I regressed the SEM parameters computed from model two on each moderator. A potential advantage of this method is that each moderator is estimated while controlling for the other moderators, which was my initial aim. I used the chi-square test

in the metaSEM package to assess if the model with moderators significantly explains the variability in SEM parameters between samples and I reported the amount of variability explained between correlations ($R^2$; Jak & Cheung, 2019). The regression parameters of the moderators indicated how large the difference is between the levels of each moderator compared to the reference category.

CHAPTER 5

# Results

## Study Selection and IPD Obtained

Of the 127 ICPSR datasets evaluated for inclusion, 24 were inaccessible because they were restricted access, were not included in the ICPSR download, or were not formatted for analyses (Figure 4). Of the remaining 103 datasets, 44 were excluded because they were either not nationally representative, did not include self-reported race/ethnicity, were duplicate datasets (i.e., secondary analysis of an existing dataset that was also included), included skip-logic in the measure of depressive symptoms, or did not include a codable form of income, education, or occupation. For the analyses reported below, I included 59 ICPSR datasets, which represents 23 independent studies (e.g., National Longitudinal Study of Adolescent to Adult Health) and 1,844,577 participants. Because some of the 59 ICPSR datasets included more than one wave of data collection, different cohorts, or included respondent and spouse datasets separately, I extracted data from 135 IPD datasets.

## Descriptive Characteristics

I report descriptive characteristics specific to each level of analysis. First, I report a summary of the characteristics within each of the 135 IPD datasets. Second, I report a summary of the descriptive characteristics of the aggregate information extracted. A breakdown of characteristics for each of the 59 ICPSR datasets, summarized across waves or respondents, is shown in Table 1. The characteristics summarized below are specific to the 135 individual IPD datasets, hereto referred to as datasets.

### *IPD Characteristics*

There was, on average, 13,664 participants per dataset (range = 799 – 50,111). The average age across participants and datasets was 38.05 years (range of mean age = 6.91 – 77.91) while the youngest age included was 7 years and the maximum age was 109 years. Among these participants, 1.0% were children (18,760; 5 -11 years old), 12.6% were adolescents (232,406; 12-17 years old), 20.0% were young adults (369,575; 18-25 years old), 51.1% were adults (942,170; 26-64 years old), and 15.3% were older adults (281,666; 65 years and older). In total, there were more female than male participants, 56.3% (1,038,250) and 43.7% (80,6327), respectively. There were also more White participants (64.2%; 1,184,924) relative to Black (15.6%; 288,042), Latinx (15.0%; 276,056), Asian American (2.5%; 45,825), Native American (0.8%; 15,501) and Multiracial (1.9%; 34,229) participants.

Nearly all datasets included income, with the exception of one. The average yearly income across participants and datasets was $44,145.25 (range of mean income = $11,217.00 – $88,533.85) while the lowest income reported was -$9,998 and the highest was $6,530,000.00. There was no evidence of a restricted range towards the lower end of the income distribution as 10 datasets included some participants with a yearly income less than $10,000 and all datasets included some participants with less than $20,000. In contrast, some datasets had a restricted range towards the upper end of the income distribution. The American Trends Panel reported that higher income families had annual incomes of $120,400 or more in 2018 (Horowitz et al., 2020); 56 datasets had yearly incomes lower than $120,000. These datasets were flagged and the restriction of range was tested as a moderator of the correlation between income and depressive symptoms

and academic achievement. There was evidence that some datasets may have non-normal distributions of income as the skewness across datasets ranged from -1.87 to 64.62 and the kurtosis across datasets ranged from -1.52 to 5,341.57.

Years of education was included in 122 of the 135 datasets. The average year of education across participants and datasets was 13 years (range of mean years of education = 10 – 15 years) while the lowest years of education reported was 0 (e.g., no formal schooling) and the highest was 25 (e.g., doctoral degree). There was no evidence of a restricted range towards the lower end of the education distribution as all datasets included some participants with less than twelve years of education (e.g., less than a high school degree). In contrast, some datasets had a restricted range towards the upper end of the education distribution. Seventeen datasets categorized participants with a bachelor's degree or more (i.e., 16 years) whereas the remaining datasets included years beyond a bachelor's degree (e.g., master's degree or 18 years). These 17 datasets were flagged and the restriction of range was tested as a moderator of the correlation between years of education and depressive symptoms and academic achievement. There was evidence that some datasets had a negatively skewed distribution of education, but not positively skewed, as the skewness across datasets ranged from -1.43 to 0.96, and there was also evidence of kurtosis across datasets as values ranged from -0.95 to 3.54.

Compared to income and years of education, fewer datasets (61 out of 135) included a detailed measure of occupation. I consider this lower number of datasets in my interpretations for specific subgroups. The average occupational status and prestige score across participants and datasets was 51.72 for status (range of mean status = 25.38 – 64.68) and 43.86 for prestige (rang of mean prestige = 32.26 – 51.32). The lowest status

and prestige of participants were 1.0 and 17.0 (e.g., dishwashers), respectively, and the highest were 100 and 94 (e.g., engineers, physicians), respectively. There was no clear evidence of a restricted range for the distributions of status and prestige because all datasets included some participants with occupation scores near the lowest (i.e., 0) and highest (i.e., 100) ends. Therefore, I did not examine a restriction of range for occupational status or prestige as a moderator. There was evidence that some datasets had a positively skewed distribution of status and prestige, but not negatively skewed, as the skewness across datasets ranged from -0.63 to 1.14 and -0.10 to 1.33, respectively. There was less evidence of kurtotic distributions across datasets as values ranged from -1.32 to 1.21 for status and -0.94 to 2.51 for prestige.

Most datasets (123 out of 135) included depressive symptoms. The 12 datasets without depressive symptoms were from the National Survey on Drug Use and Health Study, which included younger participants that provided data on academic achievement, but not depressive symptoms (the 12 datasets), and older participants that provided data on depressive symptoms, but not academic achievement. I do not report the mean of depressive symptoms across participants and datasets because the measures included used different response scales. There was evidence that some datasets had a positively skewed distribution of depressive symptoms, but not negatively skewed, as the skewness across datasets ranged from 0.13 to 2.52, and there was also evidence of kurtosis across datasets as values ranged from 0.30 to 7.88.

Fewer datasets included measures of depressive symptoms and academic achievement as only 32 (out of 135) had codable achievement measures that were either self-report, parent-report, or derived from school transcripts (i.e., GPA and/or grades).

The average academic achievement across participants and datasets was 2.94 (range of mean academic achievement = 2.56 – 3.39). The lowest academic achievement score was 0.0 and the highest was 4.70. There was evidence that some datasets had a negatively skewed distribution of achievement, but not positively skewed, as the skewness across datasets ranged from -1.45 to -0.29, and there was also evidence of kurtosis across datasets as values ranged from -0.65 to 5.21.

***Aggregate Characteristics***

I extracted 2,738 correlation matrices. On average, there were 20 correlation matrices per dataset (range number of matrices: 6 – 36). Of these, 114 were for children, 407 for adolescents, 661 for young adults, 933 for adults, and 623 for older adults. There were slightly more correlation matrices for females (1,395) compared to males (1,343). There were also relatively more correlation matrices for White (608) compared to Black (597), Latinx (568), Native American (315), Asian American (278), and Multiracial (372) participants. A breakdown of the number of correlation matrices per developmental period, gender/sex, and race/ethnicity is shown in Table 2.

The number of extracted correlations per pair of variables ranged from 191 to 2,717 (mean number of correlations = 1,023). The sample size of each correlation ranged from 3 to 15,420 participants (mean sample size per correlation = 274). In Table 3, I report the unweighted mean and range of correlations for each correlation extracted across all datasets. Focusing on the main associations of this study, the distribution of correlations between individual components of SES and depressive symptoms ranged from -1.0 to .99 with a peak in the distributions between -.25 and 0 (Figure 5). The distribution of correlations between individual components of SES and academic

achievement also ranged from -1.0 to 1.0 with a peak in the distribution between and 0 to .25. I meta-analyzed these correlations in the sections below.

**Preliminary Analyses**

The goal of the following preliminary analyses was to determine if the measure of depressive symptoms, measure of academic achievement, year of data collection, or a restriction of range moderated the correlation between individual components of SES, depressive symptoms, and academic achievement. I specified a three-level meta-analysis for each moderation to model the dependencies between effect sizes extracted from the same dataset with sampling variability at level-one, correlations at level-two, and dataset at level-three (see Cheung, 2014).

For moderation by the measures of depressive symptoms, I specified the CESD as the reference group. I found significant variation between measures of depressive symptoms for all individual components of SES. Specifically, the correlations between income and depressive symptoms were more often smaller for the BPI (slope = 0.04, $p$ = .007) and MHI5 (slope = 0.06, $p$ < .001), and more often larger for the SF36 (slope = -0.04, $p$ = .030), than the CESD. The correlations between years of education and depressive symptoms were also more often smaller for the MHI5 (slope = 0.06, $p$ < .001), in addition to the K6 (slope = 0.06, $p$ < .001), compared the CESD. The PHQ9 and SF36 were not included in datasets that also included occupation. Of the included measures, the correlations between occupational status and depressive symptoms, as well as between occupational prestige and depressive symptoms, were more often smaller for the BPI (slope for occupational status = 0.04, $p$ = .001; slope for occupational prestige = 0.03, $p$ =

.008) and MHI5 (slope for occupational status = 0.04, $p$ = .005; slope for occupational prestige = 0.04, $p$ = .004), compared to the CESD.

For moderation by the measure of academic achievement, I specified grades as the reference group. I found significant variation between measures of academic achievement for income and years of education. Specifically, the correlations between income and academic achievement were more often smaller when GPA was reported compared to when grades were reported (slope = -0.11, $p$ < .007). The correlations between years of education and academic achievement were more often larger when both grades and GPA were reported compared to when grades were reported (slope = 0.34, $p$ < .001). I found no evidence that the correlations between occupational status and academic achievement, as well as between occupational prestige and academic achievement, significantly varied by measure.

The year of data collection ranged from 1985 to 2018. To improve model convergence and stability in the test of moderation, I standardized year of data collection. I found evidence of significant variation by year of data collection for the correlation between income and depressive symptoms, but no evidence of variation for the remaining individual components of SES. The correlation between income and depressive symptoms was smaller in datasets from more recent years compared to earlier years (slope = -0.01, $p$ = .014). I also found evidence of significant variation by year of data collection for the correlation between income and academic achievement, as well as between occupational prestige and academic achievement, but no evidence of variation for years of education or occupational status. The correlation between income and academic achievement (slope = 0.03, $p$ = .004), and occupational prestige and academic

achievement (slope = 0.04, $p$ = .004), was larger in datasets from more recent years compared to earlier years.

For moderation by restriction of range, I specified the absence of a range restriction as the reference group. Among datasets with a restriction of range for income, the correlations between income and depressive symptoms (slope = -0.03, $p$ = .002), as well as between income and academic achievement (slope = 0.06, $p$ < .001), were more often larger compared to datasets without a restriction of range. Among datasets with a restriction of range for years of education, the correlations between years of education and depressive symptoms were more often smaller compared to datasets without a restriction of range (slope = 0.05, $p$ < .001) whereas there was no evidence of a significant difference by a restriction of range for the correlations between years of education and academic achievement.

It is likely that a certain measure of depressive symptoms were included given the year of data collection, or that the measure of depressive symptoms and a restriction of range for income share variance attributed to a third dataset characteristic. To rule out the possibility that one or more of the significant moderators overlap to some extent, I included them in the same model. I found evidence of moderation by the measure of depressive symptoms, year of data collection, and range restriction for the correlations between income and depressive symptoms. I also found evidence of moderation for the measure of depressive symptoms and range restriction for the correlations between years of education and depressive symptoms. In contrast, range restriction was not a significant moderator of the correlations between income and academic achievement when it was

included in the same model as the measure of academic achievement and year of data collection.

Taken together, the preliminary analyses above suggest that the measure of depressive symptoms, measure of academic achievement, year of data collection, and range restriction influence the magnitude of the correlation between individual components of SES and depressive symptoms and academic achievement. The measure of depressive symptoms was a significant moderator across all individual components of SES even after accounting for other significant moderators. Therefore, I excluded correlations between individual components of SES and depressive symptoms if they were derived from measures other than the CESD. Although there was variance attributed to the type of achievement measure, all measures were still included. The year of data collection was also significant when accounting for other moderators, and, thus, may explain any residual variability between those parameters in Model 2, including the path from income to depressive symptoms and academic achievement, as well as the path from occupational prestige and academic achievement. Similarly, a restriction of range was a significant moderator of the correlations between income and depressive symptoms and years of education and depressive symptoms when accounting for other moderators. Therefore, a range restriction may also explain any residual variability between those parameters in Model 2.

**Research Question #1**

Based on the preliminary results above, I excluded datasets that did not use the CESD as a measure of depressive symptoms. If a dataset used a measure other than the CESD and included academic achievement, I removed correlations with depressive

symptoms in order to preserve correlations with academic achievement. There were 80 datasets (out of the 135) remaining. These 80 datasets were included in the analyses below, resulting in 1,308 12 by 12 correlation matrices. I provide an example of one of these correlation matrices in Table 4. The number of correlations per cell in the 12 by 12 correlation matrix ranged from 126 to 1,305 (Table 5). The accumulative sample size for each correlation in Table 5 ranged from 15,065 to 546,695.

I provide the implied correlation matrix, with their respective $\hat{\tau}^2$, for Model 1 separated by occupational status and occupational prestige in Table 6. The correlations between individual components of SES were between $\hat{r}$ = .23 and $\hat{r}$ = .40. The correlations between components of SES and depressive were between $\hat{r}$ = -.09 and $\hat{r}$ = -.13 and the correlations between components of SES and academic achievement were between $\hat{r}$ = .11 and $\hat{r}$ = .17. Depressive symptoms and academic achievement were negatively correlated $\hat{r}$ = -.14.

The parameter estimates for Model 1, along with the *SE*s, are shown in Table 7 and the parameters estimates are depicted in Figure 6. I found a significant linear association between individual components of SES and depressive symptoms over and above prior reports of depressive symptoms such that higher income, years of education, and occupational status/prestige were associated with fewer depressive symptoms relative to lower income, fewer years of education, and lower occupational status/prestige. The linear effects of the individual components of SES and prior reports of depressive symptoms explained 24% of the variability in depressive symptoms. I also found a significant linear association between individual components of SES and academic achievement over and above prior achievement levels such that higher income, years of

education, and occupational status/prestige were associated with greater academic achievement (i.e., higher GPA) relative to lower income, fewer years of education, and lower occupational status/prestige. The linear effects of the individual components of SES and prior achievement explained 29% of the variability in academic achievement. The path estimates in Model 1 were similar regardless if occupational status or occupational prestige were included.

I provide the implied correlation matrix, with their respective $\hat{\tau}^2$, for Model 2 separated by occupational status and occupational prestige in Table 8. The correlation between the quadratic term for income and depressive symptoms was $\hat{r}$ = -.03 whereas the correlations between the quadratic term for education and occupational status/prestige were $\hat{r}$ = .02 and $\hat{r}$ = .01/-.01, respectively. The quadratic associations with academic achievement were $\hat{r}$ = .05 for income, $\hat{r}$ = -.003/$\hat{r}$ = -.001 for education, and $\hat{r}$ = .02/.04 for occupational status/prestige.

The parameter estimates for Model 2, along with the *SE*s, are shown in Table 9 and the parameters estimates are depicted in Figure 6. The linear association between individual components of SES and depressive symptoms and academic achievement remained significant when the quadratic terms were included. In addition to the linear effects, I found significant associations with the quadratic terms. To aid in interpretations, I graphed what the significant quadratic associations may look like based on the parameter estimates (see Figure 7 and Figure 8). Income had a positive quadratic association with depressive symptoms and a negative quadratic association with academic achievement. More income was associated with a decline in depressive followed by a slight increase in symptoms at higher levels of income, whereas more

income was associated with an increase in academic achievement followed by a slight decline in achievement at higher levels of income. Years of education and occupational status/prestige also had a positive quadratic association with depressive symptoms, but I did not find evidence to support that years of education or occupational status/prestige had a quadratic association with academic achievement. Again, more years of education and higher occupational status/prestige were associated with a decline in depressive symptoms, which begins to level out at higher years of education and occupational status/prestige. The linear and quadratic effects of the individual components of SES and prior wave of each outcome explained 24% of the variability in depressive symptoms and 29% of the variability in academic achievement. The path estimates in Model 2 were similar regardless if occupational status or occupational prestige were included.

The $R^2$ for depressive symptoms and academic achievement were almost the same between Model 1 and Model 2, give or take a few decimals. The $R^2$ difference for depressive symptoms, whether occupational status or prestige was included, was .001, 95% CI [-.004, .006]. The $R^2$ difference for academic achievement, whether occupational status or prestige was included, was -.002, 95% CI [-.011, .007]. The CIs suggest that neither Model 1 or Model 2 explained variability in depressive symptoms or academic achievement better than the other.

**Research Question #2**

I aimed to test the moderating role of developmental period, gender/sex, and race/ethnicity by regressing the SEM parameters computed from Model 2 on each moderator. I specified a moderation matrix for each level of the moderator. As a result, there were nine moderation matrices including the dummy codes for adolescent, young

adult, older adult, male, Asian American, Latinx, Black, Multiracial, and Native American participants with reference groups being adult, female, and White participants. I could not get the model to converge with all moderators. Therefore, I examined each moderator separately. Also, given that the results for Model 2 with occupational status or occupational prestige were almost the same, I only examined moderation for Model 2 with occupational status.

***Moderation by Developmental Period***

The dummy codes for developmental period were regressed only on the SEM path parameters between individual components of SES and depressive symptoms because there were no children included in the analyses to compare with adolescents for academic achievement. I report the results in Table 10. The omnibus test of moderation was significant suggesting that the paths between individual components of SES and depressive symptoms were significantly different by developmental period.

The magnitude of the linear paths from income and years of education to depressive symptoms, but not between occupational status and depressive symptoms, was smaller for adolescents compared to adults. I found a smaller linear path estimate from income and occupational status to depressive symptoms for young adults compared to adults, but not for years of education. For older adults, the linear paths between education and occupational status were not significantly different than adults, but there was a smaller linear path from income to depressive symptoms for older adults compared to adults. For the quadratic association between income and depressive symptoms, adults had a larger association compared to adolescents, young adults, and older adults (Figure 9). The quadratic path from education to depressive symptoms was in the opposite

direction for adolescents and young adults compared to adults, but a larger quadratic association was found for older adults. I did not find evidence that the quadratic path between occupational status and depressive symptoms varied between adolescents, young adults and adults. However, the quadratic association was smaller and in the opposite direction for older adults compared to adults. The amount of variability explained between correlations ranged from 6% to 29%.

### *Moderation by Gender/Sex*

I report the results of moderation by gender/sex in Table 11. The omnibus test of moderation was not significant suggesting that the paths between individual components of SES and depressive symptoms were not significantly different between females and males. Indeed, there were no significant differences between females and males in any of the linear or quadratic paths.

### *Moderation by Race/Ethnicity*

The moderation model by race/ethnicity would not converge. For this reason, I estimated the paths in Model 2 separately for Asian American, Black, Latinx, Multiracial, Native American, and White samples. I present their parameter estimates in Table 12 for depressive symptoms and Table 13 for academic achievement. In general, there was observable variability in the magnitude of associations between individual components of SES and depressive symptoms and academic achievement. I found that for some samples there is a linear association, but no quadratic, and that for other samples there are no linear or quadratic associations. The variability in the degree of curvilinearity in association between income and depressive symptoms, and years of education and depressive symptoms, across samples is shown in Figure 10. Notably, I found no

evidence of a quadratic association between occupational status and depressive symptoms when the associations were disaggregated by race/ethnicity. Below I discuss the results for each racial/ethnic sample in alphabetical order.

**Asian American Samples.** I did not identify any correlations between depressive symptoms and academic achievement among Asian American samples. Therefore, I estimated Model 2 in two separate models, one with depressive symptoms and the other with academic achievement. I found a significant linear association between income and depressive symptoms, as well as between occupational status and depressive symptoms, but no evidence to support a quadratic association. More income and higher occupational status were associated with a decrease in depressive symptoms. In contrast, there was no evidence of a linear or quadratic association between years of education and depressive symptoms. I also found a significant linear association between income and academic achievement, but no evidence to support a quadratic association. More income was associated with an increase in academic achievement. There was no evidence of a linear or quadratic association between years of education and academic achievement nor between occupational status and academic achievement.

**Black Samples.** Among Black samples, I found a significant linear and quadratic association between income and depressive symptoms, and between years of education and depressive symptoms. The quadratic association between income and depressive symptoms suggests that as income increases there is a decrease in depressive symptoms followed by a slight increase in depressive symptoms at higher levels of income (Figure 10). For years of education, the quadratic association with depressive symptoms is less curved, suggesting that as years of education increases there is a decrease in depressive

symptoms, which begins to level out at higher years of education. There was no evidence of a linear or quadratic association between occupational status and depressive symptoms. I also found a linear association between years of education and academic achievement, but no evidence to support a quadratic association. More years of education was associated with an increase in academic achievement. There was no evidence of a linear or quadratic association between income and academic achievement nor between occupational status and academic achievement.

**Latinx Samples.** Among Latinx samples, I found a significant linear and quadratic association between income and depressive symptoms, and between years of education and depressive symptoms. The quadratic association between income and depressive symptoms suggests that as income increases there is a decrease in depressive symptoms followed by a slight increase in depressive symptoms at higher levels of income (Figure 10). For years of education, the quadratic association with depressive symptoms was negative, suggesting that as years of education increases there is a slight increase in depressive symptoms followed by a decrease in depressive symptoms at higher years of education. There was a significant linear association between occupational status and depressive symptoms, but no evidence to support a quadratic association. A higher occupational status was associated with a decrease in depressive symptoms. I also found a significant linear association between income and academic achievement, but no evidence to support a quadratic association. More income was associated with an increase in academic achievement. There was no evidence of a linear or quadratic association between years of education and academic achievement nor between occupational status and academic achievement.

**Multiracial Samples.** Among multiracial samples, I found significant linear associations between income and depressive symptoms, years of education and depressive symptoms, and occupational status and depressive symptoms. More income, more years of education, and higher occupational status was associated with a decrease in depressive symptoms. In contrast, there was no evidence to support a quadratic association between any of the individual components of SES and depressive symptoms. I also found significant a linear association between income and academic achievement, years of education and academic achievement, and occupational status and academic achievement. More income, more years of education, and higher occupational status was associated with an increase in academic achievement. There was no evidence to support a quadratic association between any of the individual components of SES and academic achievement.

**Native American Samples.** Among Native American samples, I found a significant linear association between income and depressive symptoms, as well as between occupational status and depressive symptoms, but no evidence to support a quadratic association. More income and higher occupational status were associated with a decrease in depressive symptoms. In contrast, there was no evidence of a linear or quadratic association between years of education and depressive symptoms. There was also no evidence to support a linear or quadratic association between any of the individual components of SES and academic achievement.

**White Samples.** Among White samples, I found a significant linear and quadratic association between income and depressive symptoms, and between years of education and depressive symptoms. The quadratic association between income and depressive

symptoms suggests that as income increases there is a decrease in depressive symptoms followed by a slight increase in depressive symptoms at higher levels of income (Figure 10). The quadratic association between years of education and depressive symptoms followed a similar pattern. There was a significant linear association between occupational status and depressive symptoms, but no evidence to support a quadratic association. A higher occupational status was associated with a decrease in depressive symptoms. I also found a significant linear and quadratic association between income and academic achievement. The quadratic association between income and academic achievement was negative suggesting that as income increases there is an increase in academic achievement followed by a slight decrease at higher levels of income (Figure 11). For years of education, there was a significant linear association with academic achievement, but no evidence of a quadratic association. More years of education was associated with an increase in academic achievement. Finally, there was no evidence of a linear or quadratic association between occupational status and academic achievement.

CHAPTER 6

# Discussion

The aim of this dissertation was to compare two conceptual models of SES: more is always better versus better is somewhere in the middle. Towards this aim, I examined two research question. First, does a nonmonotonic model (quadratic; better is somewhere in the middle) of the relations between components of SES, depressive symptoms, and academic achievement fit better than a monotonic model (linear; more is always better)? Second, does the magnitude of these relations vary between developmental periods, males and females, and racial/ethnic samples? The results presented offer compelling evidence for these two questions because they were informed by a meta-analysis of 1,308 correlation matrices extracted from 80 nationally representative participant-level datasets. Therefore, these estimates are more precise than any single dataset alone. Furthermore, the results presented elucidate the extent to which these relations vary across the lifespan and populations, a task that would be financially and logistically burdensome to accomplish with a single study.

For my first research question, I hypothesized that there would be more support for a path model that included linear *and* quadratic associations compared to a path model that included linear associations only. I did not find sufficient evidence to convincingly suggest one model over the other because the amount of variance explained in depressive symptoms and academic achievement was similar between the two models. Nonetheless, there were significant quadratic associations between each individual component of SES and depressive symptoms, as well as between income and academic achievement. This finding substantiates the inclusion of quadratic associations in model-based tests of SES.

Given this evidence, it may be sufficient to only include linear associations if the goal is to explain or parse out the variability attributed to the three components of SES. On the other hand, future studies focused on identifying the pathways of SES should consider examining quadratic associations, or other nonlinear models, in addition to linear ones.

For my second research question, I explored moderation and found evidence that the patterns of association varied by developmental period and race/ethnicity, but was similar between females and males. The linear associations with depressive symptoms were consistently larger for adults compared to adolescents and young adults whereas the magnitude and direction of the developmental differences for the quadratic associations varied across the components of SES. When I disaggregated the results for specific racial/ethnic samples, there was evidence of a linear and quadratic association with depressive symptoms for Black, Latinx, and White samples whereas there were only linear associations for Asian American, Multiracial, and Native American samples. For academic achievement these relations were linear, except among White samples. This evidence corroborates theory on the diverse pathways of development (Causadias, 2013; Cicchetti & Rogosch, 1996; García Coll et al., 1996; R. M. B. White et al., 2018), indicating that SES does not necessarily have the same effect on all children and families.

Overall, the findings from the current study substantially contribute to theory and practice. Specifically, this evidence supports three propositions: (1) more is not always better and (2) there are unique contexts and resources associated with different levels of SES that (3) operate in a dynamic fashion with other cultural systems (e.g., racism) that ultimately affect the integrated actions between the individual and context. In the following sections I integrate these propositions with the findings from the current study.

Then, I discuss the contributions of these findings to understanding measurement and, afterwards, outline key limitations that can be addressed in future research.

**Sometimes Better is Somewhere in the Middle**

The more is always better model of SES does not adequately account for the variation in human development across levels of SES. Prior work focused on youth from higher SES backgrounds in high achieving schools defends this assertation (e.g., Luthar, Kumar, et al., 2020), which is complemented by a long history of scholarship on the benefits associated with higher SES and the costs associated with lower SES (e.g., Bradley, 2018; Bradley & Corwyn, 2002). The current study makes a substantial contribution to this literature by bridging these two lines of inquiry. The results suggest that there is elevated risk for depressive symptoms associated with lower *and* higher levels of SES and a greater promotion of academic achievement for levels of SES somewhere in the middle. Therefore, the risk associated with SES is not directly attributed to the level of SES, but to the bioecological contexts afforded by the cultural values ascribed to a component of SES (Figure 1). It is the integrated interactions between the individual and aspects of these SES-stratified contexts that lead to particular developmental pathways.

Moving forward, theorizations linking SES to human development need to incorporate the unique contexts and resources that facilitate or hinder proximal processes and maintain normative developmental trajectories. The cultural values ascribed to social and economic symbols, either independently or in combination, stratify individuals and families into contexts that share a common level of SES such as neighborhoods (Leventhal, 2018), schools (Marcotte & Dalane, 2019; Roscigno, 1998), and social

networks (Burt, 2000; Cao & Smith, 2020). These contexts combine and interact in ways that affect proximal processes beyond what occurs within the family system (Eamon, 2001; Huston & Bentley, 2010). These physical, social, and cultural contexts also grant or constrain access to specific resources (Bradley, 2018; Kraus & Park, 2017). In conjunction with other cultural systems, like racism, these resources are differentially allocated between and within levels of SES for populations who experience marginalization (Causadias & Umaña-Taylor, 2018; Henry et al., 2019). Therefore, research disentangling the effects of SES has a promising future in the social sciences.

Scholars interested in the developmental pathways associated with SES can unpack the promotive factors (advantages) and risk factors (disadvantages) within contexts correlated with SES that may accumulate over time or compensate and negate one another (Huston & Bentley, 2010; Sroufe, 1997). Are there particular places, practices, and resources shared across middle to higher levels of SES that act as promotive factors for normative developmental trajectories? Are there unique or shared places, practices, and resources between lower and higher SES that act as risk factors for developmental deviations? In what follows, I theorize potential aspects of the bioecological context and resources that relate specifically to academic achievement and depressive symptoms based on the associations substantiated in the current study.

The documented associations with academic achievement offer insight into how unique contexts and resources increase the likelihood of maintaining normative trajectories of development. These associations were mostly linear, suggesting that an increase in SES is a promotive factor. Congruent with prior work (e.g., Harwell et al., 2017; Sirin, 2005), the linear associations suggest that youth from lower SES

backgrounds generally have lower academic achievement compared to those from middle to higher SES backgrounds. This effect was slightly larger for income and years of education, as well as more consistent across racial/ethnic samples, compared to occupational status and prestige. Therefore, it is necessary for future research to focus on the contexts and resources (or unequal distribution of resources) associated with lower income and years of education that may be shared across racial/ethnic populations and hinder the proximal processes that deter from pathways of reaching one's full achievement potential (Korous et al., 2021). For instance, cognitive stimulation has been consistently linked to competence across cultures and stimulation materials have been frequently associated with components of SES, namely, family income and parental years of education (Bradley & Corwyn, 2005). This avenue of inquiry can offer recommendations for policy makers given its potential widespread application across diverse populations.

Several variables integrated from multiple levels of analysis can be useful to further advance understanding of the proximal processes linking SES to academic achievement. Income and years of education were the two strongest predictors, which is consistent with prior literature (e.g., Reardon, 2011). On the other hand, occupational status/prestige had weaker associations that were not present among most racial/ethnic samples. This latter finding contributes to the mixed literature comparing effect sizes between components of SES and academic achievement with some showing associations of similar or larger/smaller magnitude for occupational status/prestige (Bradley, 2016; DeGarmo et al., 1999; Harwell et al., 2017; Sirin, 2005). It is possible that the association was smaller in the current study because all three components were included in the same

model. Nonetheless, occupational status/prestige explained some variability unaccounted for by income and years of education. Based on these findings, what does greater household or parental income and parental years of education at the individual level afford families?

Higher income, relative to lower income, allows parents to select the type of environments to raise their children in, such as higher quality schools (Marcotte & Dalane, 2019), and to protect their children from environmental hazards (e.g., noise, pollution, violence) that can interfere with learning, memory, and adaptive behaviors (Bradley, 2016; Evans et al., 2005). Income also provides parents more financial resources to invest in learning and stimulation materials, specialized instruction, and advanced placement beyond the financial resources needed for basic necessities (Bradley et al., 2001; Duncan et al., 2017). Indeed, families with higher income have been able to spend more on childcare and stimulation materials than families with lower income (Kornrich, 2016). This investment fosters proximal processes that facilitate individual organization in ways that increase the probability of succeeding in school (e.g., cognitive ability, school readiness; Duncan et al., 2007; Rosen et al., 2020). There may also be a limit to the extent that greater investment leads to a subsequent increase in academic achievement as indicated by a curvilinear association with income. I discuss this quadratic association later on because the effect was likely specific to White samples. To compliment the above findings, a future study can assess how much investment is sufficient for promoting average levels of achievement and subsequent success. In turn, such evidence can provide budget considerations for programs that provide supplemental income (e.g., West et al., 2021).

Notwithstanding the relation between income and academic achievement, parental education also plays a role, either independent or in combination with income. In general, income and years of education are moderately correlated, which is confirmed by the medium to large model-implied correlations in this study (Funder & Ozer, 2019). For this reason, the type of investments afforded by greater financial resources may vary given the parent's own educational attainment and this interaction may have a different association with academic achievement. For instance, parental involvement and expectations contribute to academic achievement (Benner et al., 2016; Pinquart & Ebeling, 2020), across racial/ethnic populations (Jeynes, 2007), and these promotive factors are associated with higher levels of parental education even in families with lower income (Davis-Kean, 2005; Guryan et al., 2008; Kornrich & Rodriguez, 2016).

There has been a rise in parental involvement over the years mostly by mothers, but also increasingly by fathers, and this increase has been larger for parents with a college degree (Bianchi, 2000; Ramey & Ramey, 2010; Schneider et al., 2018). Ramey and Ramey (2010) attributed this growth to the increase in competition for college admission and that higher educational attainment provides parents an advantage of preparing their children for college relative to parents without a college degree. Indeed, parents from higher SES backgrounds tend to focus more on children activities directed at preparing them for college (Cheadle & Amato, 2011) Therefore, formal education affords parents with intangible resources (i.e., human, social, and cultural capital) to participate in their children's activities and know which types of investments to make.

The dynamic combination of income and years of education may also afford a greater cultural match. This interpretation is one example of the way cultural systems

(Causadias, 2020) impact how the same context or resource lead to different proximal processes given a specific level of SES. Specifically, contexts afforded by middle to higher levels of SES provide youth stability and choice beyond worrying over making ends meet (Stephens, Markus, et al., 2014). This stability and choice allow for more opportunities to participate in proximal processes that are conducive to academic achievement. Additionally, universities emphasize norms of independence (e.g., pursuing one's interests), which can make first-generation students feel uncomfortable and perceive greater difficulty in completing course requirements (Stephens, Fryberg, Markus, et al., 2012). Student's from lower SES backgrounds are also less likely to know the rules for interacting in middle to higher SES contexts (Ridgeway & Fiske, 2012). Therefore, their interactions with educational institutions, such as universities, are qualitatively different compared to students from middle to higher SES. Prior interventions show that changing perceptions of norms within universities can increase first-generation student's achievement in college settings (Stephens, Fryberg, Markus, et al., 2012; Townsend et al., 2021). Future work along these lines can examine these potential benefits among high school students.

Overall, the findings of the current study contribute to the accumulating body of research on the intergenerational transmission of SES. The United States has the one of the highest levels of income inequality compared to other industrialized democracies (OECD, 2020), which is directly associated with lower social mobility (Corak, 2013). Thus, a parent's financial earnings are related to their child's earnings in adulthood. In fact, the correlation between a parent's SES background and their children's educational, occupational, and financial success is nearly as large in magnitude as the association

between a child's intelligence and their SES in adulthood (Strenze, 2007). The relation between parental SES and their children's academic achievement explains part of this connection (Carvalho, 2012; Surachman et al., 2019). High school students who have a lower GPA and perform more poorly on achievement tests are more likely to have a lower GPA in the first year of college, which is related to dropping out of college in the following years (Westrick et al., 2015). Because universities mediate access to resources, social networks, and socioeconomic opportunities (Ridgeway & Fiske, 2012; Stephens, Markus, et al., 2014), failure in college will have negative repercussions youth's socioeconomic success in adulthood.

The associations with depressive symptoms offer insight into how unique contexts and resources contribute to developmental deviations. Congruent with prior work (e.g., Letourneau et al., 2011; Lorant et al., 2003), the linear associations suggest that youth from lower SES backgrounds generally have more depressive symptoms compared to those from middle to higher SES backgrounds. This effect was slightly larger for income and years of education compared to occupational status and prestige. An overall approach to addressing the risk factors associated with lower SES may not be sufficient because these associations were generally larger for adult samples, compared to adolescents, and varied between racial/ethnic populations. Instead, it is necessary for future research to elucidate the contexts and resources (or unequal distribution of resources) associated with lower SES in specific populations that affect proximal processes and lead to deviations from normative developmental trajectories. This avenue of inquiry can offer recommendations for policy makers to more efficiently allocate resources to improve overall well-being in the United States. Examining the contribution of variables

integrated from multiple levels of analysis can be useful to further advance understanding in this regard. However, attention also needs to be given to risk factors across the distribution of SES, namely, those associated with higher levels of SES.

Despite the general evidence that depressive symptoms decrease as SES increases, higher SES was also associated with a subtle elevated risk compared to levels of SES somewhere in the middle. This finding is consistent with the literature (Luthar et al., 2013; Luthar, Kumar, et al., 2020). A next step for future research is to compare the proximal processes between different levels of SES and the contexts and resources that affect them. Are there shared contexts or resources between lower and higher levels of SES that contribute to elevated risk or are these contexts and resources unique to each level?

Prior research has documented some risk factors shared between youth from lower and higher SES backgrounds (Luthar & Latendresse, 2005a). For instance, reports of lower parental closeness and fewer dinners with at least one parent were similar across students attending lower and higher income schools, which was associated with an increased risk for internalizing and externalizing problems for both groups of students (Luthar & Latendresse, 2005b). It could be that parents from lower and higher SES backgrounds work long hours, thus, involuntarily unavailable for dinner. However, additional research is needed to explain the scenario in which at least one parent is home and there are still fewer dinners together. Luthar and Latendresse (2005) suggested that it was not the presence of family dinners that served as a protective factor, but that the absence of family dinners increased vulnerability during an age when children need guidance to adapt to developmental-specific challenges. Adverse childhood experiences

(e.g., parental depression, abuse) are also a shared risk factor because they are associated with lower SES (Walsh et al., 2019) and are also experienced by higher SES populations, which increase their probability of being diagnosed with clinical disorders such as depression (Luthar et al., 2021). Identifying additional shared risk factors may further advance general contributors to the continuity and discontinuity of pathways that lead to depressive symptoms.

Similar and divergent risk factors can be established by attending to the difference in curvature found in this study between components of SES. The magnitude of the quadratic association varied between income, years of education, and occupational status/prestige. Therefore, combining any of these components into an overall composite score of SES is likely to overlook the specific pathways related to each component (Korous et al., 2018). Income had a more marked increase at higher levels compared to years of education and occupational status/prestige, which displayed more of a diminished association at higher levels. In effect, the risk associated with higher levels of SES are likely specific to income.

Past research has shown that contexts characterized as higher income tend to increase risk for depressive symptoms, rather than household income, including living in higher income neighborhoods and attending high achieving schools, because they exacerbate competition to stand out (Ebbert et al., 2019; Lund & Dearing, 2012; Luthar et al., 2013). On the other end, the negative effects of low-income contexts are well-established due to their associations with, for example, instability, chaos in the home, violence, and deteriorated neighborhoods (Bradley & Whiteside-Mansell, 1997; Evans,

2004; Yoshikawa et al., 2012). Notwithstanding these disparate contexts between higher and lower levels of income, they share a common theme of risk factors: *stressors*.

The interaction between individuals and these stressors, a proximal process, gives rise to stress, which is a key contributor to depressive symptomatology (Turner & Lloyd, 1999). Although children and families from lower SES backgrounds are more likely to experience significant economic-related life events (e.g., income loss), both ends of the extremes are likely to experience some type of chronic strain (Eamon, 2001; Luthar, Kumar, et al., 2020). For example, among lower income contexts these stressors can be attributed to economic hardship (e.g., pressure to afford basic necessities) and family conflict (Conger et al., 2010; McLoyd, 1990) whereas for higher income contexts these stressors can be attributed to the relentless pressure to achieve and upward social comparisons (Luthar, Suh, et al., 2020). This existing body of knowledge and evidence from the current study is clinically relevant. Clinicians, such as school counselors, should consider evaluating frequent stressors among youth that are common experiences (e.g., adverse childhood experiences) and experiences specific to their SES backgrounds (e.g., family conflict vs. achievement expectations).

For researchers, these data outline a very important line of inquiry. That is, what exacerbates risk at both ends of SES and what will reduce these risk factors? Among low-income backgrounds, what will reduce chronic economic stain and subsequent downstream effects? One solution that deserves attention is tax credits such as the Earned Income Tax Credits, a work-based approach for supplemental income (Yoshikawa et al., 2012). Among high-income backgrounds, what will reduce the pressure to achieve? Finding balance is one solution, within the family system and within the educational

system. Prior work has shown that when students in relatively affluent schools perceive that their parents emphasize community oriented behaviors as much as excelling academically, they have higher GPAs and a lower risk for internalizing symptoms (Ciciolla et al., 2017). For all levels of income, supporting primary caregivers is a necessary direction (Luthar & Eisenberg, 2017; National Academies of Sciences, Engineering, and Medicine, 2019b). Youth from both lower and higher income backgrounds are likely to experience having a parent with depression (Conger et al., 2010; Luthar et al., 2021), which is underscored by the fact that adults in this study had the most pronounced risk for depressive symptoms at both ends of the income distribution.

Although I found significant quadratic associations with depressive symptoms for years of education and occupational prestige/status, the association was weaker at the higher ends. That is, those with higher years of education and occupational status/prestige were not a greater risk for depressive symptoms nor benefited more than those with levels somewhere in the middle. It is possible that income explained most of the variability in depressive symptoms for individuals from higher SES backgrounds. However, it is the case that parents with higher years of education are more likely to be overextended because of their involvement in their children's academic achievement and that higher status/more prestigious jobs also have high levels of stress and a greater risk of falling (Luthar, Kumar, et al., 2020; Ramey & Ramey, 2010). Future research can consider the interactions between components of SES to further unpack these associations. For instance, does more years of education offer some sort of capital that mitigate stressors associated with lower or higher levels of income?

Unpacking the contexts and resources associated with levels of SES somewhere in the middle can provide additional evidence on the promotive and risk factors associated with SES. In this study, levels of SES somewhere in the middle were consistently associated with increases in academic achievement and decreases in depressive symptoms. From this evidence, there must be something unique about the contexts and resources associated with levels of SES somewhere in the middle. Perhaps the ambitions and goals of families from levels of SES somewhere in the middle, combined with less economic hardship and uncertainty, contribute to their better well-being and academic success. Middle class families aspire to own homes, have health insurance, and save money for their children's education and their own retirement (The United States Department of Commerce, 2010). Although families from higher SES backgrounds are also less likely to experience economic hardship, having excessive amounts of income can mitigate its benefits, especially with the increased desire to achieve greater wealth and status (Kahneman & Deaton, 2010; Quoidbach et al., 2010; Wang et al., 2019). Overall, families in the middle of the SES distribution are exposed to fewer risk factors experienced by families from the extreme ends. To complement the work on the disadvantage associated with lower and high SES, future research can examine the proximal processes among youth that fall in-between. Policy makers may be able to leverage this knowledge to improve overall well-being.

The associations with academic achievement and depressive symptoms across different levels of SES support principles of equifinality and multifinality among developmental pathways. For instance, in this study lower and higher levels of SES was associated with elevated risk for the same outcome (i.e., depressive symptoms) via

different developmental pathways (i.e., equifinality; Cicchetti, 2006). However, a higher level of SES was also promotive of academic achievement. Therefore, higher levels of SES can lead to different developmental pathways and outcomes (i.e., multifinality; Cicchetti, 2006). On one hand the emphasis placed on achievement in high income contexts promotes positive academic outcomes, but on the other hand this pressure can come at a cost to one's mental health when it is overemphasized. Scholars and practitioners should consider the possibility of multifinality when developing interventions for this population. Among high income contexts it may help to maintain normative developmental trajectories by figuring out a balance between education related activities and social/leisure activities. One approach could be to alter institutional norms (e.g., universities) of independence and academic excellence (e.g., Stephens, Fryberg, Markus, et al., 2012) that may contribute to exclusionary and unethical behavior in order to stand out. Instead, these institutions can emphasis complementing academic success with building friendships and having diverse learning experiences. An approach along this line could potentially benefit students from lower income contexts as well by matching cultural norms (e.g., Stephens, Fryberg, Markus, et al., 2012) and fostering cross-class friendships (e.g., Townsend et al., 2021).

In addition to the unique contexts and proximal process associated with different levels of SES, these contexts and proximal processes vary within-levels of SES. Bioecological systems theory (Bronfenbrenner & Morris, 2006) and developmental psychopathology (Cicchetti, 2006) emphasize the importance of chronological time, suggesting that developmental period is a defining feature of the contexts associated with SES both in terms of intraindividual organization and current cultural systems. In line

with this reasoning, race/ethnicity is also a defining feature of the contexts associated with SES because cultural systems can impact the type of contexts and resources afforded to SES based on an individual's racial/ethnic position in the cultural system. For example, racism limits the financial return of higher education for racial/ethnic minorities (Darity Jr et al., 2018), thus, limiting social mobility. Unlike developmental period and race/ethnicity, gender/sex may not be an important defining feature of the contexts associated with SES, at least in terms of its association with depressive symptoms and academic achievement. Given that women systemically receive less financial return for similar years of education (Bobbitt-Zeher, 2007), gender/sex may have important implications in the association between SES and other developmental outcomes. Further, intersectionality approaches that consider the joint combination of SES, race/ethnicity, and gender/sex may identify more specific patterns of association and contexts (E. R. Cole, 2009; Henry et al., 2019). In what follows, I unpack how developmental period and race/ethnicity contribute to variability within contexts associated with SES.

**Developmental Period as a Defining Feature of the Contexts Associated with SES**

Evidence from the current study supports that the role of SES in human development is differentially emphasized across development periods. It is well understood in developmental theory, including bioecological systems and developmental psychopathology, that timing is a critical factor in the manifestation of maladjustment such as depressive symptoms (Bronfenbrenner & Morris, 2006; Cicchetti, 2006). Developmental timing is also recognized in research specific to SES and health (Bradley, 2016; Leventhal, 2018). Therefore, a particular developmental period creates a unique context within specific levels of SES.

In this study, there was a stronger linear and quadratic association between income and depressive symptoms for adults compared to adolescents, young adults, and older adults. The various types of stressors experienced within contexts related lower and higher levels of income may be accumulating over time or have some sort of latency effect. One explanation is the role of prior adaption to past stressors (Sroufe, 1990). The contexts and resources associated with varying levels of income can enhance or constrain adaptation, setting the stage for how individuals respond to future stressors. Over time, these patterns of adaptation, as influenced by the current context and availability of resources, can lead to developmental pathways that deviate from normative trajectories. The longer these pathways are followed, the harder it is return back to more adaptive pathways (Sroufe, 1997). This theorizing is justified by evidence showing that the persistence of poverty exacerbates its negative effects (Bradley & Whiteside-Mansell, 1997), as well as evidence related to cumulative disadvantage (Wickrama et al., 2009) and life course perspectives (Wadsworth, 1997). Although earlier interventions will more likely prevent depressive symptoms from originating, interventions during the transition into adulthood may prove useful for those who *slipped through the cracks*.

Longitudinal research is needed to support mental health interventions during the transition into adulthood. Some stressors within the contexts associated with lower and higher levels of income may have delayed consequences (Sroufe, 1990) or play a significant role in transitionary periods such as moving into full-time employment (Wickrama et al., 2009). Therefore, the experience of particular stressors among youth from lower and higher income households can lead to developmental deviations in adulthood. Given that SES is multi-generational (Chetty et al., 2014), this latency effect

would explain why income had a stronger influence on depressive symptoms for adults compared to adolescents and young adults. However, it does not explain the discontinuity among older adults who had a smaller association. Researchers can examine longitudinal relations to better understand the potential for a delayed onset of depressive symptoms for higher levels of SES. A future study could examine if reports of excessive pressure and social comparisons experienced in high school are related to depressive symptoms in adulthood.

It is also worth considering if an individual's subjective meaning of their SES and its centrality impact the association between income and depressive symptoms. One's perception of their socioeconomic ranking is an important aspect of their identity (Thomas & Azmitia, 2014). Individuals who experience uncertainty about their future SES also experience lower self-esteem and life satisfaction (Destin et al., 2017). The salience of status-based identity is likely to become more pronounced in the transition into adulthood, for instance at the beginning of college for students from lower SES backgrounds and towards the end of college for students from higher SES backgrounds, where expectations of social mobility, status uncertainty, and upward social comparison are exacerbated (Destin et al., 2017). One's subjective understanding of SES may also contribute to understanding its associations. Meta-analytic evidence on subjective indicators of status shows an association with physical and mental health beyond, and sometimes larger than, objective components of SES such as income (Quon & McGrath, 2014; Tan et al., 2020). Some meta-analytic evidence also suggests that the association between subjective status and mental health increases with age, but decreases with age for physical health outcomes (Zell et al., 2018). None of these meta-analyses examined

curvilinear associations with subjective SES, which is a future direction that can build on the findings of the current study.

In contrast to income, the variation between developmental periods was less consistent for years of education. The linear association for years of education was smaller for adolescents compared to adults whereas the quadratic association was in the opposite direction for adolescents compared to adults. The linear finding is consistent with literature that documents an association between years of education and depressive symptoms among adults (e.g., Lorant et al., 2003), but not between parental educational attainment and adolescent depressive symptoms (Miech et al., 1999). However, parental educational attainment has been associated with anxiety symptoms (Miech et al., 1999). Thus, the effect of lower parental SES on youth's depressive symptoms, as documented in prior work (e.g., Lemstra et al., 2008; Letourneau et al., 2011), may manifest from the dynamic interplay between multiple components of SES rather than any component individually, and that lower parental years of education may be related to developmental pathways that lead to outcomes other than depressive symptoms. Moreover, the negative quadratic association furthers this interpretation because adolescents with parents who had lower and higher years of education had a decreased risk for depressive symptoms than those somewhere in the middle. Parents may be drawing on their own cultural capital to protect their children from the potential risks associated with lower and higher levels of SES (R. M. B. White et al., 2018). This finding, nonetheless, needs to be substantiated in future research.

The quadratic association between years of education and depressive symptoms was larger for older adults compared to adults. More years of education was associated

with a steeper increase in depressive symptoms for older adults whereas for adults the association diminished at higher levels. This relation is in contrast to income in which older adults had a smaller quadratic association than adults. The mechanisms by which higher SES increases risk for older adults may be specific to years of education. Although prior work has generated evidence on the link between lower levels of educational attainment and more depressive symptoms among older adults (e.g., Luo & Waite, 2005), the increased risk for higher educational attainment has been understudied.

Older adults have generally been found to report more depressive symptoms than adults regardless of their years of education (Miech & Shanahan, 2000). In effect, it could be that some of the social capital afford by years of education is lost in older adulthood as social networks get smaller, such as the quantity and quality of relationships with friends and adult children, which are related to poorer subjective well-being and a greater feeling of loneliness in later life (Pinquart & Sörensen, 2000; Pinquart & Sörensen, 2001). Because older adults with more years of education are likely to have adult children that also have higher educational attainment, their adult children are most likely overextended in their own children's academic achievement, thus, having less time to make meaningful connections with their older parents.

The association between occupational status and depressive symptoms was generally smaller for younger populations compared to older populations. This evidence suggests that the risk associated with lower occupational status, after accounting for the variance attributed to income and years of education, must be specific to an individual's direct interaction with their occupation rather than indirectly through their parent's experience (Poulton et al., 2002). Lower status occupations may be particularly

meaningful for depressive symptoms among adults and older adults because they are associated with more occupational-related stress such as higher demands, lower control, and greater effort with less reward (Hoven et al., 2015; Link et al., 1993). If these risk factors within lower status occupations impact children, then it is likely transmitted through factors correlated with occupational status such as parental depression. I also found that the quadratic association between occupational status and depressive symptoms was in the opposite direction for older adults compared to adults, but this estimate was small in magnitude and suggests that, for the most part, there was a slightly decreased risk for depressive symptoms towards higher status occupations compared to lower and middle levels of occupational status.

Overall, there is considerable variation in the patterns of association between components of SES and depressive symptoms across developmental periods. Future research can expand on these findings by examining these patterns among children under the age of 12 and by examining associations with the trajectories of depressive symptoms. Do lower and higher levels of SES increase risk for the onset of depressive symptoms in childhood or adolescence, or does this outcome manifest more in adulthood? What contributes to the continuity or discontinuity in depressive symptoms attributed to SES? A follow-up study also needs to examine differences between children, adolescents, and young adults in the relation between individual components of SES and academic achievement because it could not be tested in the current study and the existing evidence remains unclear (Korous et al., 2021). Research on the longitudinal trajectories of components of SES, income more specifically, and their relations to depressive symptoms across the lifespan is needed. Emerging work has found that unstable income

(increases and decreases) over time is associated with a greater risk for depressive symptoms compared to stable income, regardless if it is lower or higher income (Whitfield et al., 2021).

**Race/Ethnicity as a Defining Feature of the Contexts Associated with SES**

Evidence from the current study supports that the role of SES in human development is differentially emphasized across racial/ethnic populations. Notably this is the first meta-analysis, to my knowledge, to estimate the correlation of individual components of SES with academic achievement and depressive symptoms for specific racial/ethnic samples (see Korous et al., 2018, 2021). Unpacking these differences in associations helps advance understanding of the cultural risk and promotive factors across different levels of SES that are contextually salient for specific populations (Causadias, 2013; Luthar et al., 2000). I emphasize here that it is not race or ethnicity that directly affect associations with individual of components of SES. Instead, this process of social stratification is driven by structural racism, which creates unique, nonshared contexts between and within particular levels of SES (García Coll et al., 1996). Given this supporting theory and findings from the current study, knowledge on the role of SES in human development is incomplete without consideration of the role of cultural systems in the United States, such as racism, on how they shape the meaning attributed to and experience of SES (Causadias & Cicchetti, 2018; García Coll et al., 2000; Henry et al., 2019). In the following, I discuss the linear and/or quadratic relations with SES for each racial/ethnic sample included. I end this section with a discussion of how these findings contribute to the marginalization-related diminished returns hypothesis.

### *Asian American Samples*

The relation of SES with depressive symptoms and academic achievement was linear among Asian American samples. Higher income and occupational status were associated with a decrease in depressive symptoms, suggesting that lower SES is a risk factor in this population. This association was larger for occupational status, compared to income, and the largest association between occupational status and depressive symptoms across all racial/ethnic samples. Therefore, the risk factors associated with lower occupational status contribute beyond the risk factors associated with income among Asian Americans. The lack of evidence to support elevated risk of depressive symptoms for higher levels of SES is congruent with prior work, which found lower levels of clinical problems of depression compared to national norms (Luthar et al., In press). The risk factors for depressive symptoms among Asian American students in relatively affluent, high achieving schools may be exacerbated by experiences of racial discrimination (Luthar et al., In press). Regarding years of education, this finding is consistent with past research, which reported no association between years of education and clinical levels of depression (Gavin et al., 2010). However, the extent to which there is variability in these associations within Asian Americans (e.g., Chinese Americans, Korean Americans) needs to be examined in future research (Barringer et al., 1990; Tran & Birman, 2010).

Although a past meta-analysis has reported a non-significant correlation between overall SES and academic achievement for Asian Americans (Kim et al., 2018), the current meta-analysis suggests that the magnitude of association is specific to the component of SES. Of the three components, only income was positively associated with

academic achievement. Asian American youth with from high-income households generally had higher GPAs. This is consistent with my overall interpretation that higher income affords parents greater financial resources to invest in their children's education. Interpretations of the absence of an association with years of education and occupational status should consider the lower number of correlations included in this study: 12 correlations for years of education and 12 correlations for occupational status. Nonetheless, the lack of association between parental education and academic achievement, compared to the overall model, corroborates evidence from a past research. Smaller associations have been found between parental education and performance on standardized math tests among Asian American adolescents compared to White adolescents (Assari et al., 2020a). In this study, Asian American samples also did not have the same return for higher SES as White samples.

***Black Samples***

The relation of SES with depressive symptoms and academic achievement was linear, and sometimes quadratic, among Black samples. In contrast to prior findings (Assari, 2018b; Gavin et al., 2010; McLaughlin et al., 2012), the linear relation between income and depressive symptoms was similar in magnitude between Black and White samples. However, the contradictory findings may be attributed to the measure of depressive symptoms as the aforementioned studies included clinical assessments whereas a study that measured depressive symptoms found no difference between Black and White adults (Ostrove et al., 1999).

The association between income and depressive symptoms also had a quadratic pattern among Black samples suggesting that there is a slight increase in depressive

symptoms towards higher levels of income. This result supports my overall interpretation that contexts associated with lower and higher income increase risk for depressive symptoms. Previous work echoes this finding, but only among Black participants living in mostly White areas compared to predominately Black areas (Assari, Gibbons, et al., 2018b). In addition to the risk factors specific to higher income contexts (e.g., achievement pressure), Black Americans are also exposed to additional risk factors for depressive symptoms, including racial discrimination. Experiences of racial discrimination increase in higher income contexts, especially in predominately White areas (Assari, Gibbons, et al., 2018a). Although a prior study found that experiences of racial discrimination did not explain the relation between income and depressive symptoms (Assari, Lankarani, et al., 2018), racial discrimination unequivocally impacts mental health (Williams et al., 2019).

There was also evidence of a quadratic relation between years of education and depressive symptoms among Black samples, but the pattern suggests that the association weakens towards higher levels of SES. Past studies have reported no difference in depression or depressive symptoms between Black youth with parents who had a high school degree or higher versus no high school degree (Assari et al., 2020b; Gavin et al., 2010; McLaughlin et al., 2012). Another study on Black adults found that increases in years of education was associated with decreases in depressive symptoms, but Black adult men with a high school degree or beyond had an increased risk for depressive symptoms compared to those without a high school degree (Assari, 2017a). The data from this study are more supportive of the latter findings, an increase in years of education is associated with a decrease in depressive symptoms up to a certain point

(Ostrove et al., 1999). Given that the degree of curvature was weaker for Black samples in this study, more years of education is less of a risk factor for Black samples compared to White samples. Finally, I found no association between occupational status and depressive symptoms suggesting that the risk factors of SES are related to lower and higher income contexts and fewer years of education for Black Americans, rather than occupational status.

Of the three components, only years of education was positively associated with academic achievement among Black samples. Youth with parents that had more years of education generally had higher GPAs. This finding contradicts my overall interpretation that higher income is promotive because it affords parents greater financial resources to invest in their children's education. Instead, the salient promotive factors associated with SES appear to be attributed to human capital afforded by formal education. This finding is in line with prior research showing a smaller association between family income during high school and educational attainment eight years after high school among Black youth (Bumpus et al., 2020).

The effect of parental education was slightly larger for Black samples, compared to White samples. This finding is in contrast to prior studies, which have reported smaller associations between parental education and academic achievement (Assari et al., 2019, 2020c), as well as smaller associations between overall SES and educational attainment for Black students (Battle & Lewis, 2002). The authors suggested that racism likely diminishes the promotive effects of parental education and academic achievement (Assari et al., 2020c). Thus, future research should examine how racism across multiple levels

(i.e., cultural, institutional, individual) moderates this association (for research on racism, see Neblett, 2019).

It is also likely that despite experiences of exclusion and discrimination, higher parental education provides human capital to invest in their children through involvement. Black parents are more involved in school related activities compared to White parents (Graves & Brown Wright, 2011) and Black parent's involvement at home has been associated with higher grades (Hayes, 2012). A meta-analysis also found that, among Black parents, involvement in the form of expectations or participation in school related activities was associated with higher standardized test scores and grades (Jeynes, 2016). A next step to consider for advancing knowledge on the relation between parental education and academic achievement among Black youth is to test the role of geographic location (e.g., neighborhood, region). Emerging work has shown that compared to White students higher parental education had a smaller association with academic achievement for Black students in urban schools whereas the association was similar between Black and White students in suburban schools (Assari et al., 2021).

***Latinx Samples***

The relation of SES with depressive symptoms and academic achievement was also linear, and sometimes quadratic, among Latinx samples. The association between income and depressive symptoms had a quadratic pattern suggesting that there is a slight increase in depressive symptoms towards higher levels of income. These results suggest that contexts associated with lower and higher income increase risk factors for depressive symptoms, which is consistent with my overall interpretation. This effect may be moderated by nativity status as prior work has found no association between household

income and depressive symptoms for children born outside of the United States, compared to those born in the United States (Assari, 2020b).

I also found evidence of a quadratic relation between years of education and depressive symptoms. However, this pattern was in the opposite direction compared to Black and White samples, which suggests that the association is flatter at lower levels of SES and declines steeper at greater years of education. This finding is in contrast to my overall interpretation because it suggests that more years of education is associated with lower risk for depressive symptoms compared to fewer years of education, as well as years of education somewhere in the middle. Unlike Black or White samples, Latinx individuals can belong to different racial/ethnic subgroups. The racial and ethnic heterogeneity within Latinx samples has important implications for understanding the mechanisms linking SES to development (Cabrera et al., 2019). Future research should examine how these patterns operate among immigrant and Afro-Latinx samples.

Higher occupational status was associated with a decrease in depressive symptoms, suggesting that lower occupational status is a risk factor among Latinx samples. This finding calls attention to understanding the contexts associated with lower occupational status among Latinx individuals such as low pay, long hours, physical demands, and chronic job stress, as well as the contribution of parental education programs (Updegraff et al., 2007).

Of the three components, only income was positively associated with academic achievement among Latinx samples. Youth from higher income households generally had higher GPAs. This finding is consistent with my overall interpretation that higher income is promotive because it affords parents greater financial resources to invest in their

children's education. The lack of association between parental education and academic achievement, compared to the overall model, corroborates evidence from past research. Smaller associations have been found between parental education and GPA for Latinx high school students compared to White students (Assari et al., 2020c). Thus, the salient promotive factors associated with SES appear to be attributed to the resources afforded by income more so than resources provided by formal education, such as parental involvement. Because prior work has suggested that parental educational attainment is also a meaningful predictor of developmental outcomes for Latinx youth (Cabrera et al., 2019), the promotive effect for income rather than parental years of education may be specific to GPA. Also, structural barriers of parent's involvement in their child's education such as language, inconvenient meeting times, safety concerns, problems with transportation, and feeling unwelcome in their children's school, which are likely intensified within low-income contexts, may hinder the promotive role of parental education (Alexander et al., 2017; Turney & Kao, 2009).

***Multiracial Samples***

The relation of SES with depressive symptoms and academic achievement was linear among Multiracial samples. Higher income, years of education, and occupational status were associated with a decrease in depressive symptoms, suggesting that lower SES is a risk factor in this population. These associations support that there are specific stressors within the contexts associated with lower SES that increase the probability of deviating from normative developmental trajectories. The lack of quadratic association among Multiracial samples suggests that there may be protective processes (e.g., Yoo et al., 2016) for depressive symptoms among those in higher income contexts compared to

White, Black, and Latinx samples. Multiracial participants generally report more depressive symptoms compared to White and monoracial racial/ethnic minority participants (Fisher et al., 2014; Shih & Sanchez, 2005). Therefore, it is justifiable to expect to observe a similar elevated risk among Multiracial samples in higher income contexts. Nonetheless, it is also worth exploring if experiences of multiracial discrimination moderate the association between higher SES and depressive symptoms in this population. Discrimination based on having more than one racial backgrounds has been found to correlate with depressive symptoms (Jackson et al., 2012; Yoo et al., 2016).

There were also associations between each individual component of SES and academic achievement in Multiracial samples, suggesting that higher SES is a promotive factor. Higher income, years of education, and occupational status were positively associated with academic achievement. Youth from higher income households or with parents who had more years of education or higher status occupations generally had higher GPAs. Consistent with my overall interpretation, higher income and more years of education affords parents greater financial and human capital to create contexts that promote normative developmental trajectories. While the association between occupational status and academic achievement is congruent with the overall model, this association was only present among Multiracial samples when estimated separately by race/ethnicity. Parental occupational status contributes to academic achievement over and above household income and parental education among Multiracial students. Perhaps occupational status affords parents social capital, which spills over into parent-child interactions that promote achievement.

### *Native American Samples*

The relation of SES with depressive symptoms was linear among Native American samples. Higher income and occupational status were associated with a decrease in depressive symptoms, suggesting that lower SES is a risk factor in this population. This finding is consistent with my overall interpretation of the risk factors associated with lower income contexts. This pattern is concerning given that Native American households experience poverty (low-income) at a rate almost double that of the general population and are more likely to experience unemployment and work low-wage jobs (Castor et al., 2006; Sarche & Spicer, 2008). Adults working jobs rated as lower status are more likely to experience significant economic-related life events like unemployment and income loss, which can induce stress and increase risk for depressive symptoms. Unlike income and occupational status, fewer years of education was not associated with a higher risk for depressive symptoms beyond the risk factors associated with lower income contexts and aspects of jobs. Interventions and programs aimed at reducing SES disparities may prove more useful by supplementing income and increasing workforce opportunities for stable careers with better pay and working conditions.

The absence of an association between any of the components of SES and academic achievement suggests that SES is less of a promotive factor and more of a risk factor for Native American samples. Neither income, years of education, or occupational status was predictive of academic achievement over and above prior achievement. The lack of association between income and academic achievement suggests that the resource investment perspective does not sufficiently generalize to Native American samples. Interpretations of the null findings for years of education and occupational status should

consider the lower number of correlations included in this study: 13 correlations for years of education and 15 correlations for occupational status. The null associations may also indicate that other promotive factors may be more culturally salient in trajectories of academic achievement among Native American youth. For instance, Native American youth who reported higher levels of spirituality, participated in traditional practices, and attended the Native American Church also reported earning higher grades on average compared to Native American youth who reported lower levels of spirituality, participation, and attendance (Kulis & Tsethlikai, 2016). Future work should consider examining the link between components of SES, depressive symptoms, and achievement among Native American samples from multiple geographic locations such as those living on reservations compared to those living in urban contexts. Research along these lines will help identifying the promotive and risk factors associated with various levels of SES that are contextually salient.

***White Samples***

The relation between SES and depressive symptoms was more often quadratic among White samples, suggesting that lower and higher SES is associated with elevated risk. The quadratic association with depressive symptoms was more consistent across income and years of education for White samples compared to other racial/ethnic samples. These associations suggest that there is a slight increase in depressive symptoms towards higher levels of income and years of education. The data was expected given that most evidence on the developmental consequences of higher SES has been informed by participants from high achieving schools that are predominantly composed of White students (e.g., Luthar, Suh, et al., 2020; Luthar & Latendresse, 2005b). Therefore, the

data support my overall interpretation that there are specific stressors within the contexts associated with lower and higher SES that increase the probability of deviating from normative developmental trajectories. In contrast, higher occupational status was associated with a decrease in depressive symptoms, suggesting that lower occupational status is a risk factor in this population. Therefore, the risk associated with higher SES among White samples is mostly attributed to factors related to the contexts and resources associated with higher income and years of education, rather than occupational status.

The linear associations between SES and academic achievement suggests that SES can also be a promotive factor for White samples. Higher income and more years of education was positively associated with academic achievement. Youth from higher income households and with parents that had more years of education generally had higher GPAs. Consistent with my overall interpretation, higher income and more years of education affords parents greater financial and human capital to create contexts that can be promotive of normative developmental trajectories. However, the presence of a quadratic association between income and academic achievement suggests that there is a slight decline in GPA towards higher levels of income. Notably, this pattern of relation was only present among Whites samples. This result parallels findings from a prior study, which found similar variables (i.e., low academic motivation, frequent delinquency) that increased vulnerability for academic failure among high school students from lower and higher SES backgrounds (Luthar & Ansary, 2005). They also reported that substance use was predictive of lower grades, but only among students from a high-income suburban school.

The big-fish-little-pond effect can help further understanding of the quadratic association between income and academic achievement. The big-fish-little-pond effect, driven by social comparisons, suggests that attending a high achieving school can hinder one's academic self-concept, which is adversely associated with academic performance (Marsh et al., 2008, 2018). Social comparisons, a common proximal process among youth from higher income backgrounds (Luthar, Kumar, et al., 2020), may lead youth to question their academic ability relative to their peers and impact their motivation. Therefore, it is sensible to associate higher SES with risk or vulnerability (National Academies of Sciences, Engineering, and Medicine, 2019b) because it can lead to both depressive symptoms and lower academic achievement over time. Overall, the better is somewhere in the middle model of SES has more support for White samples compared to the other racial/ethnic samples included in this study.

### *The Marginalization-Related Diminished Returns Hypothesis*

Taken together, the observed differences in the magnitude, and sometimes direction, between racial/ethnic samples also contribute to the body of research on the marginalization-related diminished returns of SES. Research on the marginalization-related diminished returns hypothesis suggests that White Americans benefit more from increases in SES compared to racial/ethnic minority Americans, as often supported by associations with SES of weaker magnitude for racial/ethnic minority samples (Assari, 2017b, 2018a). I found partial support for this hypothesis in the current study; there were fewer promotive effects for increases in SES for Asian American, Black, Latinx, and Native American samples compared to White and Multiracial samples. However, the

differences in associations were largely dependent on the interplay between each component of SES and race/ethnicity.

Research on the marginalization-related diminished returns hypothesis has frequently reported smaller associations for Black, compared to White, samples (e.g., Assari, 2018b; Assari et al., 2020b). In this study the relations for income and years of education with depressive symptoms were similar between Black and White samples whereas there was no evidence of an association with occupational status among Black samples. There was less evidence to support diminished returns for Latinx samples with regards to depressive symptoms. The most noticeable diminished returns related to depressive symptoms was with years of education, particularly for Asian American and Native American samples. Overall, the data suggest that the marginalization-related diminished returns hypothesis is not generalizable across components of SES, outcomes, and racial/ethnic samples. Future research on this hypothesis should consider unpacking why some components show different patterns of associations with particular outcomes for specific racial/ethnic populations, including variation within racial/ethnic subgroups.

**Measurement Implications**

The results of the current study contribute to understanding measurement-related variance. Specifically, the data showed that the bivariate associations between individual components of SES and depressive symptoms varied in their magnitude based on the instrument of depressive symptoms, even after adjusting for the influence of the year of data collection and range restriction. There was also evidence that the year of data collection and a restriction of range impacted the bivariate association with depressive symptoms beyond the variability attributed to the measure of depressive symptoms. I

reduced the variability attributed to the measures of depressive symptoms by focusing on a single measure, the CESD. Nonetheless, the differences in the bivariate correlations have potential implications for how measures are used in practice as discussed below. The variability attributed to year of data collection and range restricted was not examined in the path models, thus, it is worth considering their impact on the overall findings.

There were consistent differences in the magnitude of associations between measures of depressive symptoms. The bivariate associations between the individual components of SES and depressive symptoms were consistently smaller for the BPI and MHI5, compared to the CESD. The association between years of education and depressive symptoms was also smaller for the K6 compared to the CESD whereas the association between income and depressive symptoms was larger for the SF36 compared to the CESD. One explanation for these differences is the type of items included in each measure and how those items are worded. Past research has shown that depressive symptom measures have little overlap in the content of their items and symptom domains (Fried, 2017; Santor et al., 2006). The CESD was reported to have the lowest overlap and more distinctly worded items, thus, the authors suggested that results of the CESD are less likely to generalize to other measures (Fried, 2017). Although Fried and colleagues (2017) did not include any of the other measures in this study, the current findings also suggest that the associations with CESD may not generalize to other measures.

A potential implication regarding the type of items included in each measure is the possibility that particular symptoms may be more salient across varying levels of SES and populations. For instance, the CESD asks about levels of happiness, sadness, and depressed mood using separate items whereas the BPI asks about unhappiness, sadness,

and depressed mood with one item and the MHI5 asks about being downhearted and blue, instead of depressed mood, and happiness in separate items. Additionally, the CESD has items regarding sleep and appetite changes whereas the BPI and MHI5 has items related to feeling anxious or nervous. Associations with the BPI, in particular, may also be smaller because it was designed as a parent-report measure. There are often discrepancies between parent-reported depressive symptoms and the child's own report of depressive symptoms especially when the parent reporter is also experiencing symptoms of depression (De Los Reyes & Kazdin, 2005). Future work unpacking the link between SES and depressive symptoms can examine if different symptoms, or network of symptoms (Fried et al., 2016), are prevalent within each level of SES and population. In effect, clinicians can choose the right set of symptoms to assess among individuals struggling with feelings of depression. This is especially important given the increased prevalence of depression during the COVID-19 pandemic in 2020 (Twenge & Joiner, 2020).

The magnitude of associations also varied by the year in which studies collected data. The correlation between income and depressive symptoms was smaller for studies that collected data more recently whereas the correlations for income and occupational prestige with academic achievement were larger for studies that collected data more recently. The smaller association in more recent years between income and depressive symptoms may be attributed to the increase in depressive symptoms for higher income households (Twenge et al., 2019). Therefore, the association between income and depressive symptoms is more likely nonlinear in recent years, which would reduce the magnitude of their linear correlation (Goodwin & Leech, 2006).

The larger correlation between income and academic achievement in recent years is consistent with prior work (Reardon, 2011). The stronger association coincides with increases in parental investment on enrichment resources (e.g., books, activities, instruments) and childcare, particularly for parents with higher incomes due to their increase in income relative to others (Kornrich, 2016). This discrepancy in parental investment may be further exacerbated when inequality is more noticeable (i.e., high income-inequality), thus, making achievement more contextually salient to parents (Schneider et al., 2018). Finally, the larger magnitude in more recent years for the association between occupational prestige and academic achievement is less clear. This is not necessarily attributed to the financial returns associated with more prestigious jobs as the correlation between occupational status, which is based on the amount of education and income earned, and academic achievement was invariant across years of data collection. Future work can investigate the promotive factors that have changed across time and have made prestigious occupations more impactful on children's academic success.

The range of income and years of education also had an influence on associations with depressive symptoms. Specifically, I found larger correlations for studies that did not included income values greater than $120,000, but smaller correlations for studies that did not include values for years of education greater than 16 years. The larger correlation between income and depressive symptoms for studies that had evidence of a range restriction is understandable because studies with incomes greater than $120,000 are likely to show nonlinear patterns with depressive symptoms based on the findings of the current study, thus, reducing the size of the linear correlation (Goodwin & Leech,

2006). In a sort of paradoxical interpretation, the smaller correlation between years of education and depressive symptoms for studies that did not distinguish between years of education higher than 16 years is also understandable because this truncated range can reduce variability and, in turn, the magnitude of the correlation (Goodwin & Leech, 2006). Only 2% of the correlations included in the analyses had a restricted range for years of education. Therefore, effect of a restricted range less likely impacted the current findings. The take home message here is that researchers should consider the extent to which the variability across participants in a specific component of SES, particularly income and years of education, has any impact on the results and ensuing conclusions. For meta-analyses, this could be a potential quality check or risk of bias item.

**Limitations for Future Research Directions**

There were several limitations in the current study that future research can address. First, I examined associations with objective indicators of SES. Subjective SES may also play a role in human development, particularly for mental health outcomes such as depressive symptoms. Because development is a dynamic process, the meaning attributed to one's SES can influence its impact (Rutter & Sroufe, 2000). Supporting evidence has shown that an individual's perception of their status may be just as impactful on their mental health as objective indicators (McLaughlin et al., 2012; Quon & McGrath, 2014; Tan et al., 2020; Zell et al., 2018). Additionally, a prior study found a larger association between racial discrimination and clinical levels of depression for Black adolescents who rated their family's income as more than enough (Assari et al., 2018). However, none of this work has examined quadratic associations between subjective SES and depressive symptoms or academic achievement. Future research

along these lines can further advance understanding of the differences between developmental periods and racial/ethnic samples.

Second, the generalizability of the current findings may be constrained to GPA compared to others measures of academic achievement. GPA is strongly correlated with achievement tests and both are predictive of success in college (Robbins et al., 2004; Sackett et al., 2009). Their association with socioeconomic status, on the other hand, varies (Harwell et al., 2017; Robbins et al., 2004; Sackett et al., 2009). In effect, the path estimates in the current study may also differ if standardized achievement test (e.g., ACT, SAT) are used as a measure of academic achievement instead of GPA. One conceptual difference between the two measures is that GPA is not standardized like achievement tests. GPA is partly influenced by grading policies of the instructor, as well as difficulty of the course. This level of difficulty (e.g., honor's course, advanced placement) was not considered in the current study. Nonetheless, advancing understanding on both measures is important to understanding the promotive factors associated with different levels of SES. For instance, course-taking strategies such as studying, taking notes, or time management are related more to GPA than achievement tests (see Robbins et al., 2004). Therefore, the contexts and resources associated with higher levels of SES may be promotive of particular course-taking strategies.

Third, I used pan-ethnic groupings to examine moderation by race/ethnicity. Broad racial/ethnic groupings (e.g., Latinx, Asian American) do not sufficiently represent the social, cultural, and historical heterogeneity that exists within each pan-ethnic population (DiPietro & Bursik, 2012; Umaña-Taylor & Fine, 2001). Past research has reported substantial differences in particular outcomes, such as depressive symptoms,

within pan-ethnic populations (Cabrera et al., 2019; Camacho et al., 2015; Causadias et al., 2018a). Given the observed variation in path estimates between the pan-ethnic populations in the current study, there will likely be differences within these samples as well. Future research aimed at identifying the pattern of associations within these specific sub-populations will help zero in on the promotive and risk factors that are more contextually salient.

Fourth, I examined individual level SES. Bioecological systems theory and developmental psychopathology emphasize the importance of understanding how multiple levels of organization (levels of analysis) contribute to normative developmental trajectories and deviations from these trajectories (U. Bronfenbrenner & Morris, 2006; Cicchetti & Toth, 2009). For instance, the SES conditions of the neighborhood (i.e., area level SES) is associated with critical developmental outcomes (Leventhal, 2018). Prior evidence also supports that income at the school and neighborhood level are more strongly related to depressive symptoms compared to family income (Coley, Sims, et al., 2018; Lund & Dearing, 2012). Additionally, a past experiment found that when families moved from a high poverty to a low poverty neighborhood, their children under the age of 13 years had better college attendance and greater income earnings in adulthood (Chetty et al., 2016). Because I theorized that SES is linked to human development through the contexts and resources associated with different levels of SES, it will be important to examine if the relations with income, years of education, and occupational status/prestige meaningfully contribute to depressive symptoms and academic achievement beyond, or in interaction with, neighborhood and school level indicators.

Fifth, I did not systematically evaluate the potential for risk of bias within each IPD dataset (L. A. Stewart et al., 2015). There are some aspects of the current study that inform the level of bias. I managed the potential risk of bias in estimating the meta-analytic path parameters by focusing on a single measure of depressive symptoms, thus, reducing the variability between parameters. Also, although a restricted range within each dataset can bias potentially bias the correlations included, there were few correlations that were informed by measures of income (22%) and years of education (2%) with a restricted ranged. However, there may be some bias within datasets for correlations that were informed by nonnormal distributions because the presence of nonnormality can inflate the estimated correlation (Bishara & Hittner, 2015). Risk of bias attributed to sampling (Ahmed et al., 2012) was also reduced in the current study because I only included nationally representative datasets from ICPSR that applied random sampling methods. On the other hand, there may be some risk of bias related to the selection of IPD, particularly for the academic achievement findings. The datasets included in the current study were drawn from a pool of public access datasets on depressive symptoms. Therefore, the current study is not an exhaustive systematic review of the association between SES and academic achievement.

Finally, future developmental research should move towards understanding the mechanism linking each level of SES depressive symptoms and academic achievement, and consider reevaluating these patterns of association in the context of the COVID-19 pandemic. Indeed, the mechanisms associated with different levels of SES are likely component specific both for depressive symptoms (Korous et al., 2018) and academic achievement (Korous et al., 2021). These mechanisms may also vary between

developmental period and racial/ethnic samples (Bradley & Corwyn, 2005). Meta-analytic methods that include mediation can help researchers leverage existing datasets to examine the connections between several variables, which may not be available in a single dataset, that elucidate the pathways from SES to development. Furthermore, given that the COVID-19 pandemic has disproportionately impacted individuals from lower SES backgrounds (Los Angeles County Department of Public Health, Chief Science Office, 2020; Rollston & Galea, 2020), the magnitude of these associations could be different for data collected in 2020 and later. Towards this effort, future investigations can use discontinuity designs.

**Conclusion**

The current dissertation in one of the most comprehensive studies on the pattern of associations between individual components of SES (i.e., income, years of education, occupational status and prestige), depressive symptoms, and academic achievement. The data provide compelling evidence to support an elevated risk for depressive symptoms among individuals from lower *and* higher levels of SES backgrounds, a quadratic effect that was larger for income and more consistent across White samples. Importantly, this pattern of relation (referred to as the better is somewhere in the middle model of SES) indicates that there are risk factors at both ends of the SES extremes, which may be similar across, or specific to, the contexts associated with SES. These findings shift the focus from a deficit perspective of children and families from lower SES backgrounds to understanding the risk and promotive factors across different levels of SES. Directing attention to the promotive factors associated with levels of SES somewhere in the middle

is also likely to advance understanding of why these factors are important for maintaining normative trajectories.

Practitioners, educational institutions, and policy makers can implement this evidence. For practitioners, the data suggest that family background information, such as SES, can be useful for identifying individuals who might be struggling with or at risk for depressive symptoms, but specific attention needs to be placed on the risk factors that are contributing to their experiences; these risk factors are present at both ends of the SES continuum. Additionally, the CESD was shown to pick up on this pattern and, therefore, could be used as an initial assessment of risk along with measures of adverse childhood experiences. For educational institutions, such as high schools and universities, the data speak to the importance of shifting the goals of education. Clearly, students from lower SES backgrounds struggle to achieve under the current norms of individual achievement, which have downstream consequences for students from higher SES backgrounds as well. Finding a balance between class performance and social relationships is a crucial course of action. For policy makers, the data emphasize the significance of income in the United States because it consistently served as a risk for depressive symptoms and an advantage for academic achievement. This robust evidence supports supplemental income and cash transfer programs, as well as wealth redistribution efforts.

To wrap it up, although prominent theorists in social class analysis have used different approaches to understand how society is stratified by economic indicators, they have an overlapping underlying message: stratification strongly impacts an individual's well-being. What they did not necessarily anticipate is the cost of this stratification for *all people*. Given the growing and persistent economic inequality in the United States, it is

critical that developmental scholars and alike continue to follow the path of discovery of the role SES plays in human development. In the years ahead, maybe all children will have an equal opportunity to live happy and healthy lives.

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# APPENDIX A

## TABLES AND FIGURES

**Table 1**

*Summary Characteristics of Each ICPSR Dataset (59) Identified for Inclusion*

| ICPSR Dataset Name | # DS | *N* | $M_{Inc}$ (range) | $M_{Edu}$ (range) | $M_{Status}$ (range) | $M_{Prestige}$ (range) | DS Meas. | AA Meas. | % Dev. P. | % Sex | % Race/Ethnicity |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aging, Status, and Sense of Control (ASOC), 1995, 1998, 2001 [United States] | 3 | 4,858 | 23.53 (0-1,000) | 12.64 (0-18) | 42.34 (1-100) | 39.75 (17-86) | CESD | -- | YA: 5; A: 58; OA: 38 | F: 58; M: 42 | W: 89; L: 4; B: 6; A: 1; N: 1 |
| Americans' Changing Lives: Waves I, II, III, IV, and V, 1986, 1989, 1994, 2002, and 2011 | 5 | 11,729 | 38.43 (0-1,000) | 13.05 (0-20) | 50.79 (1-100) | 42.69 (17-86) | CESD | -- | YA: 1; A: 60; OA: 39 | F: 63; M: 37 | W: 63; L: 4; B: 28; A: 1; N: 1; M: 3 |
| Collaborative Psychiatric Epidemiology Surveys (CPES), 2001-2003 [United States] | 1 | 5,587 | 53.15 (0-333) | 14.47 (7-20) | 58.73 (1-100) | 47.09 (17-86) | CESD | -- | YA: 16; A: 72; OA: 12 | F: 63; M: 37 | W: 11; L: 3; B: 86 |
| Early Childhood Longitudinal Study [United States]: Kindergarten Class of 1998-1999, Kindergarten-Eighth Grade Full Sample | 3 | 32,639 | 56.88 (0-470) | 13.41 (5-20) | 53.21 (1-100) | 44.43 (17-86) | CESD | -- | YA: 4; A: 95; OA: <1 | F: 93; M: 7 | W: 67; L: 14; B: 11; A: 6; N: 2; M: <1 |
| General Social Survey, 1972-2016 [Cumulative File] | 1 | 925 | 29.95 (0-244) | 13.54 (3-20) | 56.75 (3-100) | 46.66 (17-86) | CESD | -- | YA: 8; A: 72; OA: 21 | F: 55; M: 45 | W: 63; L: 13; B: 15; A: 2; M: 6 |
| Health and Retirement Study (HRS) | 15 | 271,359 | 42.36 (-9-974) | 12.94 (0-20) | 50.06 (1-100) | 42.73 (17-86) | CESD | -- | YA: 49; A: 51 | F: 57; M: 43 | W: 71; L: 10; B: 17; M: 1 |

| ICPSR Dataset Name | # DS | *N* | $M_{Inc}$ (range) | $M_{Edu}$ (range) | $M_{Status}$ (range) | $M_{Prestige}$ (range) | DS Meas. | AA Meas. | % Dev. P. | % Sex | % Race/Ethnicity |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Midlife in the United States (MIDUS 2), 2004-2006 | 1 | 3,903 | 33.90 (0-271) | 10.95 (2-16) | 25.38 (1-98) | 32.26 (17-74) | K6 | -- | A: 73; OA: 27 | F: 55; M: 45 | W: 90; L: 3; B: 3; A: <1; N: 1; M: 4 |
| Midlife in the United States (MIDUS 3), 2013-2014 | 1 | 2,689 | 60.35 (-10-338) | 13.46 (8-18) | -- | -- | K6 | -- | A: 54; OA: 46 | F: 55; M: 45 | W: 90; L: 3; B: 3; N: <1; M: 3 |
| Midlife in the United States (MIDUS Refresher), 2011-2014 | 1 | 2,430 | 48.23 (0-999) | 13.07 (8-17) | -- | -- | K6 | -- | A: 75; OA: 25 | F: 53; M: 47 | W: 84; L: 4; B: 5; A: 1; N: 1; M: 4 |
| National Comorbidity Survey: Reinterview (NCS-2), 2001-2002 | 1 | 4,939 | 38.32 (-5-201) | 13.21 (8-18) | -- | -- | -- | -- | YA: 1; A: 99; OA: 1 | F: 53; M: 47 | W: 78; L: 8; B: 10; A: 1; N: 1; M: 2 |
| National Health and Nutrition Examination Survey (NHANES), 2005-2006 | 1 | 4,619 | 47.57 (18-101) | 13.97 (11-18) | 51.84 (5-98) | 42.96 (17-74) | PHQ9 | -- | YA: 21; A: 57; OA: 21 | F: 51; M: 49 | W: 50; L: 25; B: 25 |
| National Health and Nutrition Examination Survey (NHANES), 2007-2008 | 1 | 5,191 | 72.48 (0-329) | 13.82 (2-20) | 51.25 (1-100) | 43.56 (17-86) | PHQ9 | -- | YA: 13; A: 63; OA: 25 | F: 50; M: 50 | W: 49; L: 30; B: 21 |
| National Health Interview Survey, 1997 | 1 | 37,093 | 41.78 (1-75) | 13.09 (5-16) | -- | -- | K6 | -- | YA: 14; A: 68; OA: 19 | F: 57; M: 43 | W: 67; L: 16; B: 14; A: 3; N: <1; M: <1 |

| ICPSR Dataset Name | # DS | *N* | $M_{Inc}$ (range) | $M_{Edu}$ (range) | $M_{Status}$ (range) | $M_{Prestige}$ (range) | DS Meas. | AA Meas. | % Dev. P. | % Sex | % Race/Ethnicity |
|---|---|---|---|---|---|---|---|---|---|---|---|
| National Health Interview Survey, 1998 | 1 | 32,794 | 38.29 (3-75) | 12.70 (0-22) | -- | -- | K6 | -- | YA: 13; A: 68; OA: 19 | F: 56; M: 44 | W: 68; L: 16; B: 13; A: 3; N: 1; M: <1 |
| National Health Interview Survey, 1999 | 1 | 31,304 | 37.87 (3-75) | 12.70 (0-22) | -- | -- | K6 | -- | YA: 14; A: 68; OA: 19 | F: 57; M: 43 | W: 67; L: 16; B: 13; A: 2; N: 1; M: 1 |
| National Health Interview Survey, 2000 | 1 | 32,906 | 57.65 (0-91) | 13.16 (6-16) | -- | -- | K6 | -- | YA: 14; A: 68; OA: 18 | F: 56; M: 44 | W: 66; L: 17; B: 14; A: 3; N: 1; M: 1 |
| National Health Interview Survey, 2001 | 1 | 33,760 | 41.30 (3-101) | 12.50 (8-16) | -- | -- | K6 | -- | YA: 14; A: 68; OA: 17 | F: 56; M: 44 | W: 66; L: 17; B: 13; A: 3; N: 1; M: 1 |
| National Health Interview Survey, 2002 | 1 | 31,568 | 49.61 (1-75) | -- | -- | -- | K6 | -- | YA: 15; A: 67; OA: 18 | F: 56; M: 44 | W: 66; L: 17; B: 13; A: 3; N: <1; M: 1 |
| National Health Interview Survey, 2003 | 1 | 30,918 | 39.13 (3-75) | 12.77 (0-22) | -- | -- | K6 | -- | YA: 14; A: 68; OA: 18 | F: 56; M: 44 | W: 67; L: 18; B: 13; A: 2; N: 1; M: <1 |
| National Health Interview Survey, 2007 | 1 | 23,734 | 28.15 (0-3,500) | 11.20 (0-17) | -- | -- | K6 | -- | YA: 15; A: 66; OA: 19 | F: 55; M: 45 | W: 61; L: 19; B: 16; A: 4; N: 1; M: <1 |

| ICPSR Dataset Name | # DS | *N* | $M_{Inc}$ (range) | $M_{Edu}$ (range) | $M_{Status}$ (range) | $M_{Prestige}$ (range) | DS Meas. | AA Meas. | % Dev. P. | % Sex | % Race/Ethnicity |
|---|---|---|---|---|---|---|---|---|---|---|---|
| National Health Interview Survey, 2008 | 1 | 21,613 | 45.48 (1-75) | 13.32 (5-16) | -- | -- | K6 | -- | YA: 14; A: 67; OA: 19 | F: 55; M: 45 | W: 63; L: 17; B: 15; A: 4; N: 1; M: <1 |
| National Health Interview Survey, 2009 | 1 | 27,842 | 49.00 (1-75) | -- | -- | -- | K6 | -- | YA: 14; A: 58; OA: 18 | F: 55; M: 45 | W: 60; L: 19; B: 16; A: 4; N: 1; M: <1 |
| National Health Interview Survey, 2010 | 1 | 27,395 | 47.74 (0-999) | 13.60 (0-17) | -- | -- | K6 | -- | YA: 14; A: 67; OA: 19 | F: 55; M: 45 | W: 59; L: 20; B: 16; A: 4; N: 1; M: <1 |
| National Health Interview Survey, 2011 | 1 | 34,078 | 27.33 (0-974) | 13.10 (8-20) | 45.49 (1-100) | 40.64 (17-86) | K6 | -- | YA: 14; A: 66; OA: 20 | F: 54; M: 46 | W: 51; L: 18; B: 15; A: 4; N: 1; M: <1 |
| National Health Interview Survey, 2012 | 1 | 35,324 | 15.60 (0-900) | 12.19 (0-17) | -- | -- | K6 | -- | YA: 14; A: 66; OA: 20 | F: 55; M: 45 | W: 62; L: 18; B: 15; A: 4; N: 1; M: <1 |
| National Health Interview Survey, 2013 | 1 | 34,574 | 54.83 (13-101) | 11.74 (0-20) | -- | -- | K6 | -- | YA: 14; A: 65; OA: 21 | F: 54; M: 46 | W: 62; L: 18; B: 15; A: 4; N: 1; M: <1 |
| National Household Survey on Drug Abuse, 1985 | 1 | 7,976 | 55.95 (0-1,000) | 12.97 (0-17) | 58.23 (1-100) | 45.50 (17-86) | CESD | -- | AD: 28; YA: 22; A: 43; OA: 7 | F: 56; M: 44 | W: 50; L: 25; B: 24; A: 1; N: <1 |

| ICPSR Dataset Name | # DS | *N* | $M_{Inc}$ (range) | $M_{Edu}$ (range) | $M_{Status}$ (range) | $M_{Prestige}$ (range) | DS Meas. | AA Meas. | % Dev. P. | % Sex | % Race/Ethnicity |
|---|---|---|---|---|---|---|---|---|---|---|---|
| National Household Survey on Drug Abuse, 1993 | 1 | 26,386 | 32.40 (0-190) | 13.40 (8-20) | 44.64 (1-100) | 41.04 (17-86) | CESD | -- | AD: 26; YA: 21; A: 50; OA: 2 | F: 55; M: 45 | W: 47; L: 26; B: 23; A: 3; N: <1 |
| National Household Survey on Drug Abuse, 1994 | 1 | 4,331 | 52.54 (5-200) | 12.56 (1-20) | -- | -- | CESD | -- | AD: 26; YA: 21; A: 51; OA: 2 | F: 55; M: 45 | W: 49; L: 26; B: 23; A: 2; N: <1 |
| National Longitudinal Study of Adolescent to Adult Health (Add Health), 1994-2008 [Public Use] | 4 | 18,188 | 54.30 (0-391) | 13.76 (1-20) | 50.18 (1-100) | 43.97 (17-86) | CESD | Grades | AD: 35; YA: 43; A: 22 | F: 53; M: 47 | W: 62; L: 11; B: 13; N: 1; M: 4 |
| National Longitudinal Survey of Youth (NLSY): Child Supplement | 34 | 143,941 | 43.21 (0-6,530) | 13.05 (0-25) | 54.21 (1-100) | 44.92 (17-94) | BPI, CESD, MHI5 | GPA, Grades, Both | C: 13; AD: 14; YA: 31; A: 42 | F: 50; M: 50 | W: 41; L: 21; B: 29; A: 1; N: 1; M: 7 |
| National Social Life, Health and Aging Project (NSHAP): Wave 3 | 1 | 4,199 | 15.00 (0-749) | 12.30 (0-17) | -- | -- | CESD | -- | A: 41; OA: 59 | F: 54; M: 46 | W: 71; L: 12; B: 17 |
| National Social Life, Health, and Aging Project (NSHAP): Wave 1, [United States], July 2005-March 2006 | 1 | 2,913 | 46.95 (-1-1,309) | 12.16 (0-17) | -- | -- | CESD | -- | A: 34; OA: 66 | F: 52; M: 48 | W: 72; L: 11; B: 17 |

| ICPSR Dataset Name | # DS | *N* | $M_{Inc}$ (range) | $M_{Edu}$ (range) | $M_{Status}$ (range) | $M_{Prestige}$ (range) | DS Meas. | AA Meas. | % Dev. P. | % Sex | % Race/Ethnicity |
|---|---|---|---|---|---|---|---|---|---|---|---|
| National Social Life, Health, and Aging Project (NSHAP): Wave 2 and Partner Data Collection, [United States], 2010-2011 | 1 | 3,107 | 87.40 (0-455) | 13.99 (2-20) | 55.23 (1-100) | 46.91 (17-86) | CESD | -- | A: 13; OA: 87 | F: 53; M: 47 | W: 74; L: 11; B: 15 |
| National Survey of America's Families (NSAF), 1997 | 2 | 45,423 | 21.35 (0-1,282) | 12.99 (0-18) | 41.11 (1-100) | 38.68 (17-86) | SF36 | -- | AD: <1; YA: 15; A: 84; OA: <1 | F: 70; M: 30 | W: 75; L: 12; B: 13 |
| National Survey of America's Families (NSAF), 1999 | 2 | 43,826 | 37.08 (0-2,750) | 12.73 (0-20) | 45.57 (1-100) | 41.12 (17-86) | SF36 | -- | AD: <1; YA: 15; A: 84; OA: <1 | F: 70; M: 30 | W: 76; L: 11; B: 13 |
| National Survey of America's Families (NSAF), 2002 | 2 | 41,330 | 54.11 (1-4,000) | 13.08 (0-17) | 56.65 (1-100) | 46.10 (17-86) | SF36 | -- | AD: <1; YA: 16; A: 84; OA: <1 | F: 72; M: 28 | W: 74; L: 14; B: 12 |
| National Survey of Families and Households, Wave 1: 1987-1988, [United States] | 1 | 12,722 | 45.98 (18-101) | 13.6 (8-18) | 52.12 (5-98) | 43.10 (17-74) | CESD | -- | YA: 15; A: 69; OA: 15 | F: 60; M: 40 | W: 73; L: 8; B: 18; A: 1; N: <1 |
| National Survey of Families and Households, Wave 2: 1992-1994, [United States] | 2 | 15,129 | 43.79 (3-101) | 13.35 (0-22) | 52.46 (5-98) | 43.32 (17-74) | CESD | -- | YA: 2; A: 82; OA: 16 | F: 57; M: 43 | W: 78; L: 6; B: 15; A: 1; N: <1 |

| ICPSR Dataset Name | # DS | *N* | $M_{Inc}$ (range) | $M_{Edu}$ (range) | $M_{Status}$ (range) | $M_{Prestige}$ (range) | DS Meas. | AA Meas. | % Dev. P. | % Sex | % Race/Ethnicity |
|---|---|---|---|---|---|---|---|---|---|---|---|
| National Survey of Families and Households, Wave 3: 2001-2003, [United States] | 2 | 6,734 | 34.13 (-10-1,000) | 13.26 (0-20) | 61.91 (1-100) | 47.20 (17-86) | CESD | -- | A: 72; OA: 28 | F: 61; M: 39 | W: 83; L: 4; B: 13; A: <1; N: <1 |
| National Survey of Functional Health Status, 1990 | 1 | 2,342 | 47.79 (0-268) | 12.13 (2-18) | 29.79 (1-100) | 34.21 (17-86) | SF36 | -- | YA: 8; A: 63; OA: 28 | F: 57; M: 43 | W: 87; L: 3; B: 9; A: 1 |
| National Survey on Drug Use and Health, 2002 | 2 | 51,587 | 45.92 (0-800) | 13.39 (0-20) | 56.50 (1-100) | 47.07 (17-86) | K6 | Grades | AD: 30; YA: 34; A: 32; OA: 4 | F: 53; M: 47 | W: 70; L: 12; B: 12; A: 3; N: 1; M: 2 |
| National Survey on Drug Use and Health, 2004 | 2 | 53,030 | 63.19 (0-596) | 14.11 (6-20) | 59.25 (1-100) | 48.30 (17-86) | K6 | Grades | AD: 30; YA: 35; A: 32; OA: 4 | F: 53; M: 47 | W: 66; L: 14; B: 12; A: 4; N: 1; M: 2 |
| National Survey on Drug Use and Health, 2005 | 2 | 53,487 | 45.22 (1-75) | 12.92 (5-16) | -- | -- | K6 | Grades | AD: 31; YA: 34; A: 31; OA: 4 | F: 54; M: 46 | W: 65; L: 15; B: 12; A: 4; N: 1; M: 2 |
| National Survey on Drug Use and Health, 2006 | 2 | 52,879 | 64.01 (0-300) | 13.67 (0-22) | 64.68 (1-100) | 50.91 (17-86) | K6 | Grades | AD: 31; YA: 34; A: 32; OA: 4 | F: 53; M: 47 | W: 66; L: 15; B: 12; A: 4; N: 1; M: 2 |

| ICPSR Dataset Name | # DS | *N* | $M_{Inc}$ (range) | $M_{Edu}$ (range) | $M_{Status}$ (range) | $M_{Prestige}$ (range) | DS Meas. | AA Meas. | % Dev. P. | % Sex | % Race/Ethnicity |
|---|---|---|---|---|---|---|---|---|---|---|---|
| National Survey on Drug Use and Health, 2007 | 2 | 53,240 | 49.66 (1-75) | -- | -- | -- | K6 | Grades | AD: 30; YA: 34; A: 32; OA: 4 | F: 53; M: 47 | W: 66; L: 15; B: 12; A: 4; N: 1; M: 3 |
| National Survey on Drug Use and Health, 2008 | 2 | 53,081 | 57.73 (0-408) | 12.30 (0-20) | 53.58 (1-100) | 45.76 (17-86) | K6 | Grades | AD: 30; YA: 35; A: 31; OA: 4 | F: 53; M: 47 | W: 63; L: 16; B: 13; A: 4; N: 2; M: 3 |
| National Survey on Drug Use and Health, 2009 | 2 | 53,277 | 65.61 (0-2,800) | 13.62 (0-20) | 54.72 (1-100) | 46.70 (17-86) | K6 | Grades | AD: 29; YA: 35; A: 32; OA: 4 | F: 53; M: 47 | W: 63; L: 16; B: 12; A: 4; N: 1; M: 3 |
| National Survey on Drug Use and Health, 2010 | 2 | 55,310 | 62.35 (-5-300) | 14.06 (4-20) | 64.37 (1-100) | 51.32 (17-86) | K6 | Grades | AD: 30; YA: 34; A: 32; OA: 4 | F: 53; M: 47 | W: 63; L: 16; B: 12; A: 4; N: 2; M: 3 |
| National Survey on Drug Use and Health, 2011 | 2 | 56,326 | 41.23 (0-100) | 13.24 (0-18) | -- | -- | K6 | Grades | AD: 31; YA: 34; A: 31; OA: 4 | F: 52; M: 48 | W: 63; L: 16; B: 13; A: 4; N: 2; M: 3 |
| National Survey on Drug Use and Health, 2012 | 2 | 53,352 | 18.79 (0-3,530) | 12.94 (0-20) | 53.80 (1-100) | 44.03 (17-86) | K6 | Grades | AD: 29; YA: 35; A: 31; OA: 5 | F: 53; M: 47 | W: 62; L: 16; B: 13; A: 5; N: 1; M: 3 |

| ICPSR Dataset Name | # DS | *N* | $M_{Inc}$ (range) | $M_{Edu}$ (range) | $M_{Status}$ (range) | $M_{Prestige}$ (range) | DS Meas. | AA Meas. | % Dev. P. | % Sex | % Race/Ethnicity |
|---|---|---|---|---|---|---|---|---|---|---|---|
| National Survey on Drug Use and Health, 2013 | 2 | 53,018 | 42.20 (1-75) | 12.58 (0-22) | -- | -- | K6 | Grades | AD: 30; YA: 34; A: 32; OA: 4 | F: 54; M: 46 | W: 61; L: 17; B: 13; A: 5; N: 1; M: 3 |
| National Survey on Drug Use and Health, 2014 | 2 | 53,596 | 39.34 (1-75) | 12.86 (0-22) | -- | -- | K6 | Grades | AD: 23; YA: 24; A: 46; OA: 7 | F: 53; M: 47 | W: 62; L: 16; B: 12; A: 5; N: 2; M: 3 |
| New Family Structures Study | 1 | 2,787 | 42.31 (1-75) | 13.01 (5-16) | -- | -- | CESD | -- | YA: 43; A: 57 | F: 68; M: 32 | W: 65; L: 16; B: 15; M: 4 |
| Physical Violence in American Families, 1985 | 1 | 5,163 | 57.79 (0-314) | 13.39 (2-20) | 45.78 (1-100) | 41.47 (17-86) | PERID | -- | YA: 10; A: 81; OA: 9 | F: 60; M: 40 | W: 78; B: 16; A: 2; N: 4 |
| Religion, Aging, and Health Survey, 2001, 2004 [United States] | 2 | 2,428 | 52.99 (0-440) | 13.03 (2-20) | 54.59 (1-100) | 46.41 (17-86) | CESD | -- | OA: 100 | F: 62; M: 38 | W: 50; B: 46; M: 4 |
| Teenage Attitudes and Practices Survey, 1989: [United States] | 1 | 8,479 | 32.08 (1-50) | 13.20 (0-17) | -- | -- | -- | -- | AD: 84; YA: 16 | F: 49; M: 51 | W: 75; L: 10; B: 16 |

| ICPSR Dataset Name | # DS | *N* | $M_{Inc}$ (range) | $M_{Edu}$ (range) | $M_{Status}$ (range) | $M_{Prestige}$ (range) | DS Meas. | AA Meas. | % Dev. P. | % Sex | % Race/Ethnicity |
|---|---|---|---|---|---|---|---|---|---|---|---|
| United States National Health Measurement Study, 2005-2006 | 1 | 3,731 | 25.45 (0-700) | 10.99 (0-17) | -- | -- | SF36 | -- | A: 56; OA: 44 | F: 57; M: 43 | W: 66; L: 3; B: 28; A: 1; N: 1; M: 1 |
| Violence and Threats of Violence Against Women and Men in the United States, 1994-1996 | 1 | 15,488 | 26.13 (3-85) | 11.70 (0-17) | 51.36 (1-100) | 43.81 (17-94) | SF36 | -- | YA: 13; A: 75; OA: 12 | F: 50; M: 50 | W: 79; L: 8; B: 9; A: 2; N: 1; M: 2 |

*Note.* ICPSR = Inter-university Consortium for Political and Social Research; #DS = number of individual participant datasets from each ICPSR dataset; *N* = sample size; $M_{Inc}$ = mean income; $M_{Edu}$ = mean years of educaiton; $M_{Status}$ = mean occupational status score; $M_{Prestige}$ = mean occupational prestige score; range = range of values across participants within each dataset; DS Meas. = measure of depressive symptoms (BPI = Behavior Problem Index, CESD = Center for Epidemiological Studies-Depression, K6 = K6, MHI5 = Mental Health Inventory 5, PERID = Psychiatric Epidemiological Research Interview Demoralization Scale, SF36 = Short Form 36); AA Meas. = measure of academic achievement; % Dev. P. = percentage of participants in each developmental period (CH = children 5 to 11 years, AD = adolescents 12 to 18 years, YA = young adults 18 to 25 years, A = adults 26 to 64 years, OA = older adults 65+ years); % Sex = percentage of participants that are female (F) or male (M); % Race/Ethnicity = percentage of participants in each racial/ethnic sample (A = Asian American, B = Black, L = Latinx, N = Native American, M = Multiracial, W = White).

**Table 2**

*Number of Extracted Correlation Matrices By Developmental Period, Sex, and Race/Ethnicity*

| Developmental Period | White | | Black | | Hispanic/ Latinx | | Asian American | | Native American | | Multiracial | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | F | M | F | M | F | M | F | M | F | M | F | M |
| Children | 23 | 22 | 23 | 22 | 26 | 26 | 3 | 4 | 13 | 12 | 26 | 28 |
| Adolescents | 56 | 51 | 56 | 54 | 50 | 49 | 20 | 24 | 27 | 27 | 41 | 41 |
| Young Adults | 74 | 89 | 78 | 65 | 71 | 63 | 53 | 33 | 33 | 45 | 41 | 39 |
| Adults | 94 | 91 | 91 | 95 | 92 | 100 | 48 | 46 | 63 | 46 | 58 | 48 |
| Older Adults | 58 | 50 | 55 | 58 | 52 | 39 | 18 | 29 | 28 | 21 | 24 | 26 |

*Note.* F = Female; M = Male.

**Table 3**

*Summary of Extracted Correlations*

| Variables | # of Correlations | Unweighted Mean | *SD* | Min | Max |
|---|---|---|---|---|---|
| Income - Income$^2$ | 2717 | 0.52 | 0.42 | -1.00 | 1.00 |
| Income - Education | 2464 | 0.30 | 0.23 | -0.94 | 1.00 |
| Income - Education$^2$ | 2463 | 0.04 | 0.23 | -0.94 | 1.00 |
| Income - Occupational Status | 1177 | 0.26 | 0.25 | -1.00 | 0.98 |
| Income - Occupational Status$^2$ | 1177 | 0.03 | 0.24 | -0.96 | 0.99 |
| Income - Occupational Prestige | 1177 | 0.23 | 0.26 | -0.99 | 1.00 |
| Income - Occupational Prestige$^2$ | 1177 | 0.06 | 0.25 | -0.99 | 1.00 |
| Income - Depressive Symptoms | 2573 | -0.12 | 0.18 | -0.92 | 0.90 |
| Income - Depressive Symptoms (Prior Wave) | 888 | -0.11 | 0.18 | -0.78 | 0.92 |
| Income - Academic Achievement | 463 | 0.13 | 0.21 | -0.92 | 1.00 |
| Income - Academic Achievement (Prior Wave) | 211 | 0.11 | 0.23 | -0.63 | 0.96 |
| Income$^2$ - Education | 2464 | 0.12 | 0.24 | -1.00 | 1.00 |
| Income$^2$ - Education | 2463 | 0.10 | 0.22 | -1.00 | 1.00 |
| Income$^2$ - Occupational Status | 1177 | 0.11 | 0.24 | -1.00 | 1.00 |
| Income$^2$ - Occupational Status$^2$ | 1177 | 0.07 | 0.25 | -0.95 | 1.00 |
| Income$^2$ - Occupational Prestige | 1177 | 0.10 | 0.25 | -0.98 | 0.99 |
| Income$^2$ - Occupational Prestige$^2$ | 1177 | 0.07 | 0.25 | -0.98 | 1.00 |
| Income$^2$ - Depressive Symptoms | 2573 | -0.02 | 0.17 | -0.97 | 0.96 |
| Income$^2$ - Depressive Symptoms (Prior Wave) | 888 | -0.03 | 0.17 | -0.85 | 0.86 |
| Income$^2$ - Academic Achievement | 463 | 0.06 | 0.21 | -0.95 | 0.99 |
| Income$^2$ - Academic Achievement (Prior Wave) | 211 | 0.02 | 0.24 | -0.94 | 0.89 |
| Education - Education$^2$ | 2485 | -0.05 | 0.41 | -0.95 | 1.00 |
| Education - Occupational Status | 1114 | 0.40 | 0.28 | -1.00 | 1.00 |
| Education - Occupational Status$^2$ | 1114 | 0.11 | 0.31 | -0.98 | 1.00 |

| Variables | # of Correlations | Unweighted Mean | *SD* | Min | Max |
|---|---|---|---|---|---|
| Education - Occupational Prestige | 1114 | 0.40 | 0.29 | -1.00 | 1.00 |
| Education - Occupational Prestige$^2$ | 1114 | 0.17 | 0.30 | -1.00 | 1.00 |
| Education - Depressive Symptoms | 2486 | -0.11 | 0.20 | -0.97 | 0.99 |
| Education - Depressive Symptoms (Prior Wave) | 836 | -0.12 | 0.25 | -0.86 | 0.94 |
| Education - Academic Achievement | 293 | 0.17 | 0.31 | -0.95 | 0.97 |
| Education - Academic Achievement (Prior Wave) | 193 | 0.14 | 0.32 | -0.96 | 1.00 |
| Education$^2$ - Occupational Status | 1113 | 0.14 | 0.29 | -0.95 | 1.00 |
| Education$^2$ - Occupational Status$^2$ | 1113 | 0.16 | 0.29 | -0.89 | 1.00 |
| Education$^2$ - Occupational Prestige | 1113 | 0.14 | 0.31 | -0.97 | 1.00 |
| Education$^2$ - Occupational Prestige$^2$ | 1113 | 0.17 | 0.31 | -1.00 | 1.00 |
| Education$^2$ - Depressive Symptoms | 2485 | 0.00 | 0.19 | -0.97 | 0.99 |
| Education$^2$ - Depressive Symptoms (Prior Wave) | 836 | 0.01 | 0.24 | -0.90 | 0.94 |
| Education$^2$ - Academic Achievement | 293 | 0.00 | 0.30 | -1.00 | 0.81 |
| Education$^2$ - Academic Achievement (Prior Wave) | 193 | 0.03 | 0.29 | -0.99 | 1.00 |
| Occupational Status - Occupational Status$^2$ | 1181 | 0.10 | 0.43 | -1.00 | 1.00 |
| Occupational Status - Occupational Prestige | 1181 | 0.83 | 0.11 | -0.53 | 1.00 |
| Occupational Status - Occupational Prestige$^2$ | 1181 | 0.21 | 0.31 | -1.00 | 1.00 |
| Occupational Status - Depressive Symptoms | 1181 | -0.08 | 0.22 | -1.00 | 0.95 |
| Occupational Status - Depressive Symptoms (Prior Wave) | 631 | -0.08 | 0.24 | -0.98 | 0.94 |
| Occupational Status - Academic Achievement | 279 | 0.12 | 0.26 | -0.96 | 0.92 |
| Occupational Status - Academic Achievement (Prior Wave) | 191 | 0.14 | 0.26 | -0.96 | 1.00 |
| Occupational Status$^2$ - Occupational Prestige | 1181 | 0.13 | 0.37 | -1.00 | 1.00 |

| Variables | # of Correlations | Unweighted Mean | *SD* | Min | Max |
|---|---|---|---|---|---|
| Occupational Status$^2$ - Occupational Prestige$^2$ | 1181 | 0.61 | 0.23 | -0.92 | 1.00 |
| Occupational Status - Depressive Symptoms | 1181 | 0.00 | 0.22 | -0.98 | 0.97 |
| Occupational Status - Depressive Symptoms (Prior Wave) | 631 | 0.00 | 0.23 | -0.98 | 0.99 |
| Occupational Status - Academic Achievement | 279 | 0.02 | 0.26 | -0.97 | 0.91 |
| Occupational Status - Academic Achievement (Prior Wave) | 191 | 0.03 | 0.27 | -0.78 | 0.98 |
| Occupational Prestige - Occupational Prestige$^2$ | 1181 | 0.31 | 0.32 | -1.00 | 1.00 |
| Occupational Prestige - Depressive Symptoms | 1181 | -0.07 | 0.21 | -0.94 | 0.99 |
| Occupational Prestige - Depressive Symptoms (Prior Wave) | 631 | -0.07 | 0.23 | -0.93 | 0.97 |
| Occupational Prestige - Academic Achievement | 279 | 0.11 | 0.28 | -1.00 | 0.96 |
| Occupational Prestige - Academic Achievement (Prior Wave) | 191 | 0.11 | 0.28 | -0.99 | 1.00 |
| Occupational Prestige$^2$ - Depressive Symptoms | 1181 | -0.01 | 0.22 | -0.99 | 0.99 |
| Occupational Prestige$^2$ - Depressive Symptoms (Prior Wave) | 631 | -0.02 | 0.23 | -0.97 | 0.95 |
| Occupational Prestige$^2$ - Academic Achievement | 279 | 0.04 | 0.25 | -0.93 | 0.99 |
| Occupational Prestige$^2$ - Academic Achievement (Prior Wave) | 191 | 0.03 | 0.27 | -0.84 | 0.99 |
| Depressive Symptoms - Depressive Symptoms (Prior Wave) | 890 | 0.47 | 0.19 | -0.36 | 1.00 |
| Depressive Symptoms - Academic Achievement | 319 | -0.11 | 0.23 | -1.00 | 1.00 |
| Depressive Symptoms - Academic Achievement (Prior Wave) | 211 | -0.09 | 0.25 | -0.99 | 0.82 |
| Depressive Symptoms (Prior Wave) - Academic Achievement | 225 | -0.07 | 0.23 | -0.86 | 0.66 |

| Variables | # of Correlations | Unweighted Mean | *SD* | Min | Max |
|---|---|---|---|---|---|
| Depressive Symptoms (Prior Wave) - Academic Achievement (Prior Wave) | 199 | -0.12 | 0.23 | -0.89 | 0.58 |
| Academic Achievement - Academic Achievement (Prior Wave) | 211 | 0.49 | 0.29 | -1.00 | 0.98 |

*Note.* The unweighted mean does not account for sample size or variability. It is for descriptive purposes only. Min = Smallest (most negative) correlation. Max = Largest (most positive)

**Table 4**

*Example of a Square Correlation Matrix Based on Wave 1 (1995) of Add Health for Black, Adolescent Males*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Income | 1.0 | .64 | .44 | .04 | -- | -- | -- | -- | -.15 | -- | .13 | -- |
| 2. Income$^2$ | .64 | 1.0 | .04 | -.01 | -- | -- | -- | -- | .00 | -- | -.02 | -- |
| 3. Education | .44 | .04 | 1.0 | -.05 | -- | -- | -- | -- | -.18 | -- | .18 | -- |
| 4. Education$^2$ | .04 | -.01 | -.05 | 1.0 | -- | -- | -- | -- | .07 | -- | .07 | -- |
| 5. Occ. Status | -- | -- | -- | -- | 1.0 | -- | -- | -- | -- | -- | -- | -- |
| 6. Occ. Status$^2$ | -- | -- | -- | -- | -- | 1.0 | -- | -- | -- | -- | -- | -- |
| 7. Occ. Prestige | -- | -- | -- | -- | -- | -- | 1.0 | -- | -- | -- | -- | -- |
| 8. Occ. Prestige$^2$ | -- | -- | -- | -- | -- | -- | -- | 1.0 | -- | -- | -- | -- |
| 9. Dep. Symptoms | -.15 | .00 | -.18 | .07 | -- | -- | -- | -- | 1.0 | -- | -.24 | -- |
| 10. Dep. Symptoms PW | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.0 | -- | -- |
| 11. Achievement | .13 | -.02 | .18 | .07 | -- | -- | -- | -- | -.24 | -- | 1.0 | -- |
| 12. Achievement PW | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.0 |

*Note.* Add Health = National Longitudinal Study of Adolescent to Adult Health. Double dashes indicate missing data. Occ. = Occupational; Dep. = Depressive; PW = Prior Wave.

**Table 5**

*Number of Extracted Correlations Included in Model 1 and/or Model 2 for Each Cell*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Income | | | | | | | | | | | |
| 2. Income$^2$ | 1,305 | | | | | | | | | | |
| 3. Education | 1,095 | 1,095 | | | | | | | | | |
| 4. Education$^2$ | 1,095 | 1,095 | 1,099 | | | | | | | | |
| 5. Occ. Status | 659 | 659 | 635 | 635 | | | | | | | |
| 6. Occu. Status$^2$ | 659 | 659 | 635 | 635 | 662 | | | | | | |
| 7. Occ. Prestige | 659 | 659 | 635 | 635 | 662 | 662 | | | | | |
| 8. Occ. Prestige$^2$ | 659 | 659 | 635 | 635 | 662 | 662 | 662 | | | | |
| 9. Dep. Symptoms | 1,028 | 1,028 | 966 | 966 | 529 | 529 | 529 | 529 | | | |
| 10 Dep. Symptoms PW | 573 | 573 | 556 | 556 | 319 | 319 | 319 | 319 | 575 | | |
| 11. Achievement | 463 | 463 | 293 | 293 | 279 | 279 | 279 | 279 | 216 | 145 | |
| 12. Achievement PW | 211 | 211 | 193 | 193 | 191 | 191 | 191 | 191 | 138 | 126 | 211 |

*Note.* Occ. = Occupational; Dep. = Depressive; PW = Prior Wave.

**Table 6**

*Model 1 Implied Correlations and* $\hat{\tau}^2$

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| With Occupational Status | | | | | | | |
| 1. Income | | .017 | .014 | .004 | -- | .008 | -- |
| 2. Education | .26 | | .029 | .013 | -- | .062 | -- |
| 3. Occ. Status | .26 | .40 | | .002 | -- | .030 | -- |
| 4. Dep. Symptoms | -.12 | -.13 | -.10 | | .018 | .014 | .021 |
| 5. Dep. Symptoms PW | -- | -- | -- | .46 | | .023 | .020 |
| 6. Achievement | .13 | .17 | .11 | -.14 | -.07 | | .044 |
| 7. Achievement PW | -- | -- | -- | -.07 | -.14 | .50 | |
| With Occupational Prestige | | | | | | | |
| 1. Income | | .017 | .011 | .004 | -- | .008 | -- |
| 2. Education | .26 | | .036 | .013 | -- | .062 | -- |
| 3. Occ. Prestige | .23 | .40 | | .003 | -- | .036 | -- |
| 4. Dep. Symptoms | -.12 | -.13 | -.09 | | .018 | .014 | .020 |
| 5. Dep. Symptoms PW | -- | -- | -- | .46 | | .023 | .019 |
| 6. Achievement | .13 | .17 | .12 | -.14 | -.07 | | .043 |
| 7. Achievement PW | -- | -- | -- | -.07 | -.14 | .50 | |

*Note.* Lower triangle = $\hat{r}$. Upper triangle = $\hat{\tau}^2$. Double dashes indicate that the model parameters were not estimated. Occ. = Occupational; Dep. = Depressive; PW = Prior Wave.

**Table 7**

*Model 1 Parameter Estimates*

| Exogenous Variables | Dep. Symptoms $R^2 = .24^a$ | | | Achievement $R^2 = .29^a$ | | |
|---|---|---|---|---|---|---|
| | *β* | *SE* | *p* | *β* | *SE* | *p* |
| With Occupational Status | | | | | | |
| Income | -.085 | .004 | .000 | .087 | .008 | .000 |
| Education | -.089 | .006 | .000 | .133 | .020 | .000 |
| Occ. Status | -.038 | .006 | .000 | .038 | .017 | .024 |
| Dep. Symptoms PW | .465 | .007 | .000 | -- | -- | -- |
| Achievement PW | -- | -- | -- | .503 | .016 | .000 |
| With Occupational Prestige | | | | | | |
| Income | -.087 | .004 | .000 | .088 | .008 | .000 |
| Education | -.091 | .006 | .000 | .134 | .021 | .000 |
| Occ. Prestige | -.031 | .006 | .000 | .042 | .018 | .018 |
| Dep. Symptoms PW | .465 | .007 | .000 | -- | -- | -- |
| Achievement PW | -- | -- | -- | .504 | .016 | .000 |

*Note.* Double dashes indicate that the model parameters were not estimated. Occ. = Occupational; Dep. = Depressive; PW = Prior Wave. *SE* = Standard Error; *p* = *p-value.* [a] = $R^2$ values are the same between the model with occupational status and the model with occupational prestige.

**Table 8**

*Model 2 Implied Correlations and* $\hat{\tau}^2$

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| With Occupational Status | | | | | | | | | | |
| 1. Income | | .125 | .017 | .008 | .009 | .003 | .004 | -- | .010 | -- |
| 2. Income$^2$ | .60 | | .008 | .005 | .003 | .002 | .001 | -- | .012 | -- |
| 3. Education | .26 | .11 | | .112 | .029 | .029 | .013 | -- | .065 | -- |
| 4. Education$^2$ | .03 | .06 | -.05 | | .022 | .031 | .008 | -- | .060 | -- |
| 5. Occ. Status | .26 | .11 | .40 | .13 | | .102 | .003 | -- | .033 | -- |
| 6. Occ. Status$^2$ | .02 | .05 | .07 | .14 | .06 | | .003 | -- | .034 | -- |
| 7. Dep. Symptoms | -.12 | -.03 | -.13 | .02 | -.09 | .01 | | .018 | .015 | .023 |
| 8. Dep. Symptoms PW | -- | -- | -- | -- | -- | -- | .46 | | .024 | .021 |
| 9. Achievement | .13 | .05 | .17 | -.00 | .12 | .02 | -.13 | -.07 | | .051 |
| 10. Achievement PW | -- | -- | -- | -- | -- | -- | -.07 | -.14 | .50 | |
| With Occupational Prestige | | | | | | | | | | |
| 1. Income | | .125 | .017 | .008 | .006 | .003 | .004 | -- | .010 | -- |
| 2. Income$^2$ | .60 | | .008 | .005 | .002 | .002 | .001 | -- | .012 | -- |
| 3. Education | .26 | .11 | | .112 | .035 | .026 | .013 | -- | .066 | -- |
| 4. Education$^2$ | .03 | .06 | -.05 | | .025 | .032 | .008 | -- | .061 | -- |
| 5. Occ. Prestige | .23 | .09 | .40 | .15 | | .049 | .003 | -- | .040 | -- |
| 6. Occ. Prestige$^2$ | .06 | .06 | .16 | .17 | .29 | | .001 | -- | .034 | -- |
| 7. Dep. Symptoms | -.11 | -.03 | -.13 | .02 | -.08 | -.01 | | .018 | .015 | .023 |
| 8. Dep. Symptoms PW | -- | -- | -- | -- | -- | -- | .46 | | .024 | .021 |
| 9. Achievement | .13 | .05 | .17 | -.00 | .12 | .04 | -.14 | -.07 | | .050 |
| 10. Achievement PW | -- | -- | -- | -- | -- | -- | -.07 | -.14 | .50 | |

*Note.* Lower triangle = $\hat{r}$. Upper triangle = $\hat{\tau}^2$. Double dashes indicate that the model parameters were not estimated. Occ. = Occupational; Dep. = Depressive; PW = Prior Wave.

**Table 9**

*Model 2 Parameter Estimates*

| Exogenous Variables | Dep. Symptoms $R^2 = .24^a$ | | | Achievement $R^2 = .29^a$ | | |
|---|---|---|---|---|---|---|
| | *β* | *SE* | *p* | *β* | *SE* | *p* |
| With Occupational Status | | | | | | |
| Income | -.111 | .006 | .000 | .104 | .012 | .000 |
| Income$^2$ | .047 | .005 | .000 | -.029 | .011 | .010 |
| Education | -.087 | .006 | .000 | .131 | .021 | .000 |
| Education$^2$ | .018 | .005 | .000 | -.005 | .017 | .777 |
| Occ. Status | -.037 | .006 | .000 | .040 | .018 | .025 |
| Occ. Status$^2$ | .015 | .005 | .003 | .007 | .014 | .622 |
| Dep. Symptoms PW | .464 | .007 | .000 | -- | -- | -- |
| Achievement PW | -- | -- | -- | .501 | .017 | .000 |
| With Occupational Prestige | | | | | | |
| Income | -.113 | .006 | .000 | .105 | .012 | .000 |
| Income$^2$ | .047 | .005 | .000 | -.029 | .011 | .010 |
| Education | -.089 | .006 | .000 | .132 | .021 | .000 |
| Education$^2$ | .018 | .005 | .000 | -.003 | .017 | .844 |
| Occ. Prestige | -.035 | .007 | .000 | .045 | .020 | .024 |
| Occ. Prestige$^2$ | .018 | .005 | .000 | -.002 | .015 | .896 |
| Dep. Symptoms PW | .464 | .007 | .000 | -- | -- | -- |
| Achievement PW | -- | -- | -- | .501 | .016 | .000 |

*Note.* Double dashes indicate that the model parameters were not estimated. Occ. = Occupational; Dep. = Depressive; PW = Prior Wave. *SE* = Standard Error; *p* = *p-value*. [a] = $R^2$ values are the same between the model with occupational status and the model with occupational prestige.

**Table 10**

*Moderation of Parameter Estimates by Developmental Period*

| Paths | $\chi^2(18) = 295.62, p < .001$ | | | | |
|---|---|---|---|---|---|
| | $\beta$ | *SE* | $p$ | $\hat{\tau}^2$ | $R^2$ |
| Income → Dep. Symptoms | | | | .003 | .289 |
| Intercept (Adults) | -.161 | .008 | .000 | | |
| Adolescents | .123 | .017 | .000 | | |
| Young Adults | .105 | .014 | .000 | | |
| Older Adults | .083 | .012 | .000 | | |
| Income$^2$ → Dep. Symptoms | | | | .001 | .057 |
| Intercept (Adults) | .078 | .006 | .000 | | |
| Adolescents | -.054 | .014 | .000 | | |
| Young Adults | -.050 | .011 | .000 | | |
| Older Adults | -.061 | .009 | .000 | | |
| Education → Dep. Symptoms | | | | .012 | .068 |
| Intercept (Adults) | -.099 | .009 | .000 | | |
| Adolescents | .072 | .020 | .000 | | |
| Young Adults | .016 | .017 | .359 | | |
| Older Adults | .013 | .016 | .410 | | |
| Education$^2$ → Dep. Symptoms | | | | .007 | .073 |
| Intercept (Adults) | .022 | .006 | .001 | | |
| Adolescents | -.052 | .015 | .000 | | |
| Young Adults | -.027 | .012 | .028 | | |
| Older Adults | .027 | .011 | .012 | | |
| Occ. Status → Dep. Symptoms | | | | .002 | .232 |
| Intercept (Adults) | -.047 | .008 | .000 | | |
| Adolescents | .034 | .020 | .084 | | |
| Young Adults | .033 | .014 | .021 | | |
| Older Adults | -.007 | .018 | .706 | | |
| Occ. Status$^2$ → Dep. Symptoms | | | | .003 | .072 |
| Intercept (Adults) | .026 | .007 | .000 | | |
| Adolescents | -.030 | .017 | .075 | | |
| Young Adults | -.011 | .012 | .358 | | |
| Older Adults | -.041 | .016 | .009 | | |

*Note.* Occ. = Occupational; Dep. = Depressive; *SE* = Standard Error; $p$ = *p-value;* $\hat{\tau}^2$ = residual variability; $R^2$ = explained variability between correlations; $\chi^2$ = chi-square of the omnibus test of moderation. Moderation on paths to achievement were not examined.

**Table 11**

*Moderation of Parameter Estimates by Sex*

| Paths | $\chi^2(12) = 17.00, p = .150$ | | | | |
|---|---|---|---|---|---|
| | $\beta$ | *SE* | $p$ | $\hat{\tau}^2$ | $R^2$ |
| Income → Dep. Symptoms | | | | .004 | .000 |
| Intercept (Females) | -.107 | .008 | .000 | | |
| Males | -.010 | .011 | .340 | | |
| Income$^2$ → Dep. Symptoms | | | | .001 | .000 |
| Intercept (Females) | .042 | .006 | .000 | | |
| Males | .011 | .008 | .165 | | |
| Education → Dep. Symptoms | | | | .013 | .003 |
| Intercept (Females) | -.090 | .009 | .000 | | |
| Males | .005 | .013 | .670 | | |
| Education$^2$ → Dep. Symptoms | | | | .008 | .002 |
| Intercept (Females) | .015 | .006 | .018 | | |
| Males | .008 | .009 | .375 | | |
| Occ. Status → Dep. Symptoms | | | | .003 | .024 |
| Intercept (Females) | -.047 | .008 | .000 | | |
| Males | .021 | .012 | .085 | | |
| Occ Status$^2$ → Dep. Symptoms | | | | .003 | .011 |
| Intercept (Females) | .023 | .007 | .001 | | |
| Males | -.017 | .010 | .092 | | |
| Income → Achievement | | | | .010 | .020 |
| Intercept (Females) | .117 | .017 | .000 | | |
| Males | -.026 | .024 | .296 | | |
| Income$^2$ → Achievement | | | | .012 | .006 |
| Intercept (Females) | -.031 | .016 | .053 | | |
| Males | .003 | .022 | .909 | | |
| Education → Achievement | | | | .065 | .000 |
| Intercept (Females) | .136 | .030 | .000 | | |
| Males | -.010 | .042 | .810 | | |
| Education$^2$ → Achievement | | | | .060 | .001 |
| Intercept (Females) | .003 | .024 | .908 | | |
| Males | -.015 | .034 | .654 | | |
| Occ. Status → Achievement | | | | .033 | .000 |
| Intercept (Females) | .036 | .025 | .150 | | |
| Males | .009 | .035 | .795 | | |
| Occ. Status$^2$ → Achievement | | | | .034 | .011 |
| Intercept (Females) | -.008 | .019 | .694 | | |
| Males | .029 | .027 | .289 | | |

*Note.* Occ. = Occupational; Dep. = Depressive; *SE* = Standard Error; *p = p-value;* $\hat{\tau}^2$ = residual variability; $R^2$ = explained variability between correlations; $\chi^2$ = chi-square of the omnibus test of moderation.

**Table 12**

*Model 2 Parameters for Depressive Symptoms Separated by Race/Ethnicity*

| Exogenous Variables | White | Latinx | Black | Asian American | Native American | Multiracial |
|---|---|---|---|---|---|---|
| | $\beta(SE)$ | $\beta(SE)$ | $\beta(SE)$ | $\beta(SE)$ | $\beta(SE)$ | $\beta(SE)$ |
| Income | -.122(.010)$^{***}$ | -.109(.012)$^{***}$ | -.127(.012)$^{***}$ | -.074(.031)$^{*}$ | -.078(.029)$^{**}$ | -.085(.019)$^{***}$ |
| Income$^2$ | .054(.008)$^{***}$ | .058(.010)$^{***}$ | .059(.010)$^{***}$ | .009(.026) | -.009(.027) | .028(.016) |
| Education | -.101(.009)$^{***}$ | -.055(.012)$^{***}$ | -.127(.011)$^{***}$ | .018(.051) | -.004(.045) | -.062(.029)$^{*}$ |
| Education$^2$ | .040(.006)$^{***}$ | -.025(.008)$^{***}$ | .022(.009)$^{*}$ | -.017(.038) | -.004(.038) | .024(.023) |
| Occ. Status | -.036(.010)$^{***}$ | -.035(.013)$^{**}$ | -.019(.013) | -.128(.063)$^{*}$ | -.071(.036)$^{*}$ | -.043(.020)$^{*}$ |
| Occ. Status$^2$ | .013(.007) | .014(.011) | .016(.012) | .060(.050) | .006(.034) | .014(.017) |
| Dep. Symptoms PW | .492(.009)$^{***}$ | .428(.015)$^{***}$ | .477(.011)$^{***}$ | .295(.030)$^{***}$ | .327(.046)$^{***}$ | .487(.023)$^{***}$ |

*Note.* Double dashes indicate that the model parameters were not estimated. Occ. = Occupational; Dep. = Depressive; PW = Prior Wave. *SE* = Standard Error.
$^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

**Table 13**

*Model 2 Parameters for Academic Achievement Separated by Race/Ethnicity*

| Exogenous Variables | White | Latinx | Black | Asian American | Native American | Multiracial |
|---|---|---|---|---|---|---|
| | $\beta(SE)$ | $\beta(SE)$ | $\beta(SE)$ | $\beta(SE)$ | $\beta(SE)$ | $\beta(SE)$ |
| Income | .148(.024)*** | .088(.019)*** | .052(.027) | .140(.042)*** | .023(.069) | .151(.035)*** |
| Income$^2$ | -.079(.023)*** | .003(.017) | -.007(.024) | -.013(.033) | .063(.060) | -.048(.033) |
| Education | .150(.044)*** | .078(.044) | .179(.035)*** | .128(.181) | .141(.132) | .099(.049)* |
| Education$^2$ | .040(.033) | -.029(.038) | .011(.029) | -.132(.129) | .037(.102) | -.056(.042) |
| Occ. Status | .054(.035) | .026(.032) | -.008(.038) | .088(.014) | -.031(.156) | .100(.045)* |
| Occ. Status$^2$ | -.004(.026) | .013(.024) | .017(.029) | .112(.066) | .070(.128) | -.016(.042) |
| Achievement PW | .600(.018)*** | .503(.027)*** | .434(.027)*** | .414(.123)*** | .171(.173) | .514(.052)*** |

*Note.* Double dashes indicate that the model parameters were not estimated. Occ. = Occupational; PW = Prior Wave. *SE* = Standard Error.
*$p < .05$. **$p < .01$. ***$p < .001$.

**Figure 1**

*Conceptual Model Linking Socioeconomic Status to Human Development*

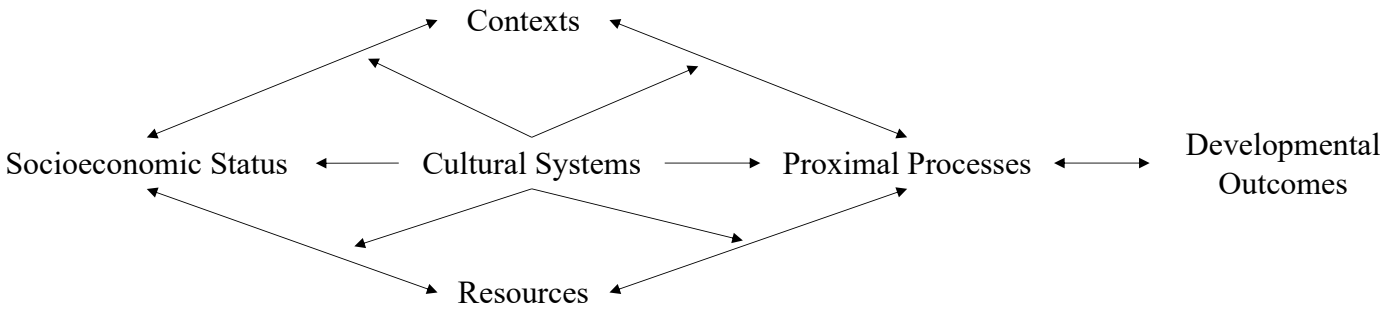
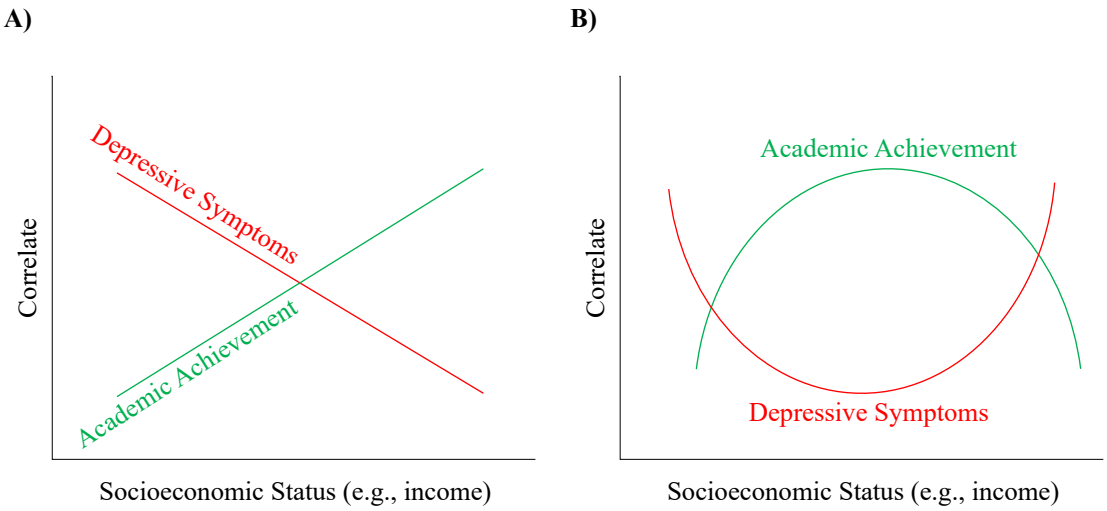


**Figure 2**

*Conceptual Depiction of the A) More is Always Better (i.e., Monotonic, Linear) and B) Better is Somewhere in the Middle (i.e., Nonmonotonic, Quadratic) Model of Socioeconomic Status*

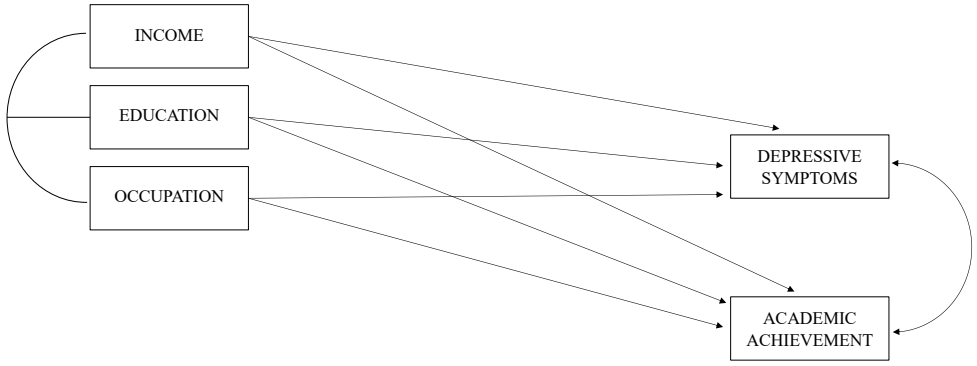



*Note.* This is a simplified representation of what these patterns may look like. It is possible that the pivot point for the quadratic association is at a different level of socioeconomic status than shown for academic achievement or depressive symptoms. This possibility is depicted by the slight shift in placement of the quadratic associations in panel B.

## Figure 3

*Model 1 (Monotonic; More is Always Better) and Model 2 (Nonmonotonic; Better is Somewhere in the Middle) Represented in Path Diagrams.*

**Model 1**




**Model 2**

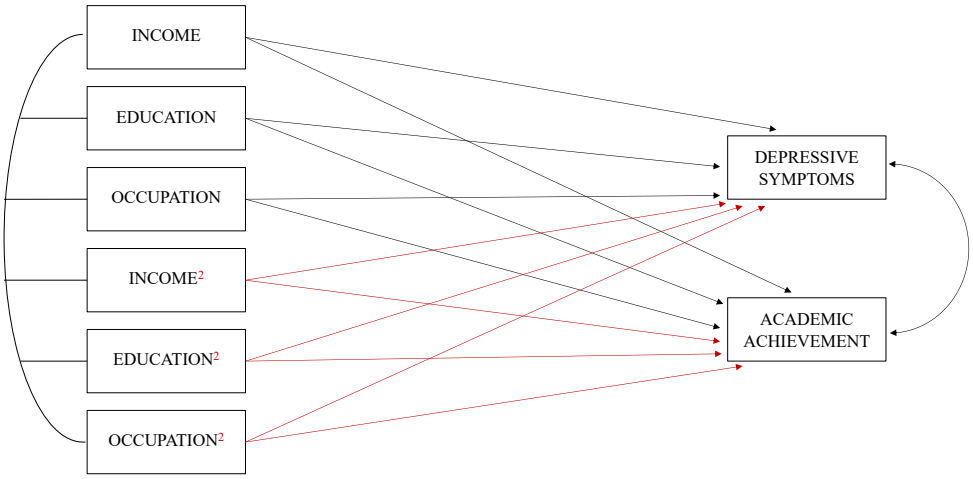
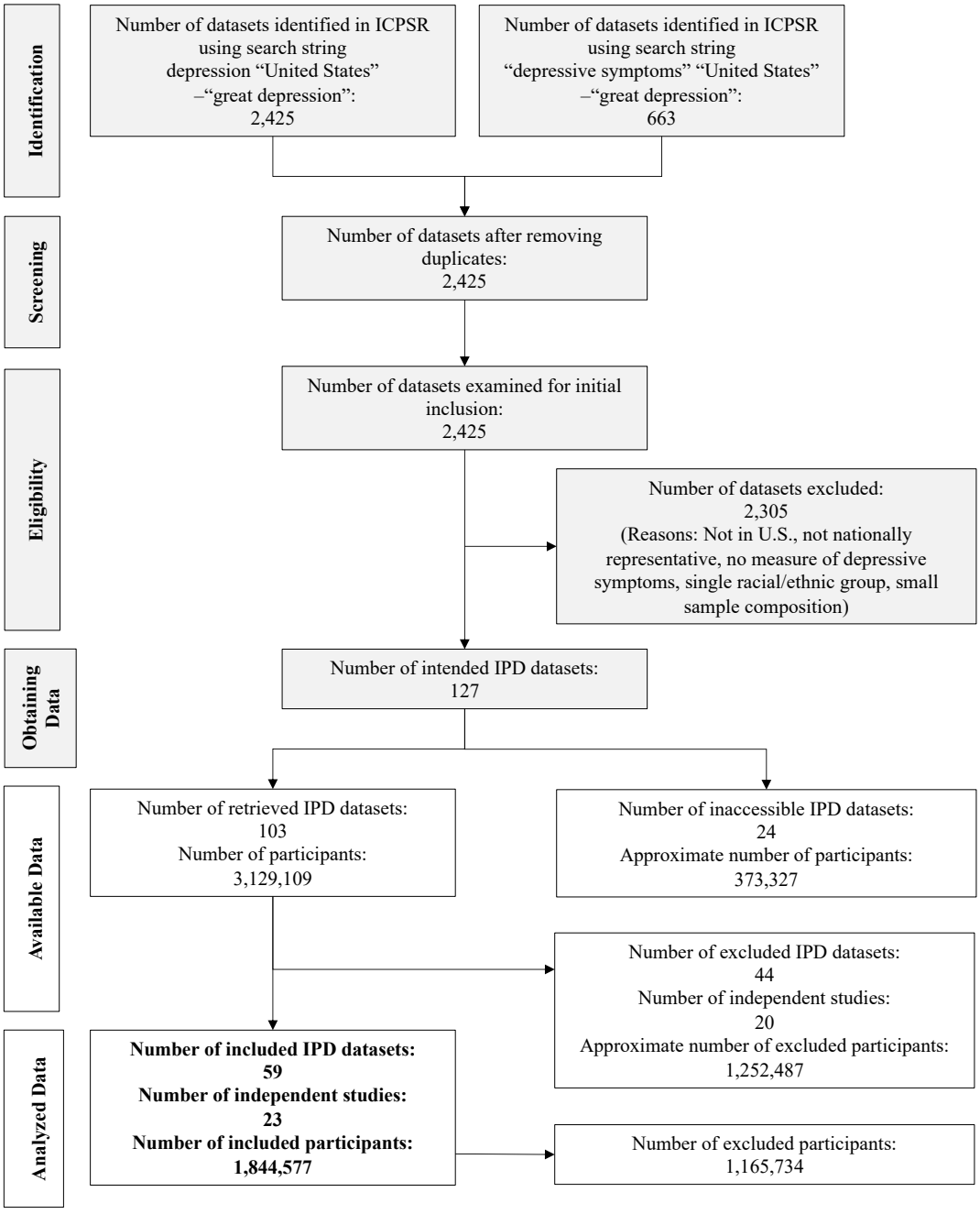


**Figure 4**

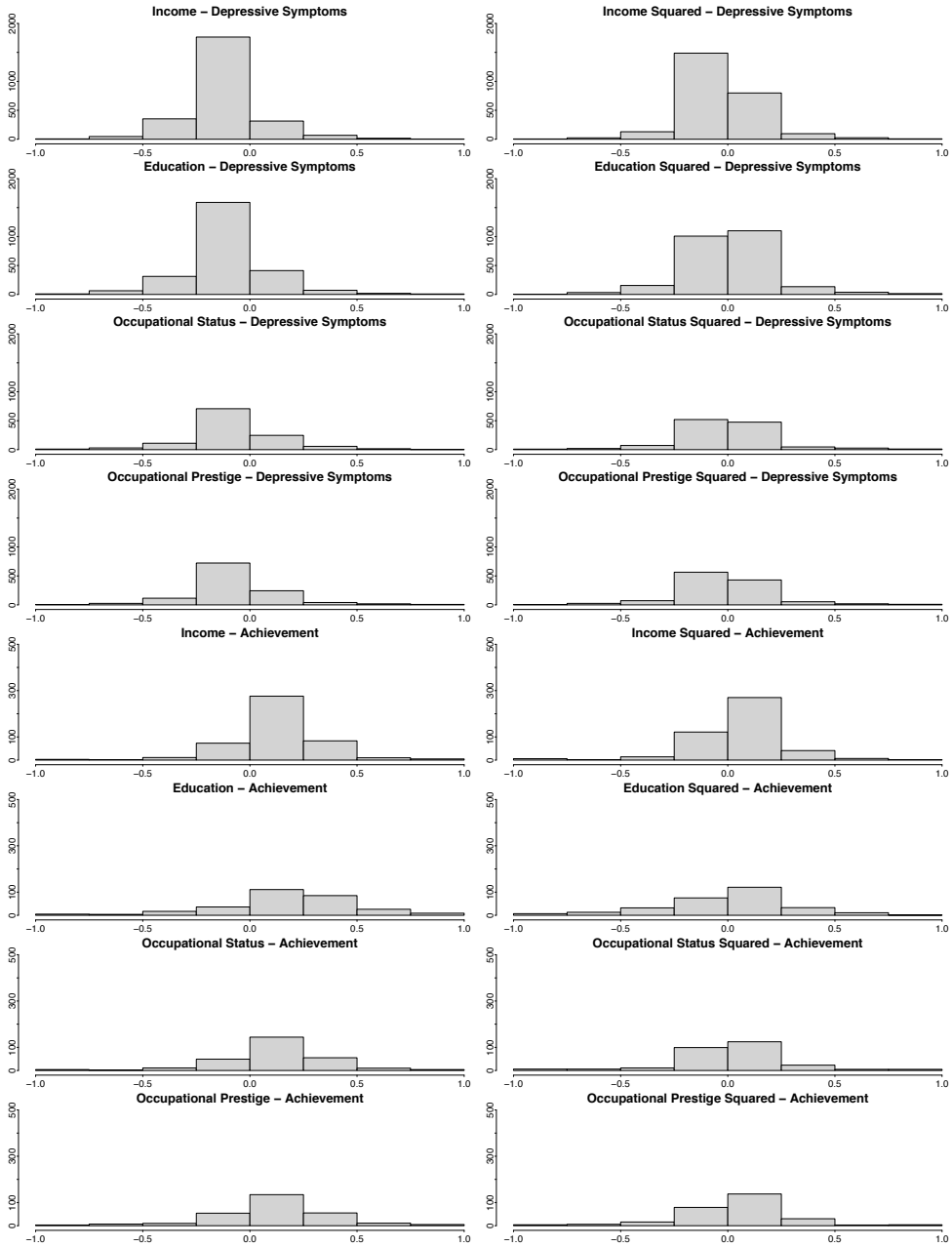
*Flow Diagram of the Inclusion and Exclusion Process*




*Note.* The shaded boxes were part of the initially identified IPD datasets by Causadias et al. (2018b). The unshaded boxes indicated the inclusion and exclusion process applied in the present study.

**Figure 5**

*Histogram Plots for Correlations Between Focal Variables*

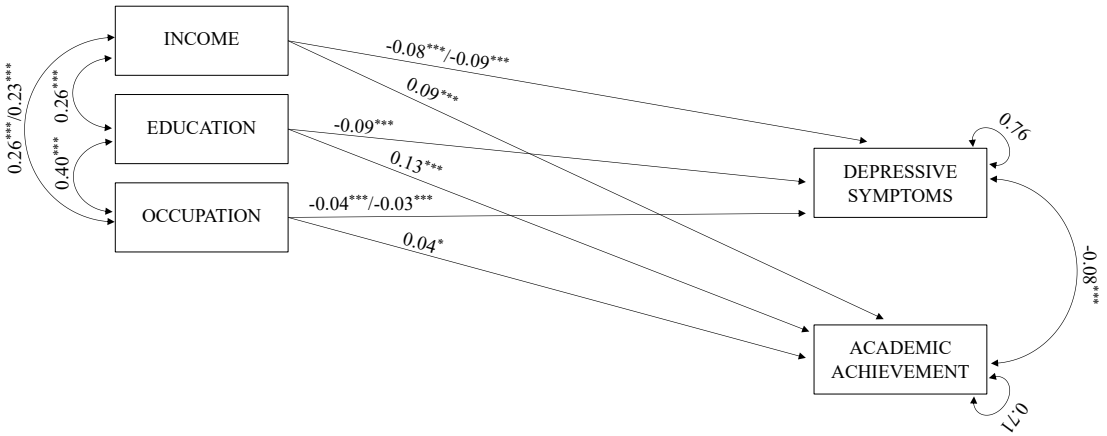



*Note.* The histograms in this figure show the distribution of correlations by direction and magnitude across all datasets. The x-axis is Pearson's r, which ranges from -1.0 to 1.0. The y-axis is the frequency; the y-axis range is different for correlations with depressive symptoms and correlations with achievement because there were fewer correlations with achievement.

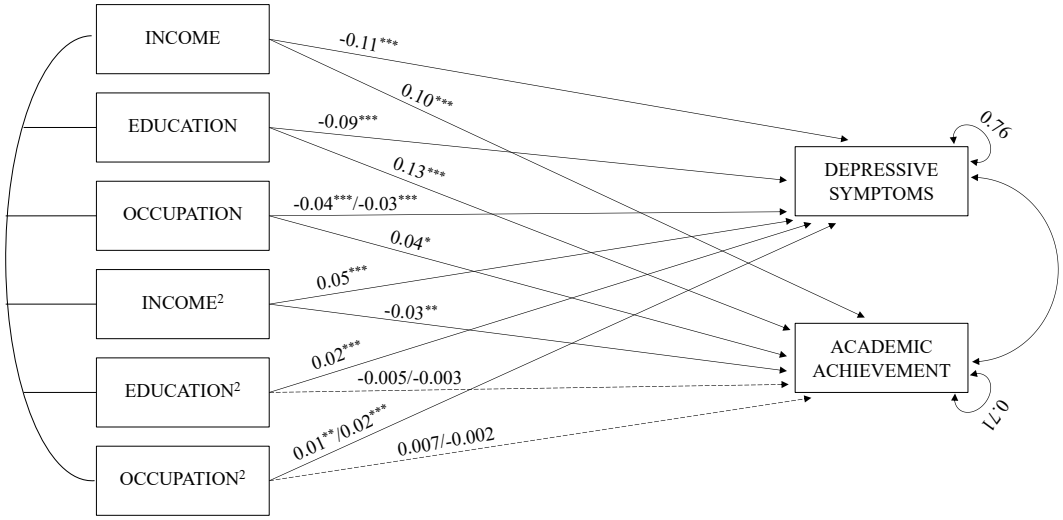
## Figure 6

*Parameter Estimates for Model 1 and Model 2 Represented in Path Models*

**Model 1**



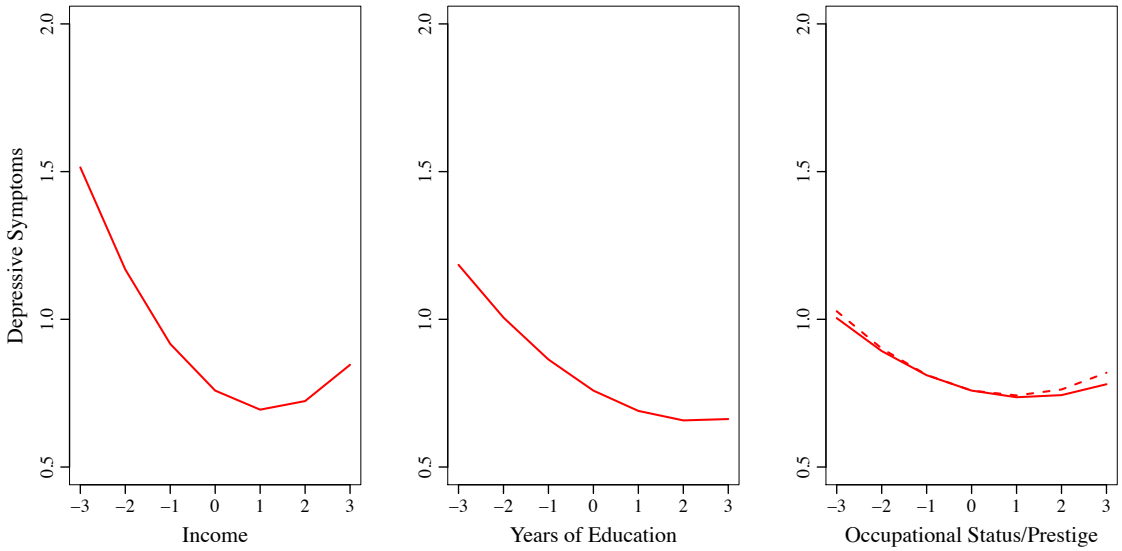

**Model 2**




*Note.* In Model 1 and Model 2, the prior wave of depressive symptoms and academic achievement were included as covariates, but they are not depicted. All correlations shown in Model 2 were significant, but they are not depicted. Parameter estimates separated by a slash indicate that the parameter was different when occupational status (left of slash) was included compared to when occupational prestige (right of slash) was included. Dotted lines represent non-significant paths.
$^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

**Figure 7**

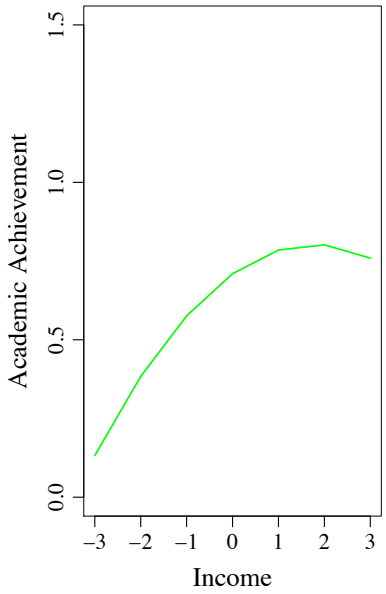
*Depiction of the Quadratic Patterns of Association with Depressive Symptoms for Income, Years of Education, and Occupational Status and Prestige Across All Samples*




*Note.* The curvilinear line is predicted based on the path estimates from Model 2. For occupational status/prestige the solid line is for occupational status and the dotted line is for occupational prestige.

**Figure 8**

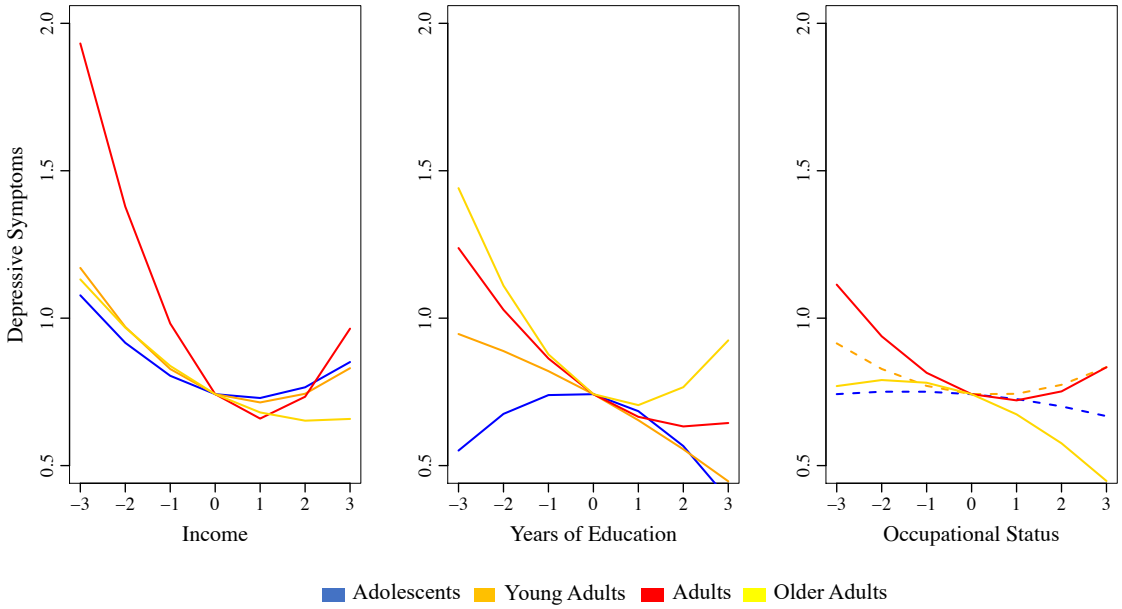
*Depiction of the Quadratic Pattern of Association Between Income and Academic Achievement Across All Samples*




*Note.* The curvilinear line is predicted based on the path estimates from Model 2.

**Figure 9**

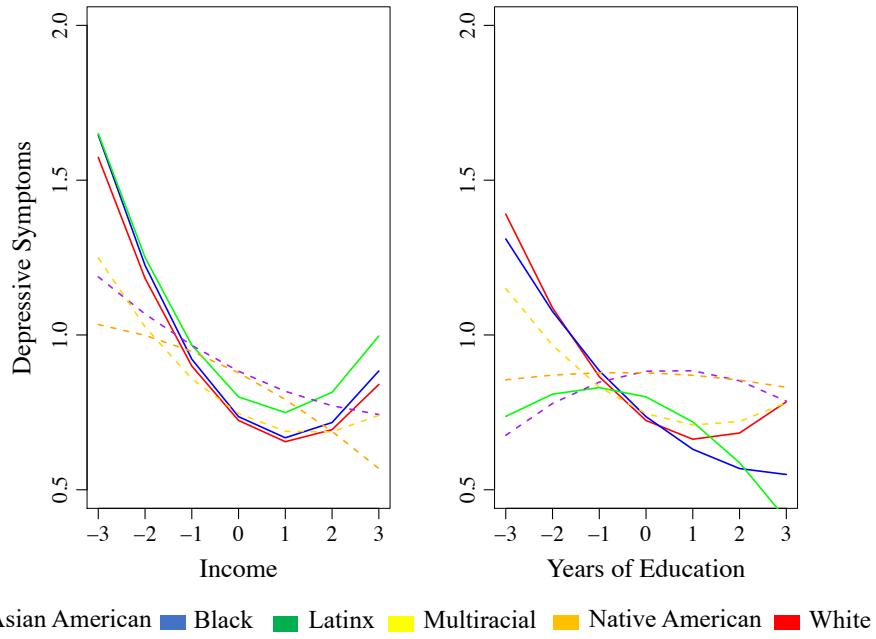
*Depiction of the Quadratic Patterns of Association with Depressive Symptoms for Income, Years of Education, and Occupational Status Disaggregated by Developmental Period*




*Note.* The curvilinear line is predicted based on the path estimates in Table 10. Solid lines indicate that the quadratic association for the specific developmental period is significantly different from adults (red line) whereas the dotted lines indicate that the specific developmental period is not significantly different from adults.

**Figure 10**

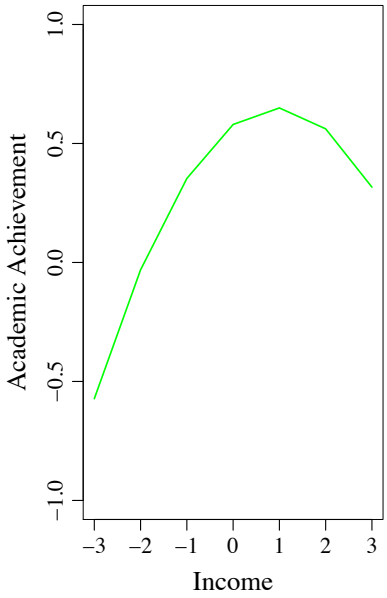
*Depiction of the Quadratic Patterns of Association with Depressive Symptoms for Income, Years of Education, and Occupational Status Disaggregated by Race/Ethnicity*




*Note.* The curvilinear line is predicted based on the path estimates in Table 12. Solid lines indicate that the quadratic association is significant whereas the dotted lines indicate that the quadratic association is not significant.

**Figure 11**

*Depiction of the Quadratic Pattern of Association Between Income and Academic Achievement among White Samples*




*Note.* The curvilinear line is predicted based on the path estimates in Table 13.