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A Symphony Within: An Investigation of Positive Mental Health, Access to the Arts, and Equity in Millennials During Adolescence and Young Adulthood

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A Symphony Within:

An Investigation of Positive Mental Health, Access to the Arts, and Equity in Millennials During Adolescence and Young Adulthood

A dissertation submitted in partial satisfaction of the requirements for the degree Doctor of Philosophy in Health Policy and Management

by

Eryn Piper Block

2021

ABSTRACT OF THE DISSERTATION

A Symphony Within:

An Investigation of Positive Mental Health, Access to the Arts, and Equity in Millennials During Adolescence and Young Adulthood

by

Eryn Piper Block

Doctor of Philosophy in Health Policy and Management

University of California, Los Angeles, 2021

Professor Frederick J. Zimmerman, Chair

Positive mental health is an important predictor of favorable life outcomes, and arts participation is one hypothesized driver of promoting positive mental health. This four-part dissertation investigates trends in positive mental health in young adulthood, access to arts education in public secondary schools, and the relationship between performing arts and positive mental health for young adults.

Papers 1 and 2 use the Population Study of Income Dynamics (PSID) to examine potential predictors and moderators of positive mental health. Paper 1 finds that most role transitions that have historically defined young adulthood (moving out of the family home, becoming the head of household, and having children) are not significantly associated with positive mental health. After controlling for time-invariant, individual characteristics, only employment status and marital status

remained significant predictors. In Paper 2, results show that Black young adults who turned 18 around 2002 had substantially higher levels of positive mental health than their white or Latinx peers, but levels of positive mental health for individuals of different racial/ethnic backgrounds are converging over time. Paper 2 also finds that income is positively associated with positive mental health for white and Latinx individuals but is negatively associated with positive mental health for Black individuals.

Using the Schools and Staffing Survey (SASS), Paper 3 investigates whether a federal education policy, No Child Left Behind (NCLB), led to a decrease in the availability of arts education in US public secondary schools, and examines equity of access across student race/ethnicity and income. Results suggest a general decline in the availability of arts education from 2000 to 2012, but this decline is not linked to the introduction of NCLB. Results also suggest that high-income and predominantly white schools offer more arts education than low-income schools and those serving predominantly students of color.

Also using the PSID, Paper 4 examines the potential relationship between participation in performing arts and positive mental health in young adults. Using individual-level fixed effects across three waves of data per individual, this study finds that an increase in frequency of participation in performing arts is associated with an increase in positive mental health. The study also finds that people of color and low-income individuals are less likely to participate in performing arts, but when they do participate, people of color have similar, if not higher, associations between participation and positive mental health than their white peers.

Overall, these studies contribute to the literature in several ways. They are the first, to my knowledge, to investigate trends in positive mental health for a general young-adult population (not just college students), access to arts education in a nationally and state representative sample, and the relationship between performing arts and positive mental health. This dissertation provides evidence

that inequities exist in the availability of arts education in secondary schools and in participation of performing arts in young adulthood, suggesting the need for greater investment in access to the arts in low-income communities and communities of color.

The dissertation of Eryn Piper Block is approved.

Kelly Gonez

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2021

For Mr. Ingram, who helped me discover the magic of music.

"There is a reason you glance up when you first hear a melody,
or tap your foot to the sound of a drum.
All humans are musical.
Why else would the Lord give you a beating heart?"

(Albom, 2015, p. 4)

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Completing this dissertation has taken a village. As I've worked to bring this project to life, I have been surrounded by the support, love and encouragement of many. To my father, thank you for being my first teacher and my closest friend, and for opening up my mind to the frontiers of knowledge. To my mother, thank you for always, always believing in me and giving me the space to explore the world, while offering me a safe place to come home to. To my brother, thank you for showing me what really matters in life. To Tom, you helped me get to where I am today. Thank you for reminding me that no matter what, there always remain reasons to spontaneously break into song.

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VITA

Eryn Piper Block received a Master of Public Policy with a concentration in Quantitative Research Methods from Vanderbilt University's Peabody School of Education and a Bachelor of Arts in German and International Studies from the University of Oregon Clark Honors College. From 2012-2014, Eryn taught middle school science in Baton Rouge, Louisiana as a Teach for America Corps Member. As a PhD student, Eryn worked as a Graduate Student Researcher for the UCLA Center of Healthier Children, Families and Communities from 2017-2020, and previously worked as a Graduate Student Researcher while in her master's program. She served as the President of the Palms Neighborhood Council from 2019-2021. Eryn has co-authored three peer-reviewed journal articles, one book chapter and presented at six research conferences.

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Chapter 1: Introduction

"*Our biological rhythms are the symphony of the cosmos, music embedded deep within us to which we dance, even when we can't name the tune*," (Deepak Chopra, 2011)

"*Music was my refuge. I could crawl into the space between the notes and curl my back to loneliness*," (Maya Angelou)

INTRODUCTION

What constitutes good mental health? Is it the prevention or, at least, successful management of mental illness? Intuitively, it may seem clear that good mental health involves a great deal more – a sense of belonging and purpose, the space to know oneself fully, and the safety to express oneself. The absence of these conditions can be intensely painful and distressing, yet aimlessness, isolation and the concealment of one's true self are not mental illnesses. Instead, they represent a scarcity of the attributes of positive mental health. Positive mental health is a loosely correlated, complementary construct to mental illness. Both constructs are important for understanding complete mental health, but the treatment of mental illness receives substantially more attention and scholarship. This dissertation investigates positive mental health trends for young adults and one potential promoting factor of positive mental health: participation in the arts. This dissertation also investigates issues of equity, both in positive mental health trends and in opportunities for arts participation.

Chapters 2 and 3 provide new insights into patterns of positive mental health in young adults. Specifically, Chapter 2 investigates whether life transitions traditionally associated with young adulthood, such as leaving the family home, starting a career, and forming a romantic partnership, predict positive mental health for Millennials. The Millennial Generation has, in many ways, redefined the transition to adulthood, completing these life transitions at a different tempo or in a different sequence compared to past generations or choosing not to complete them at all (Bonnie et

al., 2014; Clifton, 2016). This chapter finds evidence that positive mental health is strongly related to whether an individual is a student, employed, or unemployed, but does not find evidence of a strong relationship between other life transitions and positive mental health.

Chapter 3 investigates whether the trend in previous studies of adults, that Black[1] individuals tend to have higher levels of positive mental health than other racial/ethnic groups, is similar for young adults, in total and across time (Keyes, 2009a; Ryff et al., 2003). Results show that this trend is similar for early cohorts of young adults (those who turned 18 around 2002) but with later cohorts, positive mental health levels between racial/ethnic groups are converging. Additional evidence suggests that income level is a stronger determinant of positive mental health for white and Latinx individuals compared to Black individuals.

A hypothesized pathway through which positive mental health is promoted is participation in the arts. Chapter 4 investigates the availability of arts education in public secondary schools over two decades (1994-2012) and with the introduction of No Child Left Behind, a major federal education policy that arguably influenced school practices more than any previous policy at the federal level (Elpus, 2014). The main findings for Chapter 4 are as follows: 1) high income and predominantly white schools have greater access to arts education than low income schools and those predominantly serving students of color, 2) while the study does not find evidence that NCLB impacted the availability of arts education directly, there is evidence of a downward trend in the availability of arts education in public secondary schools after 2000, and 3) there is no evidence that NCLB had beneficial outcomes for low-income students and students of color in terms of arts

[1] Throughout this dissertation, I capitalize Black but not white as descriptors of racial groups. Black represents a group of people that shares many histories and cultures, while white represents a social construct stemming chiefly from colonization, oppression and power, more as a negation of other groups of people than a descriptor of a group with shared experiences and culture (Dumas, 2016).

education availability. Chapter 4 also concludes that data availability limitations heavily constrain the ability of researchers to describe and understand availability and equity in arts education.

Chapter 5 integrates the study of positive mental health and arts participation, investigating associations in young adults for positive mental health and different types of arts participation (performing arts vs. visual arts and writing). Frequent participation in performing arts meaningfully predicts higher levels of positive mental health. Chapter 5 also includes an investigation of equity of participation by income, race/ethnicity and gender. White and high-income young adults are significantly more likely to participate in performing arts, but when they do participate, the magnitude of the association between performing arts and positive mental health is similar if not greater for people of color compared to white individuals. No gender differences were found.

This dissertation makes several novel and important contributions. It provides novel insights into patterns of positive mental health for young adults. It is the first inquiry, to my knowledge, into positive mental health for young adults with a large sample that includes both college students and those not in school, and to investigate time trajectories in positive mental health for young adults. This dissertation also provides novel insights by examining changes in arts education availability over time using a large dataset representative at the national and state level. Finally, this dissertation illuminates our understanding of the relationship between positive mental health and performing arts for young adults. More generally, this dissertation contributes to the public health and mental health literature by continuing the much-needed discussion on a salutogenic framing of health, a solutions orientation in policy work, and attempting to employ an equity-focused lens.

POSITIVE MENTAL HEALTH

The US Department of Health and Human Services defines mental health as "a state of successful performance of mental function, resulting in productive activities, fulfilling relationships

with people and the ability to adapt to change and to cope with adversity," (1999). To attain complete mental health of this kind, the promotion of positive mental health is an important complement to the prevention and management of mental illness. There are two major theoretical origins of positive mental health: Hedonic Wellbeing and Eudaimonic Wellbeing. The Hedonic tradition of emotional wellbeing focuses on feeling happy, interested and satisfied in life and can be traced by to the Greek philosophy of hedonism (Waterman, 1993). There has been significant research focusing only on emotional wellbeing as an outcome (Branagan, 2017; Diener et al., 1999; Diener & Suh, 1997; Gariepy et al., 2017; Greenspoon & Saklofske, 2001; Luhmann et al., 2012; Ronen et al., 2016; Steel et al., 2008) but it has been criticized as too narrow a conceptualization of positive mental health.

Following these criticisms, Eudaimonia, or psychological wellbeing, emerged as a complementary construct. Eudaimonia centers around an individual's functioning and can be traced back to Aristotle, who viewed the highest virtue as "growth toward realization of one's true nature," and the Greek virtues of self-truth (to "know thyself") and realizing ones intrinsic potential (to become who you are) (Keyes & Annas, 2009; Ryff, 2017, p. 243). The conceptualization of positive mental health used in this dissertation attempts to synthesize the Hedonic and Eudaimonic traditions of wellbeing with Diener's studies of emotional wellbeing (Diener et al., 1999; Keyes, 2002), Ryff's work on psychological wellbeing (Ryff, 1989), and Keyes' conceptualization of social wellbeing (Keyes, 1998), one of the only positive mental health measures to do so (Rose et al., 2017).

Positive mental health is predictive of several later life outcomes, though this scholarship focuses primarily on general adult or adolescent populations, not young adults. Levels of positive mental health predict later mental illness. In a study of Dutch adults (N=4482), those with high positive mental health at Time 1 were significantly less likely to have any mood disorder at Time 2 (around 3-5 years later) (Schotanus-Dijkstra et al., 2017). The relationship between mental illness and

positive mental health appears to be bi-directional, at least in the short term. In a study of Dutch adults (N=1932) with four waves of data collected over 9 months, the change in level of mental illness was not only significant but more predictive of later positive mental health than the baseline level of mental illness (Lamers et al., 2015).

Positive mental health is predictive of higher levels of health and daily functioning in adolescent, college student and general adult populations. For adolescents, those with complete mental health had better reading skills, attendance, academic self-perception, academic goals, social support from peers and parents, self-reported physical health and fewer problems with peers (Suldo & Shaffer, 2008). For college students who did not screen positive for a mental illness, lower levels of positive mental health predicted higher suicidal behavior and worse academic performance (Keyes et al., 2012).

Adults who have low mental illness and high positive mental health tend to have the most optimal physical health and social functioning outcomes, and even with low mental illness, those with low positive mental health generally have less favorable outcomes. For instance, in a cross-sectional study of 26,000 Canadian adults, similar proportions of adults with no mental illness but low positive mental health (22 percent) and adults with mental illness but with moderate positive mental health (26 percent) indicated having substantial daily limits to activities (Gilmour, 2015). Conversely, only 12 percent of those with high positive mental health and no signs of mental illness indicated any daily activity limits (Gilmour, 2015).

In a large sample of US adults ages 25-74, those with complete mental health (low mental illness, high mental health) had highest levels of productivity and lowest levels of health care use (Keyes & Grzywacz, 2005). Over a 10-year period in a sample of US adults, those with low or moderate positive mental health had higher mortality rates than those who with high positive mental health (OR=1.62) (Keyes & Simoes, 2012). For individuals with physical illness, emotional wellbeing

had a small but significant relationship with quality and speed of recovery (Lamers, Bolier, et al., 2012). Positive mental health appears to mediate the relationship between chronic pain and activity restriction – studies suggest that those with higher positive mental health have less activity restriction controlling for the level of chronic pain (Gilmour, 2015).

A question remains within the field of positive psychology whether positive mental health is a relatively stable, individually engrained construct or whether environmental or behavioral shifts can permanently impact baseline levels of positive mental health. It is critical to understand these mechanisms because it informs us to what extent positive mental health can be intervened upon and promoted through environmental or policy changes. Most of this inquiry has focused on emotional wellbeing, one of the three main constructs in positive mental health.

Until recently, set point theory prevailed, suggesting that emotional wellbeing in particular is a stable construct driven by genetics and personality, changing only briefly and temporarily due to major life events (Diener et al., 1999; Lykken & Tellegen, 1996). However, more recent studies have challenged the validity of this theory with substantial discordant data, suggesting instead an event-oriented theory, that both life events and habit changes can substantially and permanently impact emotional wellbeing (Soons & Liefbroer, 2009). In a large US adult sample, over a 10-year period, individuals experienced substantial changes to their levels of positive mental health. Though population-level estimates remained steady, around half of those with high positive mental health and those with low positive mental health in 1995 changed categories in 2005 (Keyes et al., 2010). A longitudinal study of adults showed that individuals had many different emotional wellbeing trajectories, including stable, linear increasing, linear decreasing, U-shaped, and reverse U-shaped (Soons & Liefbroer, 2009). A 20-year longitudinal study of German adults showed that around 20 percent of individuals had substantial and long-term changes to emotional wellbeing (Headey, 2007). Specifically, a small portion of the sample had large declines and a larger portion of the sample had

small increases in emotional well-being. Thus, population-level averages evened out over time. In adolescents, there is also evidence of malleability of emotional wellbeing at the individual level. In a study of 425 high school students over a 1-year period, 40 percent of the adolescent sample changed in category of emotional wellbeing (McMahan, 2013). Those in the high emotional wellbeing category were most likely to stay in their category (80 percent) and the symptomatic but content group (high emotional wellbeing and high mental illness) had the least stability (17 percent) (McMahan, 2013). Event-oriented theory would suggest that environments matter to the emotional wellbeing and could potentially be extrapolated more broadly to positive mental health.

FRAMING

The remainder of this introduction includes important framing for the dissertation. Specifically, it lays out the values with which this dissertation was formed, including anti-racism and asset-based scholarship, and provides context through which to view positive mental health – as a complex, imperfect and context-specific construct rather than simply offering an antithesis to mental illness.

Asset-based Narratives and Structural Solutions

With research comes responsibility. While a tacit belief in academia suggests that knowledge generation is inherently benevolent or positive, history has shown how harmful research has the potential to be. As Smith writes, "belief in the ideal that benefiting mankind is indeed a primary outcome of scientific research is as much a reflection of ideology as it is of academic training. It becomes so taken for granted that many researchers simply assume that they as individuals embody this ideal and are natural representatives of it…" (Smith, 2013, p. 16). Research is a powerful tool, but it can also be a weapon – it can and often does reproduce the oppressive power structures present in our society. This is not only true for infamous, horrific examples like the Tuskegee

syphilis study (Corbie-Smith, 1999), but also in more mundane, everyday racist practices. This dissertation does not centrally focus on issues of systemic racism. Rather, it acknowledges that racism is woven into every social phenomenon and thus, any study must question the ways that racism and other oppressive forces show up in the content of interest (Boyd et al., 2020; Kendi, 2019). Careful practices of anti-racism should not only be the responsibility of departments or studies specifically focused on race and racism, but rather incorporated as core values in all types of research (Gorski, 2008; Rafael, 1993; Shahjahan, 2011; Shiva, 2016).

One harmful practice to be aware of and avoid is the promotion of a deficit narrative for communities of color and low-income communities. Social research tends to oversimplify and fixate on inequities between communities and deficits within communities, inaccurately painting structural inequities as individual deficits. This creates a false sense that certain communities, especially Black and Brown communities, are places only of anguish and despondence. This narrative does not acknowledge the agency, resilience, ingenuity, and joy that can be found within all communities. This has been called 'damage centered scholarship', which perpetuates "a cycle of deficiency and pathology about marginalized communities," (Baldridge, 2014, p. 440). It inadvertently dehumanizes communities and further espouses the narrative that individuals in such communities need to be saved (Roy, 2017). This narrative is so deep within the fields of education and academia that it is difficult for programs that serve Black and Brown youth and young adults to receive funding if they do not play into the deficit narrative about their members (Baldridge, 2014).

Mental health scholarship focuses heavily on the presence of trauma and the treatment of mental illness, as well as illustrating inequities in access to treatment. Though a critical line of inquiry, this can create the illusion of a one-dimensional existence of individuals that suffer from trauma or mental illness. As Ginwright writes, "the term trauma-informed care runs the risk of focusing on the treatment of pathology (trauma), rather than fostering the possibility (well-being),"

(Ginwright, 2020). Especially in consideration of Black and Brown youth, Ginwright suggests a shift from trauma-informed to healing-centered (Ginwright, 2015). He writes that "a healing-centered approach to addressing trauma requires a different question that moves beyond 'what happened to you' to 'what's right with you' and views those exposed to trauma as agents in the creation of their own well-being rather than victims of traumatic events," (Ginwright, 2020). This dissertation attempts to partially address this criticism of mental health scholarship by expanding the discussion of positive mental health rather than focusing on the presence of mental illness or trauma.

There is also a dearth of research on structural differences in resources available to communities and contextual drivers of inequity. If solutions are offered, they are often at the individual level, suggesting behavior changes, versus a careful look at what resources are available to which communities (and even better, understanding why these resource discrepancies exist in the first place). This dissertation attempts to address these two criticisms by looking at a health asset (positive mental health) and a community or structural-level resource (access to the arts).

Providing Context for Positive Mental Health: Second-Wave Positive Psychology

Positive psychology offers a useful complement to the study and treatment of mental illness. Yet positive mental health should be viewed as a complex construct within a community context, not simply the inverse of mental illness. The original three pillars of positive psychology were positive subjective experience, positive individual characteristics, and positive institutions and communities (Lomas, 2016a). Though these pillars were said to have equal importance, the vast majority of research in positive psychology focuses on the first two pillars (Lomas, 2016a). Positive institutions and communities, the systems-level factors, have often been ignored. This dissertation attempts to address contextual issues of positive mental health by looking at access to a potential promoter of positive mental health: participation in the arts. Where positive mental health is studied

on an individual level, the dissertation attempts to use language that acknowledges the importance of community, social, and political contexts that impact individual-level mental health.

Positive psychology and the scales used in this dissertation can be misconstrued and oversimplified in harmful ways. Second Wave Positive Psychology takes a more critical approach, adding important context and nuance to the understanding of how positive mental health fits into complete mental health (Lomas, 2016a). There are four tenets of Second Wave Positive Psychology, which offer useful framing for this dissertation: appraisal, covalence, complementarity and evolution.

Appraisal "cautions against categorically identifying a phenomenon as either positive or negative, since such appraisals are fundamentally contextually dependent," (Lomas, 2016a, p. 3). The tenet of Appraisal suggests that no feeling, emotion or mental state is inherently or eternally good or bad. There are many contexts in which difficult emotions such as anger or sadness are important and valid given the situation. For instance, the feeling of righteous anger can be a catalyst for societal change (Siegel, 2009). The goal of the inquiry into positive psychology is not to create a world in which individuals only experience so-called positive emotions like happiness and contentment. Rather, the goal is to offer a more complete picture of what may contribute to comprehensive mental wellbeing.

Co-valence builds on the issue of appraisal by arguing that many emotional experiences are a complex mixture of positive and negative, light and dark (Lomas & Ivtzan, 2016). Since the world is an inherently complex place, so too must our emotional dynamics be.

Complementarity describes how this duality of light and dark is the essence of the deep emotions we feel, and the stronger we feel the positive, light emotions, the more potential we have to feel the negative, dark emotions and vice versa. Additionally, these opposites are not static but rather constantly moving from one end to the other in a "ceaseless process of becoming," (Lomas, 2016a, p. 3). As Kahlil Gibran writes,

"Your joy is your sorrow unmasked.
And the selfsame well from which your laughter rises was oftentimes filled with your tears.
And how else can it be?
The deeper that sorrow carves into your being, the more joy you can contain," (Gibran, 1923, p. 32).

Evolution is a commentary on the emergence of Second Wave Positive Psychology itself, focusing on Hegel's concept of thesis-antithesis-synthesis and the dialectical nature of this inquiry (Lomas, 2016a). Specifically, traditional psychology is the thesis, positive psychology is the antithesis and Second Wave Positive Psychology attempts to synthesize these two lines of inquiry rather than denouncing them.

Ideas such as positive mental health can sometimes be reduced to oversimplistic constructs in quantitative research. Yet, as this discussion of Second Wave Positive Psychology demonstrates, positive mental health is a complex, context-dependent construct.

Positionality Statement

In order to be as thoughtful and responsible as possible, I present my positionality as it relates to the content of this dissertation. "To engage in critical quantitative inquiry, scholars must make their assumptions explicit, articulating how their identities and experiences informed the research process and their interpretation of data" (Duran et al., 2020, p. 137). Though this study does not claim to meet the criteria for critical quantitative inquiry, I attempt to adopt many of its practices and values. As a white woman from a low-income background, I have experienced both privileges and barriers in access to art and conditions that promote positive mental health. I acknowledge that, as a white person, I remain ignorant to lived experiences of racism and in my research, carefully attempt to avoid reinforcing structures of oppression that benefit me.

In my adolescence, I was fortunate to have an incredible band teacher who won national band teacher awards. His classes and mentorship changed my life and the lives of many of my peers. In an area where conditions for youth development were unfavorable, this teacher gave his students hope, an understanding of discipline and excellence, and a deep appreciation of jazz. As a former teacher myself, serving students of color, I saw many of my students come alive and be deeply inspired by the music and dance they participated in, and the devastation when those courses were discontinued due to budget cuts.

Thus, I have anecdotally experienced and observed the transformative power of participating in performing arts and am interested in investigating whether a rigorous examination of participation in arts and mental health yields similar results.

Chapter 2:
Positive Mental Health and Life Milestones During the Transition to Adulthood in Millennials

ABSTRACT

The transition from adolescence to adulthood is an important period for promoting and supporting mental health and a time traditionally associated with a series of life milestones such as leaving the family home, starting a career, finding a romantic partner, and having children. However, the Millennial generation has redefined the pace, sequence and general importance of these life transitions. This study investigates whether these traditional life milestones are associated with positive mental health for a national sample of Millennials in young adulthood over three survey waves (N=5798 person-years, 2030 individuals) using least squares and individual-level fixed effects linear regression models with weighted effect coding. Results suggest that students have consistently higher levels of positive mental health than employed individuals, and the unemployed have consistently lower levels of positive mental health than employed individuals or students. With fixed effects, few other results remain statistically significant at the $p<0.05$ level except slightly lower positive mental health for divorced individuals and slightly higher emotional and psychological wellbeing for individuals cohabitating with a partner. Thus, there is little evidence that traditional life transitions during young adulthood are related to positive mental health for Millennials, other than employment status.

INTRODUCTION

A time of many biological, social, and educational shifts, the transition from adolescence to adulthood is both riddled with risks and stocked with opportunity, making it an important period for promoting and supporting mental health. After spending the vast majority of their lives in mandatory K-12 education, young adults are launched into new opportunities, such as higher education or their first full-time jobs. Young adulthood has often been described of as the time of major role transitions – moving out of the family home, attending postsecondary education, finding a career, finding a romantic partner, and having children (Bonnie et al., 2014). Yet this has always been an inadequate understanding of young adulthood and younger generations are further redefining the pace, sequence and importance of these milestones (Clifton, 2016). Since young adulthood is a developmental period that sets the trajectory for adulthood in general, and younger generations are experiencing this period in new and different ways, it is important to better understand and monitor the relationship between mental health and life changes for current young adults. This study investigates to what extent traditional life milestones are related to positive mental health.

BACKGROUND

Positive Mental Health

Complete mental health encompasses both mental illness and positive attributes of mental health. Broadly conceptualized, positive mental health comprises attributes such as life satisfaction, happiness, purpose, and belonging. Studies suggest that mental illness and positive mental health are not simply two ends of the same spectrum but rather two separate, modestly correlated constructs that both contribute to complete mental health (Antaramian et al., 2010; Greenspoon & Saklofske, 2001; Keyes, 2005, 2009b, 2013; Lamers et al., 2011; Suldo & Shaffer, 2008).

In adolescence, higher levels of positive mental health have been found to be associated with attendance, academic achievement, and positive social interactions (Suldo & Shaffer, 2008). In college students, higher positive mental health has been found to predict lower levels of suicidality and higher levels of academic achievement (Keyes et al., 2012). For adults, higher positive mental health predicts higher productivity and lower health care use (Keyes & Grzywacz, 2005), lower likelihood of daily activity limits (Gilmour, 2015), and even lower mortality rates (Keyes & Simoes, 2012). However, little is known about positive mental health or its predictors in young adults.

Role transitions in Young Adulthood

Young adulthood is an important developmental phase, now considered a time of extended adolescence, and a critical period which sets the trajectory of adulthood (Neinstein, 2013). Until recently, scientists thought that brain development mostly ended after adolescence, but recent evidence suggests that the brain continues to develop into early adulthood (Lebel & Beaulieu, 2011; Pujol et al., 1993). While not as rapid or extreme as in childhood or adolescence, significant physiological and psychological changes occur during young adulthood.

The National Academy of Medicine's report on young adulthood outlines five major role transitions– leaving home, completing school, entering the workforce, forming a romantic relationship, and transitioning into parenthood (Bonnie et al., 2014). The report portrays these role transitions as indicators of wellbeing and success for young adults, and that risks may increase for those who do not fulfil such transitions. Some evidence supports this assertion. For instance, young adults who are neither in the workforce nor in school (disconnected youth) are less likely to have health insurance and more likely to be in poverty and be involved in criminal activity than their peers (Belfield et al., 2012).

Young adulthood is generally a time of increased risks and unhealthy behaviors compared to adolescence and adulthood such as obesity, smoking, unintentional injury, and even suicide (Benjamin, 2012; Neinstein, 2013). Additionally, around 75 percent of chronic mental illnesses manifest in early adulthood (Kessler, Berglund, Borges, et al., 2005; Patel et al., 2007; Paus et al., 2008). With this time of increased risk, it is important to understand what might be protective for young adults as they transition into full adulthood.

Millennials, the generation of young adults that make up this study, are not completing the five major role transitions in as consistent or accelerated a fashion as past generations. Millennials are more likely to live with their parents, remain single, and be unemployed than individuals from past generations (Clifton, 2016; Fry et al., 2018; Shierholz et al., 2012). They are delaying having children and are also more likely to have children before or completely without getting married (Fry et al., 2018). Some scholars attribute these changes to the increased cost of college and the difficulty of finding a steady job after high school that can support a family (Bonnie et al., 2014). However, other studies suggest that these changes may also be partially due to a shift in values and desires, toward autonomy, freedom, choice, and purpose as opposed to stability and conformity (Clifton, 2016). It is important to understand whether completing these role transitions contribute to positive mental health as younger generations continue to redefine what it looks like to transition to adulthood.

Role Transitions and Positive Mental Health

Successful completion of role transitions during a developmental period has been theorized to increase emotional wellbeing, a component of positive mental health, and to allow for further successful role transitions in later developmental periods (Havighurst, 1948). Previous studies have tested this theory and found an association between successful role transition completion in

adolescence and early adulthood and components of emotional wellbeing such as happiness and positive self esteem (Schneider, 1980; Schulenberg et al., 2004), as well as psychological wellbeing (Brunstein et al., 1999). A small number of studies have also looked at this relationship over time, finding that success during one time period was related to happiness in a subsequent time period and vice versa (Lyubomirsky et al., 2005). However, a more recent, small, longitudinal study found no relationship between young adult role transitions and later self-esteem (Seiffge-Krenke & Gelhaar, 2008). This study also found that, in general, young adults placed a low level of subjective importance on the completion of these role transitions. Thus, findings on this subject are mixed and may be changing over time due to changing importance of role transitions for younger generations.

Given the evidence that Millennials have a different general set of values and goals than past generations, it is possible that certain life milestones are more important to their mental health than others. Recently, scholars have theorized that two general arenas of important role transitions are love and work (Mayseless & Keren, 2014; Seiffge-Krenke & Luyckx, 2014). Whereas past generations had a more prescribed set of steps (such as buying a house and getting married), love and work look different for Millennials. Thus, this study hypothesizes that Millennials will have stronger connections between positive mental health and the role transitions related directly to love and work than the other, more traditional role transitions.

Current Study and Contribution to the literature

This study will be the first, to my knowledge, to investigate trends in positive mental health for young adults using a large, nationally representative, longitudinal sample that includes both college students and those who are not in school. This study provides new insights into the relationship between role transitions and positive mental health for young adults, and hypothesizes

that role transitions related directly to love and work will be more related to positive mental health than more traditional role transitions.

METHODS

Positive Mental Health and The Mental Health Continuum – Short Form

This study utilizes the Mental Health Continuum – Short Form (MHC-SF) which is widely used and validated, encompassing a broad conceptualization of positive mental health (Hone et al., 2014; Howell et al., 2013; Keyes, 2002, 2005, 2006, 2007; Lamers et al., 2011; Provencher & Keyes, 2011; Robitschek & Keyes, 2009; Westerhof & Keyes, 2010). This measure includes three components of emotional wellbeing, five of social wellbeing and six of psychological wellbeing (see Appendix 2-A for details).

The Mental Health Continuum – Short Form has a high level of construct validity; it is highly correlated with other measures of wellbeing (Scale of Positive and Negative Experiences, flourishing scale, WHO Quality of Life-BREF, Personal Well-being Index Scale-School Going Children) (Singh & Junnarkar, 2015). Additionally, the three subscales of positive mental health correlate moderately (and positively) with positive self-concept, self-determination, perceived closeness to others, overall health and school integration, and moderately (and negatively) with depression. The subscales correlate weakly (and positively) with reading and math skills (Keyes, 2006). Factor analysis for an adolescent sample suggests that emotional, social, and psychological wellbeing fit best as three separate latent constructs with correlations ranging from .57 to .71. A further description of the Mental Health Continuum – Short Form can be found in the Appendix for Chapter 2.

Data

This study uses the Population Study of Income Dynamics (PSID), which began in 1968 and is the longest lasting longitudinal dataset of US households. The original PSID sample is nationally representative and includes roughly 18,000 individuals within about 5,000 families, offering a wide range of economic, social and health information. In the 1968 sample, low-income families were oversampled. In the 1990's, more immigrant families were added so the sample would continue to be nationally representative (Waterman, 1993).

This study employs the Transition to Adulthood Supplement, which stems from the Child Development Supplement. In 1997, up to two children from infants to 12 years old (and their caregivers) per family were randomly selected from the original sample of 2,705 PSID families, and 88 percent were successfully surveyed for the Child Development Supplement (N=3,563 children) (Mainieri, 2006). When the oldest children from the Child Development Supplement turned 18, the Transition to Adulthood Supplement began in 2005. The Transition to Adulthood Supplement includes the following years: 2005, 2007, 2009, 2011, 2013, 2015, and 2017. In 2017, all young adults in the PSID sample were eligible for the Transition to Adulthood Supplement, regardless of whether they were in the Child Development sample. After individuals turn 28, they transition into the main PSID survey. The PSID includes state-level indicators and neighborhood-level geocodes. Appendix 2-B shows tabulations of age by year for observations in the sample to show the rolling inclusion of individuals as they age into and out of the sample. Note that this dataset does not follow the exact same set of individuals over time. Individuals have between one and six observations over the seven waves of data collection. See Appendix 2-C for the full sample size and response rates for each wave of the Transition to Adulthood Supplement.

Sample

The sample includes individuals aged 18-28 years with at least three observations for positive mental health across all available waves of the Transition to Adulthood Supplement. This excludes a small portion of observations (less than four percent) of 17-year-olds and 1,048 individuals with fewer than three waves. It also excludes waves 4, 5, and 6 for individuals with more than three waves. The total sample of person-years is 5,798.

Measures

Mental Health Continuum-Short Form

There are three subscales of positive mental health: emotional, social, and psychological wellbeing (Keyes & Simoes, 2012). Emotional wellbeing includes frequency of 1) happiness, 2) interest in life, and 3) feeling satisfied in the last month. Social wellbeing includes frequency of feeling 1) you have something to contribute to society, 2) a sense of belonging to a community, 3) that society is getting better for people like you, 4) that people are basically good, and 5) the way society works makes sense in the last month. Psychological wellbeing includes frequency of feeling 1) good at managing daily responsibilities, 2) that you have trusting and warm relationships with others, 3) challenged to grow and learn, 4) confident in your own ideas, 5) that you liked your own personality, and 6) that your life has direction in the last month. All items include the following possible responses: 1) never, 2) once or twice, 3) about once a week, 4) 2 to 3 times a week, 5) almost every day, 6) every day. The continuous measure of the Mental Health Continuum – Short Form ranges from 0 to 70.

Mental Illness

The K-6 Non-specific Psychological Distress Scale is a general measure of mental distress used to broadly capture the presence of mental illness (Kessler et al., 2002, 2003). Items include

'how often have you felt' 1) nervous, 2) hopeless, 3) restless or fidgety, 4) everything was an effort, 5) so sad nothing could cheer you up, and 6) worthless 'in the past 30 days.' Answer options include 4=All of the time, 3=most of the time, 2=some of the time, 1=a little of the time, and 0=none of the time. Items are scored and summed. For diagnostic purposes, a score of 13 or higher indicates "sensitivity around the threshold for the clinically significant range of the distribution of nonspecific distress" ("K10 and K6 Scales," n.d.). For this study, the continuous measure of the summed score is used.

Covariates include:

- race/ethnicity: Black or African American, Latinx, White, and Other;
- sex (male or female);
- age (ranging from 18-28);
- log of total household income;
- education and employment status: in school (regardless of work status), working but not in school, and neither working nor in school;
- residence (during fall and winter): lives with parents, renter, lives in dorm, owns home, and other;
- marital status: single; divorced, separated, or widowed; cohabitating; and married;
- whether the individual has a child (yes/no);
- whether the individual is the head of household (yes/no); and
- whether the individual is considered low-income (less than $20,000 household income) (yes/no).

Statistical Analysis

This is a study of a national sample of young adults investigating the extent to which positive mental health is associated with major role transitions. The unit of analysis is the person-year. The study presents tabulations for all study variables in total and by age (in 2-year increments).

Least squares linear regressions were conducted, adjusting for all covariates, to understand the relationship between role transitions and each of the outcomes of positive mental health, its subscales and distress separately. Then fixed effects models at the individual level were used to analyze whether these variations were evident within an individual over time, or whether they only existed between individuals. Fixed effects models eliminate any variation between groups (in this case, between individuals), detecting only changes within groups (in this case, within the same individual across time). This is intended to control for any unobserved individual confounders that do not vary over time.

Weighted effect coding (WEC) was used for categorical variables instead of dummy variables. Thus, there are no category-specific reference groups. Instead, each category is compared to the weighted mean (Nieuwenhuis et al., 2017; te Grotenhuis et al., 2016). This is a suggested way to avoid the over-used and rarely scrutinized practice of comparing all racial/ethnic groups to white individuals using a reference group (Mayhew & Simonoff, 2015; Ro & Bergom, 2020). Race/ethnicity and sex are omitted from fixed effects models as they do not change within the time period for anyone in the sample. All outcome variables were transformed into z-scores with a mean of 0 and a standard deviation of 1, so that coefficients are interpreted as effect sizes.

Though the PSID Transition to Adulthood sample includes survey weights, they were omitted from main models in this study. In preliminary analyses, models were run with and without survey weights, and no substantive differences in coefficients for main predictors were found. In instances in which coefficients do not substantively differ between weighted and unweighted models, the statistical guidance suggests against weighting for adjusted linear regressions

(Dumouchel & Duncan, 1983; Winship & Radbill, 1994). Huber-White Sandwich estimators are used at the family level to account for clustering of siblings in the sample. All analyses were conducted using STATA 14.2.

RESULTS

Table 1 describes study variables for the total sample and by age categories. Continuous variables are presented in mean and standard deviation. Number of person-years and percentages are used for categorical variables. There are minimal differences across age groups for positive mental health and its subscales and a slight downward trend across age in mental distress. Household income decreases with age as more individuals leave their family homes and become the heads of their own households. Black individuals make up 41.5 percent of the sample due to an oversampling of low-income individuals in the original 1968 sample. As expected, proportions of individuals who have completed traditional role transitions increases with age. Yet even in the group of 26-28 year olds, almost 30 percent live with parents. The percentage of individuals unemployed and not in school increases with age from 17 .1 for 18- to 19-year-olds to 27.9 percent for 26- to 28-year-olds. Though a majority of individuals are single, the percent decreases from 90.3 to 52.3 across age groups. Only 20 percent of observations with at least one child are married (results not shown here). These findings are consistent with patterns in recent Gallup polls and the National Academies of Medicine Report on young adults (Bonnie et al., 2014; Clifton, 2016).

Table 2-1: Description of PSID Transition to Adulthood Sample Characteristics – Total and by Age Group (unweighted)

	Total	18-19 years old	20-21 years old	22-23 years old	24-25 years old	26-28 years old
Positive Mental Health – Mean (SD)	49.00 (11.6)	49.11 (11.6)	48.99 (11.7)	48.98 (11.5)	48.81 (11.5)	48.94 (12.0)
Emotional Wellbeing	12.10 (2.6)	12.09 (2.7)	12.12 (2.6)	12.12 (2.5)	11.96 (2.8)	12.03 (2.8)
Social Wellbeing	12.71 (5.9)	12.75 (6.1)	12.75 (6.0)	12.71 (5.9)	12.48 (5.7)	12.69 (6.1)
Psychological Wellbeing	24.19 (5.1)	24.27 (5.0)	24.12 (5.2)	24.16 (5.1)	24.38 (5.1)	24.22 (5.3)
Distress	5.18 (3.8)	5.37 (3.7)	5.25 (3.7)	4.99 (3.8)	5.13 (4.1)	5.12 (4.6)

Household Income	$74,470 ($111,352)	$81,982 ($98,886)	$82,331 ($134,959)	$68,753 ($106,589)	$49,003 ($45,890)	$48,806 ($33,590)
Age – N (%)		1,378 (24.5)	1,914 (33.9)	1,736 (30.8)	521 (9.3)	86 (1.5)
Race/Ethnicity						
Black	2,340 (41.5)	561 (40.7)	770 (40.2)	735 (42.3)	237 (45.5)	39 (2.8)
Hispanic	597 (10.6)	151 (10.9)	203 (10.6)	179 (10.3)	51 (9.8)	41 (2.1)
White	2,565 (45.5)	627 (45.5)	900 (47.0)	781 (44.9)	223 (42.8)	41 (2.4)
Other	133 (2.4)	39 (2.8)	41 (2.1)	10 (1.9)	13 (15.1)	10 (1.9)
Sex						
Male	2,694 (47.8)	659 (47.8)	893 (46.7)	839 (48.3)	258 (49.5)	45 (52.3)
Female	2,941 (52.2)	719 (52.2)	1,021 (53.3)	897 (51.7)	263 (50.5)	41 (47.7)
Employment Status						
Employed	2,306 (40.9)	316 (22.9)	679 (35.5)	959 (55.2)	299 (57.4)	53 (61.6)
Student	2,337 (41.5)	826 (59.9)	933 (48.8)	475 (27.4)	94 (18.0)	9 (10.5)
Unemployed	992 (17.6)	236 (17.1)	302 (15.8)	302 (17.4)	128 (24.6)	24 (27.9)
Residence						
With parents	2,609 (46.3)	892 (64.7)	850 (44.4)	688 (39.6)	155 (29.8)	24 (27.9)
Rent	1805 (32.0)	123 (8.9)	609 (31.8)	764 (44.0)	264 (50.7)	45 (52.3)
Dorm	633 (11.2)	269 (19.5)	282 (14.7)	79 (4.6)	2 (0.4)	1 (1.2)
Own	317 (5.6)	37 (2.7)	83 (4.3)	116 (6.7)	68 (13.1)	13 (15.1)
Other	271 (4.8)	57 (4.1)	90 (4.7)	89 (5.1)	32 (6.1)	3 (3.5)
Marital Status						
Single	4,341 (77.0)	1,244 (90.3)	1,549 (80.9)	1,207 (69.5)	296 (56.8)	45 (52.3)
Divorced	80 (1.4)	2 (0.2)	21 (1.1)	31 (1.8)	18 (3.5)	8 (9.3)
Cohabitating	815 (14.5)	102 (7.4)	251 (13.1)	322 (18.6)	123 (23.6)	17 (19.8)
Married	399 (7.1)	30 (2.2)	93 (4.9)	176 (10.1)	84 (16.1)	16 (18.6)
Have at least one child						
No	4,432 (78.7)	1,242 (90.1)	1,560 (81.5)	1,265 (72.9)	318 (61.0)	47 (54.7)
Yes	1,203 (21.4)	136 (9.9)	354 (18.5)	471 (27.1)	203 (38.9)	39 (45.4)
Head of household						
No	3849 (68.3)	1,261 (91.5)	1,452 (75.9)	953 (54.9)	159 (30.5)	24 (27.9)
Yes	1,786 (31.7)	117 (8.5)	462 (24.1)	783 (45.1)	362 (69.5)	62 (72.1)
Low Income						
Yes	1,125 (19.9)	1,179 (85.6)	1,526 (79.7)	1,358 (78.2)	380 (72.9)	67 (77.9)
No	4,510 (80.0)	199 (14.4)	388 (20.3)	378 (21.8)	141 (27.1)	19 (22.1)

N=5,798 person-years, 2,030 individuals

Table 2-2 presents the adjusted least squares linear models and Table 2-3 presents the fixed effects regressions for positive mental health, its subscales, and distress with weighted effect coding (WEC) and effect sizes. Across most models, being a student is associated with higher levels of positive mental health and its subscales and lower distress compared to the weighted mean. Effect sizes range from 0.040 ($p=0.035$) in the fixed effects model for emotional wellbeing to 0.163 ($p<0.001$) for the least squares model of social wellbeing. Similarly, across all models, being disconnected (not in school or work) is associated with lower levels of positive mental health and its subscales and higher distress compared to the weighted mean. Effect sizes range from -0.077

(p=0.031) in the fixed effects model for social wellbeing to -0.217 (p<0.001) in the least squares model for positive mental health. Being employed is associate with lower social wellbeing than the weighed mean for both models (effect sizes of -0.078 [p<0.001] and -0.034 [p=0.031] respectively).

For place of residence, there are very few significant results, none of which remain in the fixed effects models. Living with parents is associated with an effect size of -0.042 (p=0.013) for social wellbeing in the least squares model. Living in a dorm is associated with higher positive mental health and social wellbeing than the weighted average, but only for the least squares models (effect sizes of 0.101 [p=0.012] and 0.151 [p<0.001] respectively). Owning a home is associated with higher psychological wellbeing in the least squares model (effect size 0.137 [p=0.019]).

For marital status, a few results remain robust in the fixed effects models. Being single is associated with lower levels of emotional wellbeing in both least squares and fixed effects models (effect sizes -0.036 [p<0.001] and -0.028 [p=0.012] respectively). Being single is also associated with slightly higher social wellbeing, slightly lower psychological wellbeing, and slightly higher levels of distress in the least squares models. Divorced individuals have lower positive mental health than the weighted average in the fixed effects model (effect size -0.241 [p=0.033]). Both cohabitating and married individuals have higher average levels of emotional wellbeing (effect sizes 0.074 [p=0.033] and 0.219 [p<0.001] respectively) but only the effect size for cohabitating remains significant and is actually larger in magnitude in the fixed effects model (0.110 [p=0.003]). Cohabitating is also associated with lower levels of social wellbeing in the least squares model and higher psychological wellbeing in the fixed effects model compared to the weighted mean. Both having a child and being the head of household are not significantly associated with any outcome except for negative associations with social wellbeing in the least squares models.

Table 2-2: Least Squares Regression Models for Positive Mental Health, its Subscales, and Mental Distress on Role Transitions for PSID Transition to Adulthood Sample, unweighted

	1	2	3	4	5

VARIABLES	Positive Mental Health	Emotional Wellbeing	Social Wellbeing	Psychological Wellbeing	Mental Distress
	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)
Age	**0.017***	-0.006	**0.040*****	-0.005	**-0.023****
	(0.030)	(0.456)	**(<0.001)**	(0.514)	**(0.004)**
Log of Total Income	0.013	0.017	0.017	0.000	-0.001
	(0.364)	(0.250)	(0.243)	(0.985)	(0.969)
Employment Status					
Student	**0.129*****	**0.084*****	**0.163*****	**0.058****	**-0.066****
	(<0.001)	**(<0.001)**	**(<0.001)**	**(0.003)**	**(0.001)**
Employed	-0.034	0.004	**-0.078*****	0.011	-0.021
	(0.057)	(0.820)	**(<0.001)**	(0.534)	(0.257)
Unemployed	**-0.217*****	**-0.205*****	**-0.191*****	**-0.162*****	**0.205*****
	(<0.001)	**(<0.001)**	**(<0.001)**	**(<0.001)**	**(<0.001)**
Residence					
Parents' home	-0.032	-0.011	**-0.042***	-0.016	-0.003
	(0.080)	(0.535)	**(0.013)**	(0.370)	(0.874)
Rent	0.006	-0.000	0.017	-0.006	-0.013
	(0.785)	(0.984)	(0.432)	(0.802)	(0.565)
Dorm	**0.101***	0.066	**0.151*****	0.018	0.045
	(0.012)	(0.071)	**(<0.001)**	(0.663)	(0.230)
Own	0.103	0.086	0.043	**0.137***	-0.081
	(0.075)	(0.103)	(0.466)	**(0.019)**	(0.185)
Other	-0.099	**-0.154***	-0.109	-0.017	0.118
	(0.176)	**(0.043)**	(0.112)	(0.816)	(0.157)
Marital Status					
Single	-0.009	**-0.036*****	**0.018***	**-0.022***	**0.022***
	(0.350)	**(<0.001)**	**(0.045)**	**(0.018)**	**(0.024)**
Divorced	0.028	0.056	-0.110	0.163	-0.126
	(0.833)	(0.705)	(0.394)	(0.205)	(0.418)
Cohabitating	0.001	**0.074***	**-0.084***	0.062	0.024
	(0.967)	**(0.033)**	**(0.014)**	(0.078)	(0.521)
Married	0.081	**0.219*****	-0.004	0.075	**-0.250*****
	(0.145)	**(<0.001)**	(0.936)	(0.185)	**(<0.001)**
Have a child					
Yes	-0.025	0.019	**-0.095****	0.046	0.035
	(0.485)	(0.589)	**(0.006)**	(0.188)	(0.340)
No	0.007	-0.005	**0.027****	-0.013	-0.010
	(0.485)	(0.589)	**(0.006)**	(0.188)	(0.340)
Head of Household					
Yes	-0.040	0.012	**-0.082****	-0.000	0.051
	(0.190)	(0.707)	**(0.005)**	(0.989)	(0.128)
No	0.020	-0.006	**0.041****	0.000	-0.025
	(0.190)	(0.707)	**(0.005)**	(0.989)	(0.128)
Low Income					
Yes	-0.067	-0.046	-0.037	**-0.084***	**0.130****
	(0.078)	(0.262)	(0.317)	**(0.036)**	**(0.002)**
No	0.017	0.012	0.009	0.021*	**-0.033****
	(0.078)	(0.262)	(0.317)	(0.036)	**(0.002)**
Race/Ethnicity					
Black	**0.096*****	0.041	0.012	**0.182*****	**-0.048***
	(<0.001)	(0.075)	(0.616)	**(<0.001)**	**(0.038)**
White	**-0.043***	-0.003	0.015	**-0.112*****	0.037
	(0.050)	(0.880)	(0.489)	**(<0.001)**	(0.090)
Latinx	**-0.136***	-0.078	-0.075	**-0.180*****	0.010
	(0.016)	(0.133)	(0.165)	**(0.001)**	(0.851)

Other	-0.281	-0.327*	-0.159	-0.280	0.098
	(0.052)	(0.024)	(0.134)	(0.077)	(0.400)
Sex					
Female	**0.034***	**0.060*****	0.002	**0.044****	0.033
	(0.048)	**(<0.001)**	(0.926)	**(0.008)**	(0.053)
Male	**-0.038***	**-0.067*****	-0.002	**-0.050****	-0.037
	(0.048)	**(<0.001)**	(0.926)	**(0.008)**	(0.053)
Constant	**-0.502***	-0.061	**-1.036*****	0.105	0.489*
	(0.025)	(0.783)	**(<0.001)**	(0.633)	(0.038)

Robust p-values in parentheses
*** p<0.001, ** p<0.01, * p<0.05
N=5,798 person-years, 2,030 individuals
All coefficients expressed as effect sizes
Huber White Sandwich Errors used to account for family-level clustering

Table 2-3: Individual-Level Fixed Effects Models for Positive Mental Health, its Subscales, and Mental Distress on Role Transitions for PSID Transition to Adulthood Sample, unweighted

	1	2	3	4	5
VARIABLES	**Positive Mental Health**	**Emotional Wellbeing**	**Social Wellbeing**	**Psychological Wellbeing**	**Mental Distress**
	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)
Age	0.011	-0.002	**0.019***	0.003	**-0.018****
	(0.167)	(0.781)	**(0.019)**	(0.727)	**(0.009)**
Log of Total Income	-0.008	-0.002	0.000	-0.017	0.011
	(0.602)	(0.874)	(0.986)	(0.341)	(0.343)
Employment Status					
Student	**0.064*****	**0.040***	**0.069*****	**0.044***	-0.030
	(<0.001)	**(0.035)**	**(<0.001)**	**(0.022)**	(0.093)
Employed	-0.021	-0.002	**-0.034***	-0.006	-0.003
	(0.181)	(0.922)	**(0.037)**	(0.700)	(0.838)
Unemployed	**-0.098****	**-0.088***	**-0.077***	**-0.087***	**0.077***
	(0.005)	**(0.026)**	**(0.031)**	**(0.013)**	**(0.027)**
Residence					
Parents' home	0.002	-0.003	0.011	-0.006	0.004
	(0.894)	(0.849)	(0.504)	(0.704)	(0.795)
Rent	-0.014	-0.014	-0.011	-0.011	-0.012
	(0.471)	(0.489)	(0.577)	(0.596)	(0.548)
Dorm	0.005	0.058	-0.020	0.006	0.042
	(0.879)	(0.089)	(0.587)	(0.887)	(0.195)
Own	0.073	0.072	0.040	0.081	-0.030
	(0.149)	(0.209)	(0.482)	(0.101)	(0.546)
Other	-0.027	-0.094	-0.029	0.021	-0.016
	(0.696)	(0.168)	(0.691)	(0.761)	(0.776)
Marital Status					
Single	-0.006	**-0.028***	0.010	-0.011	0.019
	(0.505)	**(0.012)**	(0.255)	(0.247)	(0.053)
Divorced	**-0.241***	-0.238	-0.203	-0.186	0.001
	(0.033)	(0.169)	(0.059)	(0.159)	(0.996)
Cohabitating	0.046	**0.110****	-0.025	**0.075***	-0.053
	(0.183)	**(0.003)**	(0.467)	**(0.036)**	(0.127)
Married	0.021	0.120	-0.016	0.005	-0.093
	(0.681)	(0.065)	(0.754)	(0.931)	(0.121)
Have a child					
Yes	0.010	0.043	-0.049	0.057	-0.000
	(0.808)	(0.332)	(0.272)	(0.171)	(0.992)

No	-0.003	-0.012	0.014	-0.016	0.000
	(0.808)	(0.332)	(0.272)	(0.171)	(0.992)
Head of Household					
Yes	-0.001	-0.002	0.014	-0.018	0.008
	(0.964)	(0.954)	(0.628)	(0.555)	(0.786)
No	0.001	0.001	-0.007	0.009	-0.004
	(0.964)	(0.954)	(0.628)	(0.555)	(0.786)
Low Income					
Yes	-0.025	0.030	-0.035	-0.030	0.001
	(0.506)	(0.476)	(0.344)	(0.450)	(0.973)
No	0.006	-0.008	0.009	0.008	-0.000
	(0.506)	(0.476)	(0.344)	(0.450)	(0.973)
Constant	-0.141	0.073	-0.411	0.123	0.261
	(0.513)	(0.747)	(0.065)	(0.590)	(0.171)

Robust p-values in parentheses
*** p<0.001, ** p<0.01, * p<0.05
N=5,798 person-years, 2,030 individuals
All coefficients expressed as effect sizes
Huber White Sandwich Errors used to account for family-level clustering

DISCUSSION

This study investigates the extent to which young adult role transitions such as moving out of the family home, entering higher education, starting a career, forming romantic partnerships and becoming a parent, are associated with positive mental health and distress. This study reveals new insights about the positive mental health of young adults both in and out of college and is one of the first to investigate the connection between wellbeing and role transitions in a longitudinal sample. The most consistent set of findings across positive mental health, emotional, social, and psychological wellbeing, and distress are as follows: when individuals are in college, they tend to have higher levels of positive outcomes and lower levels of distress than when they are not in school, especially compared to those who are neither in work nor school. The effect sizes for students and for unemployed are quite small in the fixed effects models. General guidance on effect sizes is that anything under 0.2 is considered a small effect and none of the employment status effect sizes are above 0.1 in the fixed effects models (J. Cohen, 2013).

Since the fixed effects models control for any time invariant differences between individuals, they offer less-biased estimates. Discrepancies between the least squares and fixed effects models in

which the least squares models are significant and the fixed effects models are not may suggest that static or even inherent differences in individuals are driving the results. For instance, in the least squares models, living in a dorm is associated with higher levels of positive mental health and social wellbeing than the weighted average, but the effect sizes decrease and the p-values are no longer anywhere close to significant in the fixed effects models. Thus, for individuals who lived in a dorm and then changed to a different living situation in a different wave of the survey, there is no significant or detectable association between positive mental health or social wellbeing and living in a dorm. This suggests that there may be systematic differences between individuals who select into dorm living and those who do not.

Apart from the employment status findings, the only significant least squares results robust to the fixed effects specification are that single individuals have a very small negative association with emotional wellbeing and in contrast, cohabitating individuals have a small positive association with emotional and psychological wellbeing. Though not significant in the least squares model, getting divorced is slightly negatively associated with positive mental health in the fixed effects model.

For many of the role transitions of interest in this study, including leaving the parent's home and buying a home, having children, and becoming the head of the household, the results do not show evidence that changes over time at the individual level are associated with positive mental health or mental distress. Perhaps this null finding is due to a balance of both positive and negative experiences that result from these life changes, or perhaps this is an indication of the changing priorities of the individuals in this study. These findings build upon past studies, which previously suggested a relationship in cross-sectional samples between role transitions and emotional wellbeing. This study finds a cross-sectional relationship between several role transitions and positive mental

health, but this relationship is no longer significant once time invariant individual characteristics are accounted for in a longitudinal model.

Millennials and younger generations are redefining the transition into adulthood. Millennials are more likely to live with their parents for longer, less likely to buy a house, and are delaying marriage and childbearing compared to past generations (Bonnie et al., 2014; Clifton, 2016). Living with parents into adulthood is not significantly associated with any of the mental health outcomes presented here. Since more and more young adults continue to live with their parents, it is somewhat encouraging that there do not seem to be many negative associations with wellbeing (for the children, at least). It is yet to be determined whether these findings represent a systematic difference in individuals who choose different life paths and choose to go through life transitions at different times, or whether there are actual protective characteristics of certain choices. This study suggests that some life transitions, like being a student and cohabitating with a partner, may be more related to positive mental health than others, like moving out of the family home, having a child, or becoming the head of household.

Given the relative lack of significant findings, more research is needed to understand what drives positive mental health for young adults. Recent surveys reveal potential priorities and values that define the Millennial generation (Clifton, 2016) and perhaps their associations with positive mental health can be tested.

Limitations

Causality

This is an associational study and does not fully approach causality. Though this study exploits the longitudinal design of the sample with individual-level fixed effects to extract any time-invariant confounding between individuals, it still cannot directly test whether role transitions affect

positive mental health due to issues of temporality and the lack of a control group. The models cannot identify whether, for instance, individuals who experience increases in positive mental health are subsequently more likely to cohabitate with a partner, or whether cohabitating with a partner directly leads to increases in positive mental health. Additionally, this study cannot offer insight into those individuals who completely opt out of completing role transitions within the observed time period. However, given the available data, fixed effects models do a great deal to decrease the bias of the estimates.

Representativeness

While the original PSID study was a representative sample of the US, this study sample is not an entirely accurate representation of the young adult population due to the sampling method from the original Child Development Supplement. Thus, even with sample weights, it would not fully approach generalizability.

Data limitations of important covariates

One important individual characteristic missing from this dataset is sexual orientation (though it will be available in subsequent waves of the PSID Transition to Adulthood sample). Members of the LGBTQ+ community have been (and in many places, continue to be) excluded from the opportunity to complete the role transitions discussed in this study due to discriminatory laws and legislation. In future studies, sexual orientation would be an important covariate or moderator to include. Additionally, the majority of observations in the study sample skew to the younger side of young adulthood. Only 1.5 percent of the sample is between 26 and 28 years old. Since Millennials tend to delay many of these role transitions, it would be advantageous to have a larger sample of older individuals. There is a trade-off between a systematic sample (in this case,

having exactly three observations per individual) and a sample that includes many individuals of all ages.

CONCLUSION

This study is the first, to my knowledge, to comprehensively investigate the positive mental health of a nationally representative group of young adult Millennials. This study provides new insights into the potential connection between major role transitions from adolescence into adulthood and positive mental health. Specifically, being a student is associated with better mental health outcomes than being unemployed. Cohabitating with a partner is associated with heightened levels of emotional and psychological wellbeing. Yet other role transitions, such as leaving the family home, becoming a parent, or becoming the head of household do not show evidence of a relationship with positive mental health outcomes. This suggests that it may be important to refine the definition of the transition to adulthood as younger generations continue to reinvent their values and choices as young adults.

APPENDICES

Table 2-A: Dimensions of the Mental Health Continuum – Short Form

Flourishing Component	MHC-SF indicator
	During the past month, how often did you feel…
Emotional wellbeing	
Positive affect	happy
Positive affect	interested in life
Life satisfaction	satisfied
Social wellbeing	
Social contribution	that you had something important to contribute to society
Social integration	that you belonged to a community
Social actualization	that our society is becoming a better place for people like you
Social acceptance	that people are basically good
Social coherence	that the way our society works makes sense
Psychological wellbeing	
Self-acceptance	that you liked most parts of your personality
Environmental mastery	good at managing the responsibilities of your daily life
Positive relations with others	that you had warm and trusting relationships with others
Personal growth	that you had experiences that challenged you to grow and become a better person
Autonomy	confident to think or express your own ideas and opinions
Purpose in life	that your life has a sense of direction or meaning to it

(Adapted from Hone et al., 2014, p. 66)

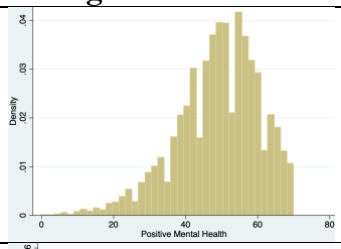
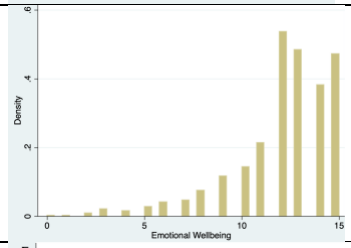
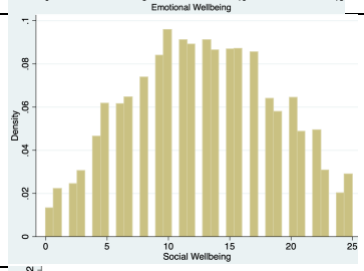
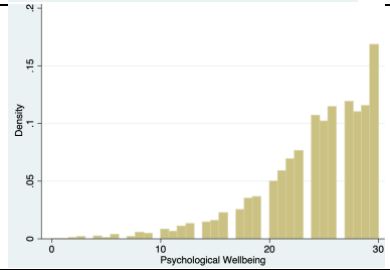
Table 2-B: Tabulations of Age by Year for Individuals in the PSID Transition to Adulthood Sample, Years 2005-2017 (Unweighted)

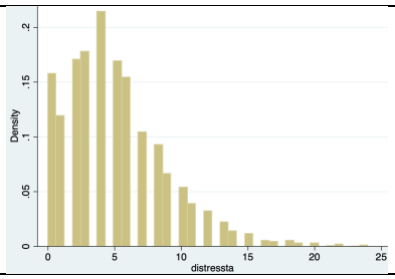
	YEAR							
AGE	**2005**	**2007**	**2009**	**2011**	**2013**	**2015**	**2017**	**Total**
18	208	0	182	203	167	113	160	1,033
19	181	47	197	200	174	179	157	1,135
20	207	190	208	199	201	171	164	1,340
21	36	172	184	175	168	165	144	1,044
22	0	174	216	186	177	210	171	1,134
23	0	43	196	194	173	151	159	916
24	0	0	200	202	165	176	180	923
25	0	0	41	183	171	158	174	727
26	0	0	0	193	197	166	148	704
27	0	0	0	38	53	78	170	339
28	0	0	0	0	0	0	73	73
Total	632	626	1,424	1,773	1,646	1,567	1,700	9,368

Table 2-C: PSID Transition to Adulthood Sample Size and Response rates

Year	Sample size	Response rate
2017	2,526	87%
2015	1,641	87%
2013	1,804	90%
2011	1,907	92%
2009	1,559	92%
2007	1,118	90%
2005	745	89%

Table 2-D: Description of Positive Mental Health, its Subscales, and Distress Distributions for the Full PSID Transition to Adulthood Sample (unweighted)

	Mean	SD	Min	Max	Histogram
Positive Mental Health	49.11	11.54	0	70	
Emotional Wellbeing	12.13	2.63	0	15	
Social Wellbeing	12.80	5.12	0	25	
Psychological Wellbeing	24.19	5.12	0	30	

Distress	5.03	3.81	0	24	

A Dual Factor Model to Conceptualize Positive Mental Health and Mental Illness

Since positive mental health and mental illness operate as two constructs rather than two ends of the same spectrum, the field of positive psychology has adopted a dual-factor model of mental illness and positive mental health to explain complete mental health more comprehensively. Table 2-E presents a matrix of the dual factor model, with two categories of mental illness (low/high) and three categories of positive mental health (languishing, moderate mental health, and flourishing) (Keyes, 2007). For diagnostic purposes, in order to be considered flourishing, an individual must score high ('almost every day' or 'every day') on at least one of the emotional wellbeing measures and at least six of the functional wellbeing measures (Keyes, 2007). The threshold for languishing is at one low score ('never' or 'once or twice') in emotional wellbeing at least six low scores on social and/or psychological wellbeing. Those in the middle are considered to have moderate wellbeing. Keyes suggests a categorical and continuous assessment of flourishing/languishing and a dual factor model of flourishing/languishing and mental illness (Keyes, 2007). Note that positive mental health is not used as a categorical variable in the analyses of these studies since the continuous variable conserves more of the information within the construct and is more useful in regression analyses.

Table 2-E: Dual Factor Matrix of Positive Mental Health and Mental Illness

	Positive Mental Health		
Mental Illness	**Languishing**	**Moderately Mentally Healthy**	**Flourishing**

Low	Languishing	Moderately mentally healthy	Flourishing: complete mental health
High	Mental Illness and Languishing	Moderately mentally healthy and mental illness	Flourishing and mental illness

The dual factor framework, as opposed to a single spectrum of mental illness to mental health, is supported by substantial evidence. First, positive mental health and mental illness are only moderately correlated (-.53 according to Keyes, 2005; see Table 2-F for correlations from the study sample) and there are individuals in all six categories of the positive mental health /mental illness matrix (Hatch et al., 2010; Keyes, 2002, 2005; Lamers et al., 2011). In the MIDUS study, of the 23 percent of adults who had a mental illness, 60 percent had moderate levels of mental health and 8 percent were flourishing (Keyes, 2005). In a study of adolescents, 57 percent were in the flourishing/low mental illness category, 13 percent were in both the languishing/low mental illness and flourishing/high mental illness groups and 17 percent were in the languishing/high mental illness group. A confirmatory factor analysis reinforced the notion that positive mental health and mental illness are two separate, unipolar factors (Keyes, 2005).

Table 2-F: Correlations between Positive Mental Health, its Subscales, and Mental Distress in the Full PSID Transition to Adulthood Sample, Years 2005-2017 pooled (unweighted)

	Positive MH	**Emo WB**	**Social WB**	**Psych WB**	**Distress**
Positive MH	1				
Emo WB	0.77	1			
Social WB	0.86	0.51	1		
PsychWB	0.86	0.63	0.52	1	
Distress	-0.46	-0.50	-0.33	-0.40	1

Table 2-G: Tabulations of Positive Mental Health Categorical Diagnosis in Total and by Age Group for Full PSID Transition to Adulthood Sample (Unweighted)

Positive Mental Health Categorical Diagnosis	Total	18-19 years old	20-21 years old	22-23 years old	24-25 years old	26-28 years old
Languishing – N (%)	289 (3.08)	73 (3.37)	72 (3.02)	61 (2.98)	59 (3.58)	24 (2.15)
Moderate Mental Health – N (%)	2966 (31.66)	709 (32.70)	766 (32.13)	646 (31.51)	504 (30.55)	341 (30.56)

Flourishing – N (%)	6113 (65.25)	1386 (63.93)	1546 (64.85)	1343 (65.51)	1087 (65.88)	751 (67.29)

Potential Predictors of Positive Mental Health

Predictors of positive mental health remain mostly unclear. For instance, although several studies have investigated it, the relationship between age and wellbeing remains unclear. Whereas depression has been found to decrease with age in adulthood up until the early 60s and increase again, life satisfaction, a component of subjective wellbeing, was not found to be related to age (Diener & Suh, 1997; Dittmann-Kohli et al., 2001; Mroczek & Kolarz, 1998; Schotanus-Dijkstra et al., 2016). Following a sample of 83 adults over 25 years, Fischer et al found that subjective wellbeing was not associated with age (2014). A study of Dutch adults found that with age, emotional wellbeing increased, psychological wellbeing decreased, and social wellbeing did not change significantly (Westerhof & Keyes, 2010). There are many potential reasons why the findings of these studies do not align. The article by Westerhof and Keyes (2010) is the only one listed which incorporates all three types of positive mental health: emotional, psychological and social wellbeing. The others focused only on emotional wellbeing. Additionally, without both a longitudinal, multiple-cohort design, it is difficult to parse out which differences are based on historical trends vs. age-related trends.

The relationship between income and positive mental health also remains unclear. The same study of Dutch adults found no significant relationship between positive mental health and household income (Westerhof & Keyes, 2010). For adolescents, a systematic review suggests that income, along with other demographics (race, age, and gender) only contribute modestly to variation in life satisfaction (Proctor et al., 2009). In a study of Dutch adolescents, low subjective wellbeing was found to have a slightly graded relationship with family income, but high subjective wellbeing does not seem to be related at all to family income (Nielsen et al., 2016). A study of three small

cohorts of adults over 25 years found that income and financial status did predict subjective wellbeing (Fischer et al., 2014). One study found that those flourishing were more likely to be in paid employment than other groups (Schotanus-Dijkstra et al., 2016). Those in the lowest income quintile during early childhood predicted 1.65 points lower in flourishing than those in the highest quintile when they reached adolescence (Gariepy et al., 2017). However, there were no other significant findings in early childhood or for pre-school, middle childhood, or pre-adolescence. Using sibling clusters, those with higher initial levels of psychological wellbeing tended to have higher income in adulthood (Neve & Oswald, 2012).

Personality traits are highly predictive of positive mental health. Specifically, those with high levels of conscientiousness and extraversion and low levels of neuroticism are much more likely to be flourishing (Hasler, 2017; Lamers, Westerhof, et al., 2012; Schotanus-Dijkstra et al., 2016; Soons & Liefbroer, 2009; Steel et al., 2008). Studies consistently find that these personality traits are more predictive of positive mental health than demographic characteristics (Jewell & Kambhampati, 2015; Schotanus-Dijkstra et al., 2016). However, personality traits may also be endogenous to positive mental health and may not be a mutable factor for interventions. Thus, personality traits are not a main focus of any analyses in this dissertation.

Social support is also predictive of flourishing. For adolescents, higher levels of parent, peer and teacher support predicted higher psychological wellbeing over a 4-year period from 8th to 11th grade (Ciarrochi et al., 2017). Higher social support predicted emotional wellbeing in Israeli adolescents (Ronen et al., 2016). In adulthood, living with someone predicted higher levels of emotional wellbeing (Schotanus-Dijkstra et al., 2016).

Chapter 3:
Racial/Ethnic Differences in Positive Mental Health for Millennials during the Transition to Adulthood

ABSTRACT

Positive mental health is an important predictor of better health and life outcomes. Previous studies consistently find that Black adults have higher levels of positive mental health and lower levels of mental illness than other racial/ethnic groups. This Population Study of Income Dynamics (PSID) Transition to Adulthood sample (N=5,798 person-years) includes three waves of data for each individual (waves occur every two years from 2005-2017). Using adjusted least squares linear regressions, with interactions for cohort (the year an individual turned 18) and race/ethnicity, as well as fully stratified analyses, this study investigates the extent to which Black young adults have higher positive mental health than their peers in other racial/ethnic groups, and whether this trend is changing over time. Results show that in earlier cohorts (those who turned 18 around 2002), Black individuals had substantially higher positive mental health than other racial/ethnic groups, but with later cohorts, the levels of positive mental health converge among Black, Latinx, and white groups. Additionally, stratified analyses show that there is a negative association between income and positive mental health for Blacks but a positive association for whites. More research is needed to understand the potential drivers of these trends.

INTRODUCTION

Positive mental health is an important protective factor for many life outcomes (Gilmour, 2015; Keyes et al., 2012; Keyes & Grzywacz, 2005; Keyes & Simoes, 2012; Lamers et al., 2015; Schotanus-Dijkstra et al., 2017; Suldo & Shaffer, 2008) and previous studies show that Black adults have higher levels of positive mental health on average than other racial/ethnic groups (Keyes, 2009a; Ryff et al., 2003), even in the face of discrimination, structural oppression, and the lower levels of income and physical health that result (Assari, 2017; Bailey et al., 2017; Boyd et al., 2020; Erving et al., 2019). Given the important developmental period of the transition from adolescence to adulthood, it is important to investigate whether the racial/ethnic patterns of positive mental health are also evident for young adults and whether this relationship is changing over time. The high levels of positive mental health in the Black community may be indicators of community and individual resilience. Where positive outcomes emerge, it is important to learn how to preserve, protect, and promote them. Additionally, if these positive outcomes are declining, it will be important to understand what environmental, social, and political forces may be targeting certain communities.

Overall, little is known about the state of positive mental health of today's young adults. Few studies have examined young adult positive mental health at all, and of those that do, most focus on college students. This study investigates whether Black young adults have high levels of positive mental health compared to other racial/ethnic groups, and whether this trend is changing over time. The study also investigates differential relationships of income and positive mental health by race/ethnicity.

BACKGROUND

Racial/Ethnic Differences in Positive Mental Health

Investigating differences in physical and mental health by characteristics like race/ethnicity is important given the structural inequities that plague our country. Black people have, on average, lower levels of income, lower life expectancy, and higher levels of physical health issues than whites as a result of a long legacy of racism in the US, enduring structural inequities, and the stress that accompanies these realities (Bailey et al., 2017; Boyd et al., 2020; Geronimus et al., 2006; Link & Phelan, 1995; Phelan & Link, 2015; Williams & Mohammed, 2013). Yet studies on racial/ethnic differences consistently find that Black adults have better mental health outcomes than white adults (Assari et al., 2015; Erving et al., 2019; Keyes, 2009a; Mouzon, 2017). This has been found for psychiatric disorders (Barnes, 2015; Breslau et al., 2006; Erving et al., 2019; Erving & Thomas, 2018; Gibbs et al., 2012; Himle et al., 2009; Jackson et al., 2010; Kessler, Berglund, Demler, et al., 2005; Levine et al., 2013; Mouzon, 2013, 2017; Williams et al., 2007), mental distress (Bratter & Eschbach, 2005), psychological wellbeing (Ryff et al., 2003), and overall positive mental health (Keyes, 2009a).

Though researchers often refer to this pattern as the "Black-white paradox" in mental health, this description suggests some problematic assumptions about differences between Black and white people: that any finding in which Black individuals have more advantageous outcomes should be considered surprising or out of the realm of expectation. This may reinforce the harmful deficit narrative surrounding the Black community in social science research (Baldridge, 2014, 2017). Instead, where such consistent, positive outcomes are found in the face of adversity, it is important to document these trends, better understand them, and learn from them.

The population of interest in this study includes Millennials as they come into young adulthood. In general, young adulthood is a critical time of development, when individuals may be leaving their family homes for the first time, embarking on new experiences in careers or higher education, finding romantic partners, and establishing themselves as individuals (Bonnie et al., 2014). Scholars argue that this is a period that sets the tone and trajectory for the remainder of adulthood,

as early childhood sets the trajectory for childhood and adolescence (Bonnie et al., 2014). The Millennial generation has been of particular interest for scholars due to the massive social, political and economic shifts that have accompanied the development of this generation (S. E. Allen et al., 2020). Yet few studies have looked at racial/ethnic differences in social patterns of Millennials (R. Allen, 2019). Scholars argue for the importance of this investigation because racial/ethnic groups have vastly different experiences with broad societal shifts and historical events (S. E. Allen et al., 2020). The period of time in which Millennials have come of age has brought both new positive changes as well as devastating, public tragedies and injustices for the Black community (S. E. Allen et al., 2020; Kendi, 2016). As Black Millennials grow into adulthood during these tumultuous times, it is important to investigate their positive mental health levels.

Current Study and Contribution to the Literature

To my knowledge, this is the first study to investigate racial/ethnic differences in positive mental health in a young adult population. The few previous studies of overall positive mental health do not look at trajectories over time, so this study makes an additional novel contribution by investigating time trajectories of racial/ethnic differences in positive mental health. If high levels of positive mental health are found for Black young adults, it is also important to understand if those coming of age in later years have the same protective factors as their older peers. This study uses a large, nationally representative sample of young adults, including an oversampling of Black individuals so that the samples of Blacks and whites are equivalent.

METHODS

Positive Mental Health

Positive mental health encompasses three constructs: emotional, social, and psychological wellbeing (Keyes & Simoes, 2012). The Mental Health Continuum – Short Form (MHC-SF) is a

widely used measure of positive mental health and has high levels of construct validity (Hone et al., 2014; Howell et al., 2013; Keyes, 2002, 2005, 2006, 2007; Lamers et al., 2011; Provencher & Keyes, 2011; Robitschek & Keyes, 2009; Westerhof & Keyes, 2010). The Mental Health Continuum – Short Form is "a syndrome of symptoms of positive feelings and positive functioning in life" similar to mental illness scales that capture a collection of symptoms of negative mental health (Keyes, 2002, p. 208).

Data

The Population Study of Income Dynamics (PSID) is the longest running longitudinal dataset of households in the world, beginning in 1968 and continuing today. It is nationally representative with roughly 18,000 people making up around 5,000 families in the original sample and includes a wide range of economic, social and health information. Low-income families were oversampled in 1968. A new sample of immigrant families was added in the 1990s so the sample would continue to be nationally representative (Waterman, 1993).

This study utilizes the Transition to Adulthood Supplement, which is sampled from the Child Development Supplement. The Child Development Supplement began in 1997, when up to two children ages 0-12 (and their caregivers) per family were randomly selected from the original sample of 2705 PSID families, and 88 percent were successfully surveyed (N=3,563 children) (Mainieri, 2006). There were Child Development Supplement follow-up waves in 2002 and 2007 for any original Child Development Supplement individuals who were still of eligible age (up to 17 years old).

The Transition to Adulthood Supplement began in 2005 when the oldest children from the Child Development Supplement reached adulthood, who had either completed or left high school and whose family was still in the PSID. The years included in the Transition to Adulthood

Supplement are 2005, 2007, 2009, 2011, 2013, 2015 and 2017, with rolling inclusion from the Child Development Supplement as new groups of individuals turned 18. In 2017, all young adults in the PSID sample, not just those who were part of the Child Development Supplement, were eligible for the Transition to Adulthood Supplement. Individuals remain in the Transition to Adulthood Supplement until they transition into the main PSID survey at 28 years old. Thus, this is not a dataset which intends to follow the same individuals across all waves of data collection – instead, it is intended to capture as many waves as possible for individuals as they age into young adulthood and before they are included in the main PSID dataset as full adults. Appendix 2-B shows tabulations of age by year for observations in the full Transition to Adulthood sample to show the rolling inclusion of individuals as they age into the sample at age 18 and out of the sample at age 28. State-level indicators and neighborhood-level geocodes are available. See Appendix 2-C for the sample size and response rates for each wave of the Transition to Adulthood Supplement.

Sample

The sample includes individuals from 18 to 28 years old who have at least three observations for the Mental Health Continuum-Short Form over the seven waves between 2005 and 2017. This excludes a small portion of observations (less than four percent) of 17-year-olds and 1048 individuals who only have one or two observations. It also excludes any observations over the 3 of interest for individuals with more than three waves. The total sample of person-years is 5798.

Measures

Mental Health Continuum-Short Form

For the three subscales of positive mental health, the Mental Health Continuum – Short Form includes frequency in the last month of 1) happiness, 2) interest in life, and 3) feeling satisfied

for the subscale of emotional wellbeing, feeling 1) that I have something to contribute to society, 2) a sense of belonging to a community, 3) that society is getting better for people like me, 4) that people are basically good, and 5) that the way society works makes sense for the subscale of social wellbeing and feeling 1) good at managing daily responsibilities, 2) that I have trusting and warm relationships with others, 3) challenged to grow and learn, 4) confident in my own ideas, 5) that I liked my own personality, and 6) that my life has direction for the subscale of psychological wellbeing. Possible responses include: 1) never, 2) once or twice, 3) about once a week, 4) 2 to 3 times a week, 5) almost every day, and 6) every day. By summing the values of each item, the scale ranges from 0 to 70.

Cohort

To measure the trajectory of positive mental health over time, the cohort variable is used, which indicates the year that an individual turned 18. Since this sample includes three waves of data for each individual, an individual who turned 18 in 2005 would have observations at age 18 in 2005, 20 in 2007, and 22 in 2009. There are some individuals in the sample who turned 18 before the first wave; for instance, for individuals who turned 18 in 2002, the sample includes observations for these individuals at age 21 in 2005, 23 in 2007, and 25 in 2009.

Race/ethnicity

Individuals self-reported their race. Original racial categories include American Indian or Alaskan Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, White, and Other. In a separate item, individuals self-reported Hispanic ethnicity. Racial/ethnic categories were then collapsed into the following four categories: Non-Hispanic Black or African American, Hispanic/Latinx, Non-Hispanic White, and Non-Hispanic Other. Due to the original

sampling structure of the PSID, there are only 133 individuals in the Other category, so meaningful interpretations of the individual racial categories within the Other category are not possible.

Covariates include:

- sex (male or female);
- age (ranging from 18-28);
- log of total household income;
- education and employment status: in school (regardless of work status), working but not in school, and neither working nor in school;
- residence (during fall and winter): lives with parents, renter, lives in dorm, owns home, and other;
- marital status: single, divorced, separated, or widowed, cohabitating, and married;
- whether the individual has a child (yes/no);
- whether the individual is the head of household (yes/no);
- high school graduation: no high school diploma, has a GED, or has a high school diploma; and
- whether the individual is considered low-income (less than $20,000 household income) (yes/no).

Covariates were chosen based on hypothesized relationship to positive mental health and how this relationship may change over time for Millennials (Bonnie et al., 2014; Clifton, 2016).

Statistical Analysis

This is a study of a national sample of young adults investigating the extent to which positive mental health varies by race/ethnicity and whether these differences change over time based on

cohort (the year an individual turned 18). The unit of analysis is the person-year. The study presents tabulations or means and standard deviations for all study variables in total, and by race/ethnicity.

Least squares linear regressions were conducted, adjusting for all covariates, with an interaction term for race/ethnicity and cohort, and then in stratified analyses by race/ethnicity. Marginal plots were conducted using the 'marginsplot' command to graphically show the interactions between cohort and race/ethnicity in a fully interacted model (equivalent to the stratified analyses). The main outcome variables were standardized to have a mean of 0 and a standard deviation of 1 so all coefficients can be interpreted as effect sizes.

This study uses Huber-White sandwich estimators to account for family-level clustering. STATA 14.2 was used to conduct all analyses. Survey weights are available for the PSID and models were run with and without survey weights, finding no substantive differences in coefficients for main predictors between models. One of the main characteristics adjusted for using the weights is race/ethnicity due to the oversampling of low-income individuals in the original 1968 sample. If there were substantive differences, the stratified analyses would account for the racial/ethnic adjustments (Dumouchel & Duncan, 1983). Thus, survey weights were omitted from the main analyses in this study due to statistical preferences against weighting for adjusted linear regressions (Dumouchel & Duncan, 1983; Winship & Radbill, 1994).

RESULTS

Table 3-1 describes study variables for the total sample, and by race/ethnicity. Means and standard deviations are presented for continuous variables. Number of person-years and percentages are presented for categorical variables. Black individuals make up 41 percent of the sample. Black individuals have the highest levels of positive mental health (though not statistically different than whites at the $p<0.05$ level), slightly lower emotional and social wellbeing than whites ($p=0.011$ and

p<0.001 respectively), and higher levels of psychological wellbeing than whites (p<0.001). Average household income for whites is more than twice that of Black households, and also substantially higher than that of Latinx households.

Table 3-1: Description of the PSID Transition to Adulthood Sample– Total, By Race/ethnicity

	Total	Black or African American	Non-Hispanic White	Latinx/Hispanic
Sample Size – Person-years (Individuals)	5635 (2161)	2311 (888)	2435 (926)	756 (296)
Positive Mental Health – Mean (SD)	49.00 (11.59)	49.55 (11.80)	49.02 (11.04)	47.63 (12.26)
Emotional Wellbeing	12.10 (2.64)	12.09 (2.78)	12.21 (2.41)	11.92 (2.79)
Social Wellbeing	12.71 (5.98)	12.44 (6.26)	13.06 (5.70)	12.41 (5.99)
Psychological Wellbeing	24.19 (5.14)	25.02 (5.04)	23.76 (4.92)	23.30 (5.56)
Household Income	$74,470 ($111,352)	$45,509 ($41,751)	$105,045 ($155,603)	$61,616 ($51,068)
Age - N (%)	21.02 (1.98)	21.11 (2.00)	20.95 (1.94)	21.04 (2.02)
Sex				
Male	2694 (47.81)	1222 (48.55)	1142 (46.90)	354 (46.83)
Female	2941 (52.19)	1189 (51.45)	1293 (53.10)	402 (53.17)
Employment Status				
Employed	2306 (40.92)	988 (42.75)	981 (40.29)	299 (39.55)
Student	2337 (41.47)	759 (32.84)	1181 (48.50)	317 (41.93)
Unemployed	992 (17.60)	564 (24.41)	273 (11.21)	140 (18.52)
Residence				
With parents	2609 (46.30)	1207 (52.23)	919 (37.74)	424 (56.08)
Rent	1805 (32.03)	673 (29.12)	894 (36.71)	197 (26.06)
Dorm	633 (11.23)	221 (9.56)	331 (13.59)	57 (7.54)
Own	317 (5.63)	81 (3.50)	191 (7.84)	39 (5.16))
Other	271 (4.81)	129 (5.58)	100 (4.11)	39 (5.16)
Marital Status				
Single	4341 (77.04)	1862 (80.57)	1785 (73.31)	581 (76.85)
Divorced	80 (1.42)	28 (1.21)	40 (1.64)	12 (1.59)
Cohabitating	815 (14.46)	337 (14.58)	346 (14.21)	114 (15.08)
Married	399 (7.08)	84 (3.63)	264 (10.84)	49 (6.48)
High School Graduation				
None	449 (7.97)	281 (12.16)	94 (3.86)	67 (8.86)
GED	230 (4.08)	120 (5.19)	85 (3.49)	20 (2.65)
Graduate	4956 (87.95)	1910 (82.65)	2256 (92.65)	669 (88.49)
Have at least one child				
No	4432 (78.65)	1582 (68.46)	2120 (87.06)	610 (80.69)
Yes	1203 (21.35)	729 (31.54)	315 (12.94)	146 (19.31)
Head of household				
No	3849 (68.31)	1550 (67.07)	1627 (66.82)	567 (75.00)
Yes	1786 (31.69)	761 (32.93)	808 (33.18)	189 (25.00)
Low Income				
No	4510 (80.04)	705 (30.50)	284 (11.66)	124 (16.40)
Yes	1125 (19.96)	1606 (69.50)	2151 (88.34)	632 (83.60)

Table 3-2 shows adjusted least squares regressions with interactions for cohort and race/ethnicity for positive mental health, emotional, social, and psychological wellbeing. Black individuals are the reference group. For the earliest cohort, represented by main coefficient for race/ethnicity (those who turned 18 in 2002), white young adults have lower levels of positive mental health (effect size=-0.317 [p=0.002]), social wellbeing (effect size=-0.231 [p=0.023]), and psychological wellbeing (effect size=-0.387 [p<0.001]) compared to Blacks. However, the interaction between cohort (year turned 18) and race/ethnicity is significant and positive for whites for social wellbeing (effect size=0.031 [p=0.010]) signifying an upward slope across cohorts for white individuals compared to Blacks. Similarly, for the earliest cohort, Latinx young adults have lower levels of positive mental health (effect size=-0.679 [p=0.001]), emotional (effect size=-0.507 [p=0.009]), social (effect size=-0.547 [p<0.002]), and psychological wellbeing (effect size=-0.633 [p=0.001]) compared to Blacks. However, the interaction between cohort (year turned 18) and race/ethnicity is significant and positive for Latinx individuals for positive mental health (effect size=0.056 [p=0.012]), emotional (effect size=0.049 [p=0.023]), and social wellbeing (effect size=0.058 [p=0.004]) signifying an upward slope across cohorts for Latinx individuals compared to Blacks.

Table 3-2: Least Squares Linear Regression Models of Positive Mental Health and Subscales, with interaction for Race/Ethnicity and Cohort (unweighted)

VARIABLES	1 Positive Mental Health	2 Emotional Wellbeing	3 Social Wellbeing	4 Psychological Wellbeing
	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)
Race/Ethnicity (Reference Group=Black)				
White	**-0.317** **(0.002)**	-0.112 (0.251)	**-0.231*** **(0.023)**	**-0.387***** **(<0.001)**
Latinx	**-0.679***** **(0.001)**	**-0.507**** **(0.009)**	**-0.547**** **(0.002)**	**-0.633**** **(0.001)**
Other	-0.331 (0.517)	-0.088 (0.865)	-0.109 (0.747)	-0.574 (0.318)
Interaction: Race/Ethnicity and Cohort				
White	0.024	0.009	**0.031***	0.012

	(0.054)	(0.423)	**(0.010)**	(0.286)
Latinx	**0.056***	**0.049***	**0.058****	0.034
	(0.012)	**(0.023)**	**(0.004)**	(0.123)
Other	-0.005	-0.034	-0.006	0.014
	(0.933)	(0.568)	(0.867)	(0.826)
Cohort	-0.007	0.000	-0.010	-0.005
	(0.414)	(0.991)	(0.297)	(0.506)
Sex (Reference Group = Male)				
Female	0.064	**0.122*****	-0.003	**0.087***
	(0.077)	**(0.001)**	(0.922)	**(0.015)**
Age	0.019*	-0.003	**0.042*****	-0.005
	(0.018)	(0.661)	**(<0.001)**	(0.489)
Log of Total Income	0.010	0.016	0.015	-0.003
	(0.478)	(0.279)	(0.319)	(0.863)
Education/Employment Status (Reference Group = Employed)				
Student	**0.133*****	0.063	**0.212*****	0.022
	(<0.001)	(0.057)	**(<0.001)**	(0.521)
Unemployed	**-0.153*****	**-0.190*****	**-0.090***	**-0.142****
	(0.001)	**(<0.001)**	**(0.041)**	**(0.002)**
Residence (Reference Group = Parents' home)				
Rent	0.039	0.012	0.061	0.010
	(0.304)	(0.749)	(0.088)	(0.795)
Dorm	**0.130****	0.076	**0.192*****	0.032
	(0.006)	(0.086)	**(<0.001)**	(0.506)
Own	**0.149***	0.105	0.102	**0.163***
	(0.021)	(0.076)	(0.123)	**(0.013)**
Other	-0.050	-0.129	-0.052	0.014
	(0.523)	(0.109)	(0.483)	(0.857)
Marital Status (Reference Group = Single)				
Divorced	0.038	0.091	-0.121	0.180
	(0.781)	(0.554)	(0.353)	(0.178)
Cohabitating	0.027	**0.122****	**-0.084***	**0.098***
	(0.515)	**(0.004)**	**(0.042)**	**(0.023)**
Married	0.092	**0.258*****	-0.016	0.094
	(0.139)	**(<0.001)**	(0.794)	(0.137)
Have a Child	-0.011	0.037	**-0.106***	0.081
	(0.821)	(0.426)	**(0.019)**	(0.080)
Head of Household	-0.072	0.010	**-0.135****	-0.011
	(0.113)	(0.824)	**(0.002)**	(0.810)
High School Graduation Status (Reference Group = No HS Degree)				
GED	-0.033	-0.004	-0.090	0.033
	(0.777)	(0.969)	(0.433)	(0.754)
High School Degree	**0.192***	0.117	0.147	**0.202***
	(0.023)	(0.163)	(0.067)	**(0.013)**
Low Income	-0.070	-0.047	-0.035	-0.093
	(0.143)	(0.356)	(0.458)	(0.065)
Constant	**-0.585***	-0.271	**-1.116*****	0.119
	(0.016)	(0.268)	**(<0.001)**	(0.625)

Robust p-values in parentheses
*** p<0.001, ** p<0.01, * p<0.05
N=5,798 person-years, 2,030 individuals
All coefficients represented as effect sizes
Huber White Sandwich Errors used to account for family-level clustering

Tables 3-3 to 3-7 present stratified least squares regression estimates by race ethnicity (Black, Latinx, and white; 'Other' category omitted due to extremely small sample size) for positive mental health and each of its subscales respectively. Figures 3-1a through 3-1d illustrate the trajectories of positive mental health and its subscales by race/ethnicity across cohorts based on the stratified analyses. Figure 3-1a shows that while earlier cohorts of Black individuals had the highest levels of positive mental health, the slope is slightly decreasing while the level for White individuals is slightly increasing, and the confidence intervals converge at the 2009 cohort ($p<0.05$). The Latinx group starts with the lowest levels of positive mental health but is statistically similar to both other racial/ethnic groups by the 2009 cohort ($p<0.05$). While there is a substantial difference in positive mental health average levels for Black versus Latinx individuals in the earliest cohort (an effect size of around 0.6), all three groups are within a 0.1 effect size of each other by the final cohort (2013). In Figure 3-1b, Black and white individuals have steady and similar levels of emotional wellbeing across cohorts, and the Latinx group increases over time (an increase in effect size of around 0.6). Figure 3-1c shows that Blacks had the highest levels of social wellbeing in the earliest cohort, but the slope across cohorts for Blacks decreases while the slope for whites and Latinx individuals increases. Blacks have the lowest average levels of social wellbeing by the 2009 cohort. Figure 3-1d shows that Blacks have consistently higher levels of psychological wellbeing than whites across cohort. The psychological wellbeing level for the Latinx group increases slightly over time, but the increase is not significant at the $p<0.05$ level.

Table 3-3: Stratified Least Squares Linear Regression Models of Positive Mental Health (unweighted)

VARIABLES	1 Black	2 White	3 Latinx
	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)
Cohort	-0.006	0.015	**0.052***
	(0.497)	(0.073)	**(0.014)**
Sex (Ref Group = Male)			
Female	-0.002	**0.102***	0.162

	(0.979)	**(0.044)**	(0.162)
Age	0.026*	0.017	0.011
	(0.037)	(0.137)	(0.634)
Log of Total Income	**-0.043****	**0.100*****	0.112
	(0.005)	(<0.001)	(0.073)
Employment Status (Ref Group = Employed)			
Student	0.087	0.172***	0.071
	(0.118)	(<0.001)	(0.512)
Unemployed	-0.106	**-0.187***	**-0.320***
	(0.100)	**(0.012)**	**(0.035)**
Residence (Ref Group = Parents' home)			
Rent	0.026	0.056	0.004
	(0.673)	(0.287)	(0.973)
Dorm	0.133	0.122	0.112
	(0.073)	(0.058)	(0.598)
Own	0.118	0.116	0.254
	(0.264)	(0.210)	(0.230)
Other	-0.153	0.073	-0.035
	(0.170)	(0.482)	(0.903)
Marital Status (Ref Group = Single)			
Divorced	0.243	-0.162	0.569
	(0.227)	(0.435)	(0.082)
Cohabitating	0.047	-0.022	0.003
	(0.448)	(0.731)	(0.982)
Married	0.077	0.093	-0.002
	(0.526)	(0.238)	(0.993)
Have a Child	-0.090	0.074	0.067
	(0.156)	(0.339)	(0.655)
Head of Household	-0.011	-0.044	-0.059
	(0.867)	(0.514)	(0.700)
High School Graduation (Ref Group = No HS Degree)			
GED	0.172	-0.150	-0.515
	(0.267)	(0.398)	(0.114)
High School Degree	**0.238***	0.256	-0.087
	(0.036)	(0.071)	(0.681)
Low Income	**-0.170****	0.035	0.246
	(0.007)	(0.668)	(0.171)
Constant	-0.181	**-1.973*****	**-2.012***
	(0.582)	**(<0.001)**	**(0.020)**

Robust p-values in parentheses
*** p<0.001, ** p<0.01, * p<0.05
All coefficients represented as effect sizes
Huber White Sandwich Errors used to account for family-level clustering

Table 3-4: Stratified Least Squares Linear Regression Models of Emotional Wellbeing (unweighted)

	1	**2**	**3**
VARIABLES	**Black**	**White**	**Latinx**
	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)
Cohort	0.001	0.008	**0.055****
	(0.905)	(0.290)	**(0.006)**
Sex (Ref Group = Male)			
Female	0.096	**0.117***	0.219
	(0.100)	**(0.016)**	(0.055)
Age	-0.001	-0.000	0.002
	(0.919)	(0.977)	(0.925)

Log of Total Income	-0.019	**0.074****	0.077
	(0.333)	**(0.001)**	(0.264)
Employment Status (Ref Group = Employed)			
Student	0.070	0.086	-0.060
	(0.180)	(0.065)	(0.576)
Unemployed	**-0.198****	-0.111	**-0.315***
	(0.004)	(0.202)	**(0.036)**
Residence (Ref Group = Parents' home)			
Rent	-0.004	0.008	0.090
	(0.945)	(0.875)	(0.443)
Dorm	0.044	0.064	0.154
	(0.545)	(0.273)	(0.400)
Own	0.086	0.044	0.298
	(0.395)	(0.588)	(0.130)
Other	**-0.223***	-0.037	-0.131
	(0.047)	(0.740)	(0.672)
Marital Status (Ref Group = Single)			
Divorced	0.169	0.024	0.491
	(0.512)	(0.913)	(0.060)
Cohabitating	0.101	**0.151***	0.086
	(0.110)	**(0.014)**	(0.580)
Married	0.211	**0.290*****	0.243
	(0.077)	**(<0.001)**	(0.324)
Have a Child	0.006	0.045	-0.004
	(0.924)	(0.573)	(0.980)
Head of Household	0.073	0.021	-0.098
	(0.324)	(0.732)	(0.520)
High School Graduation (Ref Group = No HS Degree)			
GED	0.169	-0.056	**-0.773***
	(0.244)	(0.790)	**(0.013)**
High School Degree	0.167	0.173	-0.213
	(0.135)	(0.278)	(0.305)
Low Income	-0.075	-0.082	0.235
	(0.284)	(0.307)	(0.202)
Constant	0.008	**-1.144****	-1.299
	(0.981)	**(0.002)**	(0.123)

Robust p-values in parentheses
*** p<0.001, ** p<0.01, * p<0.05
All coefficients represented as effect sizes
Huber White Sandwich Errors used to account for family-level clustering

Table 3-5: Stratified Least Squares Linear Regression Models of Social Wellbeing (unweighted)

	1	2	3
VARIABLES	**Black**	**White**	**Latinx**
	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)
Cohort	-0.008	**0.020***	**0.047****
	(0.373)	**(0.011)**	**(0.009)**
Sex (Ref Group = Male)			
Female	-0.093	0.063	0.094
	(0.108)	(0.194)	(0.366)
Age	**0.045*****	**0.046*****	0.020
	(0.001)	**(<0.001)**	(0.395)
Log of Total Income	-0.033	**0.097*****	0.054
	(0.062)	**(<0.001)**	(0.333)

Employment Status (Ref Group = Employed)			
Student	**0.127***	**0.266*****	**0.208***
	(0.036)	**(<0.001)**	**(0.035)**
Unemployed	-0.004	**-0.195****	-0.286
	(0.944)	**(0.004)**	(0.054)
Residence (Ref Group = Parents' home)			
Rent	0.098	0.052	-0.077
	(0.093)	(0.311)	(0.457)
Dorm	**0.225****	**0.174****	0.095
	(0.003)	**(0.005)**	(0.623)
Own	0.176	0.033	0.199
	(0.157)	(0.710)	(0.373)
Other	-0.148	0.048	0.062
	(0.174)	(0.647)	(0.776)
Marital Status (Ref Group = Single)			
Divorced	0.173	**-0.403****	0.298
	(0.407)	**(0.010)**	(0.552)
Cohabitating	-0.049	**-0.163****	-0.029
	(0.447)	**(0.008)**	(0.816)
Married	0.046	-0.063	-0.041
	(0.712)	(0.428)	(0.843)
Have a Child	**-0.178****	0.015	-0.108
	(0.005)	(0.832)	(0.427)
Head of Household	-0.106	-0.084	-0.055
	(0.099)	(0.204)	(0.687)
High School Graduation (Ref Group = No HS Degree)			
GED	0.062	-0.049	-0.564
	(0.704)	(0.733)	(0.057)
High School Degree	0.133	**0.368****	-0.139
	(0.209)	**(0.003)**	(0.526)
Low Income	-0.122	0.080	0.125
	(0.054)	(0.318)	(0.455)
Constant	-0.627	**-2.601*****	-1.381
	(0.078)	**(<0.001)**	(0.102)

Robust p-values in parentheses
*** p<0.001, ** p<0.01, * p<0.05
All coefficients represented as effect sizes
Huber White Sandwich Errors used to account for family-level clustering

Table 3-6: Stratified Least Squares Linear Regression Models of Psychological Wellbeing (unweighted)

	1	**2**	**3**
VARIABLES	**Black**	**White**	**Latinx**
	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)
Cohort	-0.005	0.006	0.034
	(0.565)	(0.473)	(0.124)
Sex (Ref Group = Male)			
Female	0.055	0.097	0.144
	(0.316)	(0.057)	(0.224)
Age	0.007	-0.015	0.001
	(0.568)	(0.198)	(0.960)
Log of Total Income	**-0.049*****	**0.076***	**0.149***
	(0.001)	**(0.027)**	**(0.049)**
Employment Status (Ref Group = Employed)			

Student	0.012	0.033	-0.051
	(0.812)	(0.485)	(0.641)
Unemployed	**-0.132***	-0.138	-0.228
	(0.040)	(0.082)	(0.105)
Residence (Ref Group = Parents' home)			
Rent	-0.054	0.061	0.052
	(0.369)	(0.242)	(0.646)
Dorm	0.015	0.041	0.064
	(0.835)	(0.527)	(0.762)
Own	0.016	**0.201***	0.188
	(0.856)	**(0.038)**	(0.353)
Other	-0.057	0.128	-0.084
	(0.579)	(0.258)	(0.783)
Marital Status (Ref Group = Single)			
Divorced	0.259	0.091	**0.684*** **
	(0.114)	(0.688)	**(<0.001)**
Cohabitating	0.110	0.062	-0.003
	(0.063)	(0.347)	(0.985)
Married	0.013	0.135	-0.082
	(0.917)	(0.096)	(0.722)
Have a Child	-0.000	0.127	0.278
	(0.998)	(0.109)	(0.058)
Head of Household	0.060	-0.013	-0.019
	(0.366)	(0.858)	(0.911)
High School Graduation (Ref Group = No HS Degree)			
GED	0.229	-0.252	-0.107
	(0.089)	(0.181)	(0.764)
High School Degree	**0.297****	0.061	0.075
	(0.007)	(0.684)	(0.711)
Low Income	**-0.202****	0.028	0.287
	(0.002)	(0.743)	(0.126)
Constant	0.318	-0.833	**-2.262***
	(0.312)	(0.071)	**(0.015)**

Robust p-values in parentheses
*** p<0.001, ** p<0.01, * p<0.05
Coefficients represented as effect sizes
Huber White Sandwich Errors used to account for family-level clustering

Figures 3-1a to 3-1d: Cohort Trajectories for Positive Mental Health and its Subscales by Race/Ethnicity for PSID Transition to Adulthood Sample (unweighted)

Figure 3-1a: Cohort Trajectories for Positive Mental Health by Race/Ethnicity

Figure 3-1b: Cohort Trajectories for Emotional Wellbeing by Race/Ethnicity

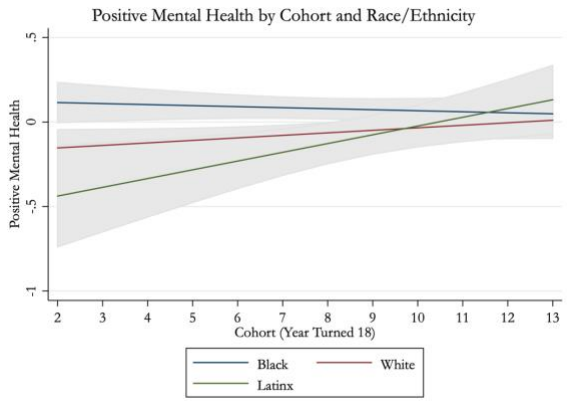


Figure 3-1a: Cohort Trajectories for Social Wellbeing by Race/Ethnicity

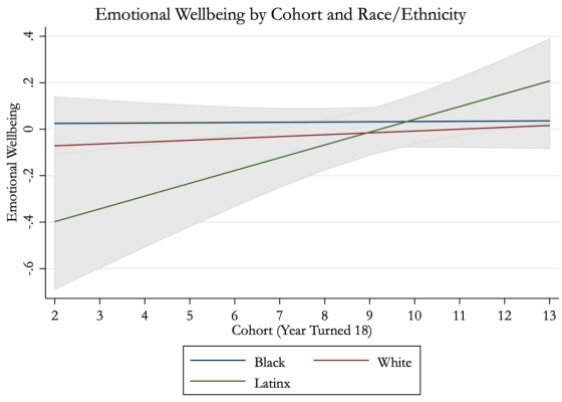
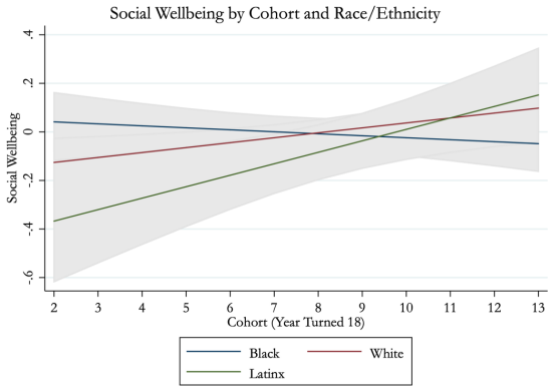
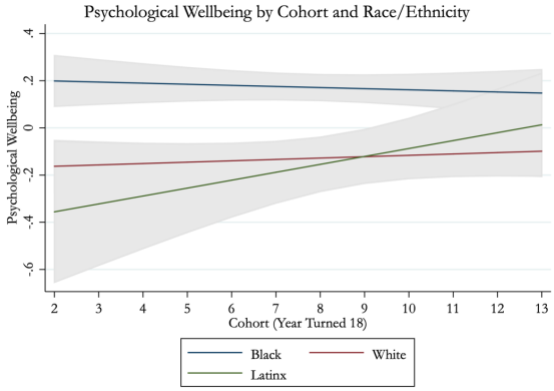


Figure 3-1a: Cohort Trajectories for Psychological Wellbeing by Race/Ethnicity





NOTE: Figures generated from post-regression marginsplot commands of fully interacted models by race/ethnicity. Includes 95% Confidence Interval. 'Other' race/ethnicity category omitted from figures. Outcome variables represented with effect sizes.

Another important trend found in Tables 3-3 through 3-7 and illuminated in Figures 3-2a through 3-2d is the differential trends in positive mental health and its subscales by household income. For Blacks, there is a negative association between income and both positive mental health and psychological wellbeing (effect size=-0.043 [p=0.005] and effect size=-0.049 [p=0.001] respectively). However, for whites, there is a positive association between income and all positive mental health outcomes (positive mental health=0.100 [p<0.001], emotional wellbeing=0.074 [p=0.001], social wellbeing=0.097 [p<0.001], psychological wellbeing=0.076 [p=0.027]). For the Latinx group, the effect sizes are positive for all outcomes but only statistically significant for psychological wellbeing (effect size 0.149 [p=0.049]).

Figures 3-2a to 3-2d: Income Trajectories for Positive Mental Health and its Subscales by Race/Ethnicity for PSID Transition to Adulthood Sample (unweighted)

Figure 3-2a: Income Trajectories for Positive Mental Health by Race/Ethnicity

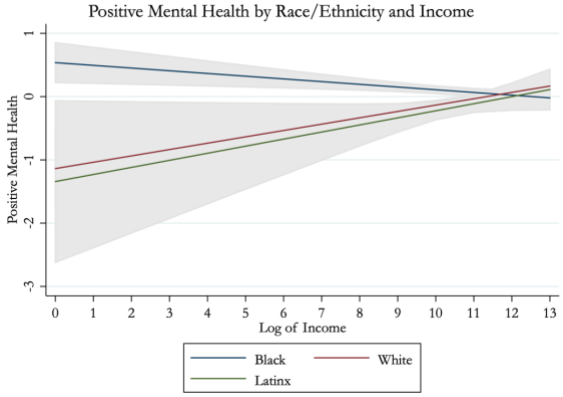


Figure 3-2b: Income Trajectories for Emotional Wellbeing by Race/Ethnicity

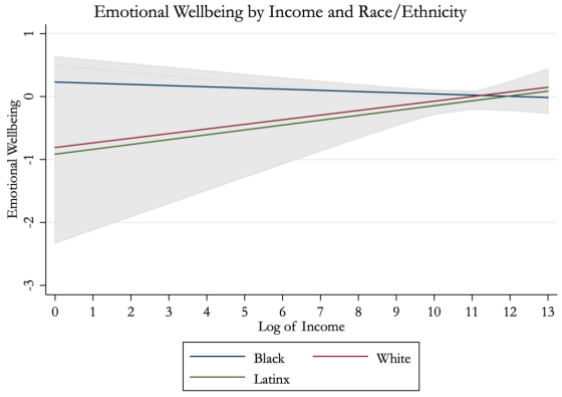


Figure 3-2a: Income Trajectories for Social Wellbeing by Race/Ethnicity

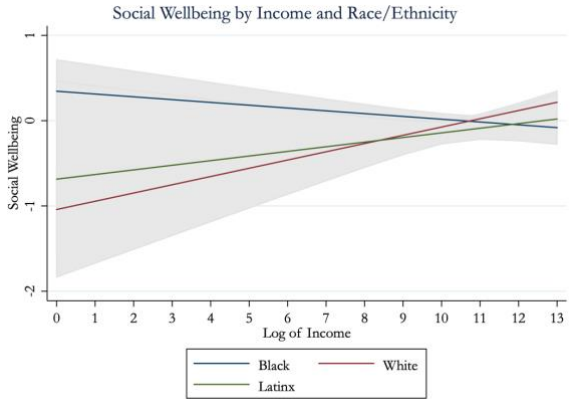
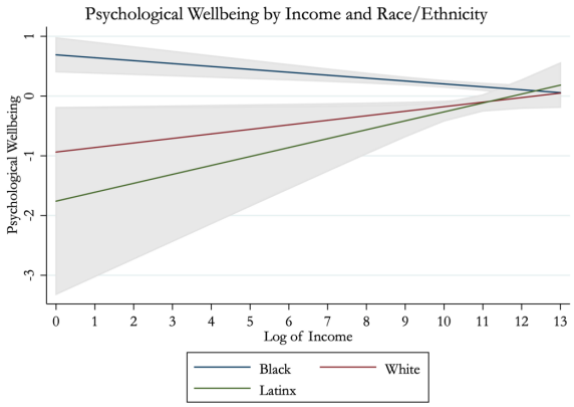


Figure 3-2a: Income Trajectories for Psychological Wellbeing by Race/Ethnicity



NOTE: Figures generated from post-regression marginsplot commands of fully interacted models by race/ethnicity. Includes 95% Confidence Interval. 'Other' race/ethnicity category omitted from figures. Outcome variables represented with effect sizes.

DISCUSSION

This study is the first, to my knowledge, to investigate racial/ethnic differences in the trajectories over time in positive mental health of young adults. The study finds that Black individuals in earlier cohorts (those who turned 18 in 2002) have higher levels of overall positive mental health, and the subscales of social wellbeing and psychological wellbeing compared to white and Latinx individuals, but these differences disappear for positive mental health and social

wellbeing with younger cohorts. Black and white young adults have similar levels of emotional wellbeing across time, and Black individuals continue to have the highest levels of psychological wellbeing across cohorts. An additional important finding is that for Black individuals, there is actually a negative relationship between household income and positive mental health. While this may seem counter-intuitive, previous studies have found similar patterns for Black adults in terms of levels of depression (Assari & Caldwell, 2018), self-rated mental health (Assari, Lapeyrouse, et al., 2018), and emotional wellbeing (Assari, Preiser, et al., 2018).

The results of this study make important contributions to the literature on racial/ethnic differences in mental health. Whereas a time-invariant model would have suggested that Blacks have slightly higher levels of positive mental health than whites and Latinx individuals, this cohort-specific model shows that while the levels for Black individuals are slightly decreasing over time, the levels for whites and Latinx individuals are increasing and have surpassed that of Blacks by the end of the study period (those who turned 18 in 2013). The myriad previous studies documenting high levels of mental health in the Black adult population may mean that there is a wealth of yet-to-be-explained protective factors in the Black community (Barnes, 2015; Bratter & Eschbach, 2005; Breslau et al., 2006; Erving et al., 2019; Erving & Thomas, 2018; Gibbs et al., 2012; Himle et al., 2009; Jackson et al., 2010; Kessler, Berglund, Demler, et al., 2005; Keyes, 2009a; Levine et al., 2013; Mouzon, 2013, 2017; Ryff et al., 2003; Williams et al., 2007). This study suggests that whites and Latinx individuals are catching up to Blacks in regard to their positive mental health. It remains unclear what factors are driving this change, and whether it represents increased challenges for the Black community.

Future Directions

It is important to better understand the protective factors that have allowed the Black adult population to persistently have better mental health than other racial/ethnic groups in the face of systemic racism and extreme adversity. By understanding, documenting and monitoring these protective factors, we can better understand where and when societal factors may be impinging on these protective factors as well as learning from these factors for the benefit of all. Based on the slightly decreased trajectory for Black individuals in conjunction with the increased trajectory for white and Latinx individuals in positive mental health, it is possible that societal, economic and political factors are impacting the positive mental health of Black Millennials in novel ways, further advantaging the white population.

Few studies have investigated the key determinants for the high levels of mental health for Black adults and those studies that do exist have not found reliable evidence. In cross-sectional, associational studies, researchers did not find evidence that family relationships, friendships or religious importance or participation were related to differences in mental health in Black people compared to whites (Mouzon, 2013, 2014, 2017). One study found a relationship between strong identification with and positive feelings about being Black with fewer symptoms of depressive and alternatively, that higher levels of internalized racism was related to higher levels of depression (Hughes et al., 2015).

Another important future direction is to better understand what may be driving the negative association between positive mental health and income for Black individuals. While this trend has been documented in other studies, its causes remain unclear. Potential predictors to test include everyday discrimination and location-based segregation or isolation.

Finally, one more important future direction is to better understand the trajectory of positive mental health for the Latinx young adult population. This study did not have a large enough sample size of Latinx individuals to investigate this trend at a more granular level. Future studies could

investigate whether country of origin, language spoken at home, or whether and which generation emigrated to the US.

Limitations

Causality

This is an associational study and cannot suggest causality. It is possible that there are systematic, unobserved differences between groups that explain the associations seen here between racial/ethnic groups and levels of positive mental health and its subscales across time.

Representativeness

While the original 1968 PSID sample was representative of the US population, this study sample is not an entirely accurate representation of the young adult population due to the sampling method from the original Child Development Supplement. Thus, even with sample weights, it would not fully approach generalizability.

Race/ethnicity

The racial/ethnic breakdown in this study is a crude and incomplete illustration of the racial/ethnic diversity of individuals. This is both due to the available data and due to the choices of the author. While there are somewhat more specific subgroups available, these subgroups included too few individuals to present meaningful findings. Specifically, the Other category includes Asian, Pacific Islander, American Indian, and Native Hawaiian. Only 2.4 percent of individuals are in the 'Other' category, which makes it difficult to break this out into more specific racial/ethnic groups. While it would be beneficial to include more nuance within the broad 'Latinx' category, there are too few individuals to break out differences by country of origin or generation within the US.

CONCLUSION

Previous studies have shown a consistent trend of high levels of mental health in the Black community. This study finds that while Black individuals who turned 18 around 2002 had higher levels of positive mental health than their white or Latinx peers, later cohorts of white and Latinx individuals had increased levels of positive mental health compared to Blacks. Additionally, this study reveals a negative association between income and positive mental health for Black individuals but a positive association for white individuals. This study makes a novel contribution to the field by investigating racial/ethnic differences in young adults and by including time trends for racial/ethnic differences in positive mental health. More research is needed to understand the mechanisms by which the levels of positive mental health are changing for different racial/ethnic groups.

Chapter 4:

Arts Education in US Public Secondary Schools: Investigating Trends Over Time and by Student Race/ethnicity, Student Income, and No Child Left Behind

ABSTRACT

Few prior studies have described trends in equity or investigated the impact of No Child Left Behind (NCLB) on arts education availability in public secondary schools. This is the first, to my knowledge, to use nationally representative data and state-level indicators (N=106,060 Teachers, 22,840 schools) to address these questions. The study has three aims: to investigate 1) differences in arts availability by school-level proportion students of color and students eligible for free-or-reduced lunch, 2) trends of arts availability over time and with the introduction of No Child Left Behind, and 3) whether there were differential effects of No Child Left Behind by proportion students of color and free-or-reduced-lunch on arts availability. Aims 2 and 3 utilize a difference-in-difference analysis comparing states without accountability policies prior to the implementation of NCLB (treatment) and those with prior accountability policies (control). The results show 1) an overall negative association between arts availability and the percent of students eligible for free-or-reduced-lunch and students of color, 2) an increase in arts education availability from 1994-2000, followed by a decrease from 2000-2012, but no discernable impact of NCLB on arts availability based on treatment group, and 3) no significant differences in the potential impact of NCLB on arts availability for different subgroups based on percent students of color or percent low-income students. Data on arts education availability and equity are quite scarce and of poor quality, and no nationally representative data with state-level indicators exist to test whether these trends continue after 2012. Given the value of arts education to student development and achievement, policymakers should invest in increasing data availability and improving both the quality and equity of arts education for students from all backgrounds.

INTRODUCTION

Arts education in the US occupies a complicated position in the discourse of public education policy, described as "perennially weak" by some (Eisner, 2000; Koza, 2010; Shaw, 2019, p. 194), yet lauded as a high priority and a core subject by others (Colwell, 2005; Grey, 2009). Limited data exists to fully represent the availability and quality of arts education nationally, and the studies that have investigated this issue present mixed findings. No Child Left Behind (NCLB), a federal education policy implemented from 2002 to 2015, led to sweeping changes in the way that US public education functions, yet its impact on the availability and quality of arts education has yet to be fully examined. NCLB was initially framed as a way to narrow achievement gaps between students from advantaged and disadvantaged communities, focusing specifically on low-income students and students of color (Darling-Hammond, 2007). Yet there is little evidence to suggest that NCLB accomplished this goal and in some cases, evidence suggests that NCLB actually exacerbated inequities (Clotfelter et al., 2004; Orfield, 2004). This study has three objectives: (a) to test whether there is an association between arts education availability and school-level proportions of students of color and students eligible for free or reduced lunch, (b) to test whether NCLB reduced the availability and quality of arts education and (c) to test whether any effects of NCLB differ by school-level proportion of students of color or low-income students.

BACKGROUND

The Importance of Arts Education

Arts education predicts better academic and behavioral outcomes for children and youth (Bowen & Kisida, 2019; Catterall, 2009; Catterall et al., 1999; Deasy, 2002; Heath et al., 1998; Todhunter-Reid, 2018). Controlling for SES and other factors, an increase in the quantity of arts education is linked with higher academic achievement (R. A. Baker, 2012; Catterall et al., 1999),

better school attendance (Heath et al., 1998), and higher involvement in other activities like science fairs and student government (McLaughlin, 2000). Involvement in afterschool music programs has been linked with increased neuroplasticity, language development, reading comprehension, and communication in children from disadvantaged backgrounds (Kraus, Hornickel, et al., 2014; Kraus, Slater, et al., 2014a, 2014b; Kraus & Anderson, 2015). In a longitudinal cross-lag study with child-level fixed-effects, the amount of arts education predicted academic achievement from kindergarten through fifth grade, and the relationship grew stronger with each grade (Todhunter-Reid, 2018). Results from a meta-analysis suggest that arts education skills transfer to higher learning in other subjects, and also increase self-motivation, social skills like tolerance and empathy, and positive peer interactions (Deasy, 2002). A recent randomized control trial of over 10,000 elementary and middle school students shows strong evidence that arts education may lead to a decrease in disruptive behavior, improvements in writing, and increases in compassion for others, school engagement, college aspirations, and empathy (Bowen & Kisida, 2019). Arts education also predicts persisting positive outcomes: those with higher levels of arts participation in school had greater overall academic success and prosocial outcomes in their mid-twenties (Catterall, 2009). Given the evidence showing that arts education may lead to many positive outcomes, one might assume that it is widely available and of high quality. Yet little is known about the quality of arts education and to whom it is available.

No Child Left Behind

It is often suggested that arts education in public schools has decreased over the last twenty years, especially due to the introduction of the federal education policy, No Child Left Behind (NCLB) (Beveridge, 2009; Chappell & Cahnmann-Taylor, 2013; Irwin, 2018). Yet this narrative has yet to be fully investigated, and is currently based mostly on anecdotal evidence, one-time small-scale

surveys, and expert opinion. This study tests whether trends over time and the introduction of NCLB are associated with a decrease in arts education availability and quality.

NCLB is the reauthorization of the Elementary and Secondary Education Act (ESEA) in 2002 which dramatically increased the role of the federal government in holding schools accountable for student achievement (Elpus, 2014). Schools were held accountable to meeting Adequate Yearly Progress which included overall school achievement and key subgroup achievement (English language learners, low-income students, and students of color). NCLB narrowly prioritized academic achievement through performance on state tests in mathematics and English language arts. Schools incurred penalties if students did not meet specific absolute or growth benchmarks each year. NCLB did reclassify arts education as a core subject, along with foreign languages, civics and government, economics, history and geography, English language arts, math, and science (Ruppert & Nelson, 2006). However, arts was not a tested subject and thus did not count toward Adequate Yearly Progress (Beveridge, 2009).

Due to the threat of serious penalties, there is evidence that schools changed their practices, including teaching to the test (focusing heavily on the material that is being tested rather than a comprehensive study of the subject), focusing on the so-called "bubble kids" (giving extra attention to students who are on the cusp of two achievement categories making them easiest to move from a lower to an upper category) and narrowing the curriculum (increasing time spent in math and English while decreasing non-tested subjects such as art, music, foreign language, social studies, and science) (Amrein-Beardsley, 2009; Beveridge, 2009; Heilig et al., 2010; Pederson, 2007). This last change may have resulted in a reduction in the availability of arts education. Using the Schools and Staffing Survey (SASS), one study found that math and English crowded out science education in elementary schools, which accordingly declined from a peak of 3 hours per week in 1994 to a low of 2.3 hours in 2004 and 2008 (Blank, 2013). Similar decreases have been found for social studies

education in elementary schools (Dee et al., 2013; Fitchett et al., 2014; Fitchett & Heafner, 2010; Heafner & Fitchett, 2012).

Evidence suggests that NCLB led to administrative changes as well. Dee et al., 2013 used the Common Core of Data and the Schools and Staffing Survey to compare states that had strong accountability measures before NCLB to states that did not. They found that there was an average increase of $600 per-pupil-per-year-expenditures for treatment states after NCLB. Using the Schools and Staffing Survey and focusing only on self-contained classrooms (where students do not rotate between classes), they found an increase in time spent on math and reading with a commensurate decrease in science and social studies. They did not find an overall increase in total instructional time.

Studies on the Availability of Arts Education and NCLB

Evidence related to the impact of NCLB on the availability of arts education is scant and inconsistent. In small-scale studies, some of which are not peer-reviewed, teacher and administrator reports support the narrative that the curriculum has narrowed (Farkas Duffett Research Group, 2012; Spohn, 2008). Teacher reports suggest that the introduction of NCLB also spurred increased issues with scheduling and workloads, and reduced funding for arts education (Robert, 2010). In a small survey of school districts, district administrators reported that NCLB decreased time spent in arts education (McMurrer & Kober, 2007). In a one-time survey of state arts agencies, most states reported budget cuts to arts education funding (Dwyer, 2011). In a survey of 179 principals across Ohio, while their "attitude toward music was favorable," 43 percent said music programs were weakened since passage of NCLB (Gerrity, 2009). Results from the Survey of Public Participation of the Arts, a nationally-representative survey of adults, show a decrease in participation in arts

education from 1980 to 2012 (Rabkin & Hedberg, 2011). In a study of Louisiana in 2008, the majority of eighth graders in public schools had no arts education (R. A. Baker, 2012).

Findings from the few larger, nationally representative studies about arts education have been mixed, suggesting little overall change in the number of schools or students who participated in at least some arts education over time. To my knowledge, there have only been two nationally representative studies using quantitative data to investigate changes in arts education. A study of the National Assessment of Educational Progress (NAEP) of years 1999-000 and 2009-10 finds no change in the number of schools that offered art and music education (Parsad & Spiegelman, 2012). However, in 2009-10, there were enormous student-to-teacher ratios, in which one art teacher frequently taught several hundred students. Information on student-teacher ratios was unavailable for the 1999-2000 school year, so longitudinal comparisons are not possible. Art teachers in this study also reported low levels of support for their teaching in 2009-10.

Another nationally representative study of high school transcripts from 1982 to 2009 showed no overall change in the number of students who took at least one music course during high school after the introduction of NCLB (Elpus, 2014). Descriptive statistics showed that the proportion of students who enrolled in at least one music class during high school remained stable over that time period at around 32 to 35 percent. Notably, the number of students taking more than one music class increased during that time period, starting at 13.82 and increasing to 18.90, then from 2000 to 2009 decreased slightly each year, ending at 17.38 in 2009.

Elpus uses an abbreviated interrupted time series design to investigate the potential impact of NCLB by comparing public and private high schools (2014). The study does not examine state-level variation because the data are not meant to be representative at the state level. The study finds that enrollment in at least one music course becomes significantly and meaningfully lower in public

schools (affected by NCLB) compared to private schools (not covered by NCLB) after the introduction of NCLB.

The private school comparison group could be problematic because of potential history bias: the author notes that during the time period when NCLB was introduced in 2002, the sexual abuse scandal with Catholic priests had just been made public, and parents were pulling their students out of Catholic schools. This would be an issue for the analysis if the students filtering into public schools were systematically more or less likely to enroll in music education. This is possible given the finding that parents who pulled their students out of Catholic schools tended to be more educated.

Overall, teachers and districts report a decline in arts education, but larger quantitative studies do not show consistent results. These contradictions are difficult to resolve given the limited data available in the previous studies. There has yet to be a study of state-level differences in arts education over time using large, nationally representative data.

Equity and Arts Education Availability

Evidence suggests that arts education availability is inequitable across student race/ethnicity and income levels. The Survey of Public Participation of the Arts found that the decline of arts education over the last three decades was steeper for people of color (Rabkin & Hedberg, 2011). In the recent study of the National Assessment of Education Progress (NAEP) and the Fast Response Survey System, though there was no significant change in the full sample, the proportion of high-poverty schools offering music decreased from 100 percent to 82 percent from 1999-00 to 2009-10. (Parsad & Spiegelman, 2012). In the recent nationally representative study of high school transcripts, Elpus found that white students had a non-significant increase in music enrollment, Asian students had a significant increase, and African American students had no change (2014). For Hispanic students, English language learners, and students with Individualized Education Plans, there was a

decrease in music enrollment after NCLB. A study of California schools also found that arts education was not as available in low-income schools and schools with large populations of students of color (Gallagher et al., 2008).

Current Study Contribution

This study accomplishes three aims: investigating whether 1) there are differences in arts availability by race/ethnicity and low-income status in public secondary schools, 2) there are changes in arts availability and arts quality factors such as arts professional development and certified arts teachers for secondary public schools over time and due to the introduction of NCLB, and 3) whether any changes due to NCLB were different based on student race/ethnicity and income level at the school level.

METHODS

Data

The School and Staffing Survey (SASS) is a nationally representative sample of teachers, principals, and schools that the US Department of Education conducted seven times between 1987 to 2012 (1987-88, 1990-91, 1993-94, 1999-00, 2003-04, 2007-08, 2011-12). The SASS covers both public and private schools and includes grades K-12. As such, it is the most comprehensive study designed to describe the context of elementary and secondary public and private schools in the U.S. (McMurrer & Kober, 2007).

The SASS sample was selected through a stratified probability sample design to obtain reliable state-level estimates. Schools were selected and assigned sample weights based on sector, location, school level, and population. Stratification started at the school level. The school-level sampling frame comes from the Common Core of Data (CCD). Within schools, a school

administrator filled out the Teacher Listing Form, which lists all the teachers and their positions. From this form, teachers were stratified and sampled based on the following characteristics:

A. new teachers expected to stay at their current school;

B. mid-career and highly experienced teachers expected to stay at their current school;

C. new teachers expected to leave their current school;

D. mid-career teachers expected to leave their current school; or

E. highly experienced teachers expected to leave their current school (Tourkin et al., 2010).

An average of three to eight teachers were sampled per school, with a minimum of 1 and maximum of 20.

This study utilizes the SASS Teacher Survey and School Survey from 1994 to 2012. The Teacher Survey is collected for the teachers sampled from each school (not all teachers in a given school). The Teacher Survey includes a table which lists each subject, grade level and number of students for a given teacher's course load. Arts and music options include art or arts and crafts, art history, dance, drama or theater, and music. For public schools, SASS yields representative estimates at the state level (Cox et al., 2017). Sample sizes and response rates by year can be found in Appendix 4-A.

Measures

Teacher Survey

- Arts education participation*:* This variable is calculated at the teacher 'level. Teachers report the subject and enrollment for all courses they teach. The numerator of the measure is the number of students enrolled in arts classes (art or arts and crafts, art history, dance, drama or theater, or music). The denominator is total enrollment in all courses reported by the

teacher. Thus, the measure approximates the proportion of the "school week" that an average student spends in arts education, assuming each course is conducted with the same amount of time per week. At the teacher level, the vast majority of enrollment is either all arts or no arts, so this measure was changed into a dichotomous variable at the teacher level: any enrollment in arts vs. no enrollment in arts.

- Main teaching assignment: Teachers identify their main teaching assignment. Those who identified art or arts and crafts, art history, dance, drama or theater, or music as their main teaching assignment were categorized as arts teachers. The variable used in regression models is a dichotomous variable: arts teacher versus teachers of any other subject.
- Certification in main teaching assignment: Teachers were able to list several certifications. This variable equals 1 if any of those certifications were in the arts for teachers whose main teaching assignment is art.
- Professional development in main teaching assignment: Teachers were asked if they had participated in any professional development in their main teaching assignment that school year. This variable equals 1 if teachers indicated any subject-specific professional development for teachers whose main teaching assignment is art.
- Year: a continuous variable, which includes 1994, 2000, 2004, 2008, and 2012 (the year denotes the second year within a school year, i.e., the school year 2003-04 is denoted 2004).

School Survey Covariates

- Percent Students of Color: At the school level, the percent of Black, Latinx, Asian, Hawaiian/Pacific Islander, and American Indian/Alaskan Native students;
- Percent Free-or-Reduced-Lunch: At the school level, the percent of students who quality for Free-or-Reduced-Lunch, a marker for low income students;

- Median Percent of Students of Color: A dichotomous variable, 1=higher than median percentage of students of color and 0=lower than median percentage;
- Median Percent of Free-or-Reduced-Lunch: A dichotomous variable, 1=higher than median percentage of students eligible for free or reduced lunch and 0=lower than median percentage;
- Length of school day (in minutes)*;* and
- School size*:* Number of students enrolled in a school.

State and Regional Covariates

- Log of Per Pupil Expenditures in 1994: The first year of the survey was used since state-level values across years were highly correlated. This information comes from the National Public Education Financial Survey (National Center for Education Statistics, 2014); and
- Census Region: Includes West, South, Midwest, and Northeast, derived from the US Census and SASS state-level indicators.

Variables related to the impact of NCLB

- Treatment: The treatment group includes all states that did not implement an NCLB-like accountability model before NCLB was implemented. The control group includes states that *did* have a consequential accountability policy before NCLB (see Appendix 4-B for list). This variable is adapted from Dee & Jacob (2011);
- Post: A dummy variable, 1 for years after NCLB (2004, 2008 and 2012) and 0 for years before (1994 and 2000); and
- Years-Post-NCLB: This variable is 0 for the years before NCLB (1994 and 2000) and year as a continuous variable for years after NCLB was implemented.

Study Design

The dataset employs a repeated, cross-sectional design that does not include repeated measures for all of the same schools or teachers over time, but rather includes a stratified random sample representative at the state and national level for each wave. This sample includes public, secondary schools (middle schools and high schools) with a departmental structure (in which the students rotate between classes and teachers teach several different groups of students throughout the day) for years 1994-2012. This sample excludes private and charter schools, elementary schools, Indian schools and self-contained classrooms (where students do not rotate from class to class). The unit of analysis is the teacher.

For Aim 1, the design is associational, looking across years at the relationship between percent students of color and percent students eligible for free or reduced lunch and the availability of arts education. For Aim 2, the study utilizes a difference-in-difference analysis over five waves of data spanning 18 years. The difference-in-difference design examines two sets of differences: treatment vs. control, before and after the implementation of a policy (in this case, NCLB in 2002). In Aim 3, there is an additional 'difference' for each of the two models: high versus low proportion of students of color and high versus low proportion of students eligible for free or reduced lunch. Thus, Aim 3 utilizes a difference-in-difference-in-difference model.

An important attribute of a Difference-in-Difference analysis is a reasonable comparison group that would not be impacted by the treatment, in this case, NCLB accountability. Before NCLB, there were several states that already had consequential accountability policies. Thus, the assumption is that NCLB did not substantially impact the educational environment in these states. I will utilize the taxonomy of consequential state-level accountability polices developed by Hanushek and Raymond (2005) and refined by Dee and Jacob (2011) to determine which states had

accountability policies similar to NCLB before NCLB was implemented (Dee & Jacob, 2011; Hanushek & Raymond, 2005).

Several potential trajectories for arts education would indicate a difference over time for the control group (already had a consequential accountability framework in place) vs. the treatment group (accountability framework first introduced during NCLB). The assumption, if NCLB did impact the treatment group, is that there will be a larger rate of decrease after the introduction of NCLB in arts education and compared to the trajectory of the control group.

Analysis Plan

This is an associational and quasi-experimental study investigating differences in arts education availability 1) by race/ethnicity and income level, 2) with the introduction of NCLB, and 3) with NCLB differentially across student race/ethnicity and income levels. Descriptive analyses show the weighted means and standard deviations for all study characteristics in total and by survey year along with histograms of distributions. Descriptive analyses were calculated at the level of interest (teacher information at the teacher level, school information at the school level). Logistic regressions with teacher-level weights, Balance-Repeated replication weights, and census region fixed effects, adjusting for school and state-level covariates were conducted for arts availability and art as main teaching assignment for the full sample (N=106,060) and content-specific professional development and arts certification for arts teachers only (N=8,200). Spline variables were included to model potential differences in slope before and after the introduction of NCLB. All analyses were run using STATA 14.2.

Aim 1: Associational Model Investigating the Relationship between Availability of Arts Education and Percent Students of Color or Percent Free or Reduced Lunch with Spline Variables for Year

$$Y_{it} = \beta_0 + \beta_1 YEAR_t + \beta_2(Years\ Post\ NCLB_t) + \beta_3(Percent\ SOC_i) + \beta_4(Percent\ FRL_i) + \beta_5 X_{it} + \beta_6 E_s + u_r + \varepsilon_{it}$$

Where

Y_{it} represents the outcome for teacher *i* in year *t*

$YEAR_t$ represents year *t*

$Years\ Post\ NCLB_t$ represents a continuous variable for year within the years after NCLB was implemented (2004, 2008 or 2012)

$Percent\ SOC_i$ is a continuous variable for school-level percent of students of color, identified in the teacher record

$Percent\ FRL_i$ is a continuous variable for school-level percent of students eligible for free or reduced lunch, identified in the teacher record

X_{it} represents covariates at the school level (length of school day and school size), identified in the teacher record

E_s represents average per pupil expenditures at the state level (in 1994)

u_r represents regional fixed effects, corresponding to census regions

ε_{it} represents a random error

The variables of interest in this model are Percent SOC (β_3) and Percent FRL (β_4).

Aim 2: Difference-in-Difference Model Investigating the Potential Impact of NCLB on Arts Education Availability

$$Y_{it} = \beta_0 + \beta_1 YEAR_t + \beta_2 Post_t + \beta_3(Years\ Post\ NCLB_t) + \beta_4 T_s + \beta_5(T_s \times Post2002_t) + \beta_6(T_s \times Year\ Since\ NCLB_t) + \beta_7 X_{it} + \beta_8 E_s + u_r + \varepsilon_{it}$$

Where

Y_{it} represents the outcome for teacher *i* in year *t*

$YEAR_t$ represents year *t*

$Post_t$ is a dummy indicator (1 for observations in 2004, 2008 and 2012, 0 for observations in 1994 and 2000)

$Years\ Post\ NCLB_t$ represents a continuous variable for year within years after NCLB was

implemented (2004, 2008 and 2012)

T_s is the treatment variable, indicating which states did NOT already have strong accountability before NCLB was implemented

X_{it} represent is a vector of covariates at the school level, identified in the teacher record

E_s represents average per pupil expenditures at the state level (in 1994)

u_r represents regional fixed effects, corresponding to census regions

ε_{it} represents a random error

This model measures both the potential level (β_5) and trend (β_6) changes of the effect of NCLB on levels of arts education enrollment. If NCLB were to have a negative impact on the availability of arts education for the treatment group, either $\hat{\beta}_5$, $\hat{\beta}_6$, or both would be statistically significant with odds ratios below 1.

Aim 3: Difference-in-Difference-in-Difference Model Investigating the Potential Differential Impact of NCLB on Arts Education Availability for Schools with Higher vs. Lower Proportions of Students of Color and Low-Income Students

$$\begin{aligned} Y_{it} = {} & \beta_0 + \beta_1 YEAR_t + \beta_2 Post_t + \beta_3 (Years\ Post\ NCLB_t) + \beta_4 Subgroup_i + \beta_5 T_s \\ & + \beta_6 (T_s \times Year_t) + \beta_7 (T_s \times Post_t) + \beta_8 (T_s \times Year\ Since\ NCLB_t) \\ & + \beta_9 (Subgroup_i \times T_s) + \beta_{10} (Subgroup_i \times Post_t) \\ & + \beta_{11} (Subgroup_i \times Years\ Post\ NCLB_t) + \beta_{12} (Subgroup_i \times T_s \times Post_t) \\ & + \beta_{13} (Subgroup_i \times T_s \times Years\ Post\ NCLB_t) + \beta_{14} X_{it} + \beta_{15} E_s + u_r + \varepsilon_{it} \end{aligned}$$

Where

Y_{it} represents the outcome for teacher *i* in year *t*

$YEAR_t$ represents year *t*

$Post_t$ is a dummy indicator for observations in 2004, 2008 and 2012

$Years\ Post\ NCLB_t$ represents the year for years after NCLB was implemented (2004, 2008 and 2012)

T_s is the treatment variable, indicating which states did NOT already have strong

accountability before NCLB was implemented

$Subgroup_i$ is a dichotomous variable representing different levels of school-level demographic characteristics (1=schools with higher than median proportion of students of color, 0= lower than median; or 1=schools with higher than median proportion of students eligible for free or reduced lunch, 0=lower than median), identified in the teacher record

X_{it} represents covariates at the school level (length of school day and school size), identified in the teacher record

u_r represents regional fixed effects, corresponding to census regions

ε_{it} represents a random error

This model measures both the potential level (β_{12}) and trend (β_{13}) changes of the effect of NCLB on levels of arts education enrollment based on subgroup. If NCLB were to have a positive impact on the availability of arts education for schools with high levels of students of color or students on Free-or-Reduced-Lunch in the treatment group, either β_{11}, β_{12}, or both would be statistically significant with odds ratios greater than 1.

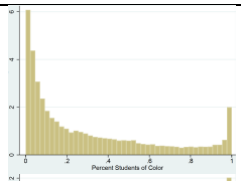
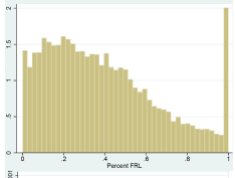
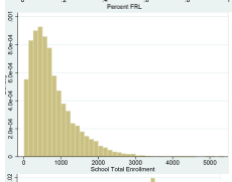
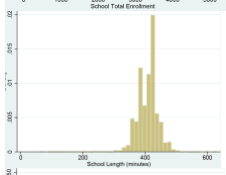
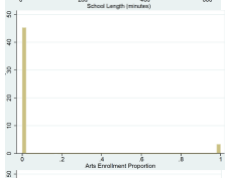
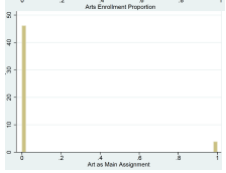
RESULTS

Table 4-1 presents a description of the sample, total means and by wave from 1994 to 2012. A large portion of schools have close to zero students of color and there is another peak at one hundred percent students of color. Though the sample mean of students of color is 35.9 percent, there is a steady increase over time from a low of 28.5 percent in 1994 to a high of 41.4 percent in 2012. A similar trend is evident for percent students eligible for free-or-reduced lunch, from a low in 1994 of 34.3 percent to a high in 2012 of 47.1 percent. Based on the distribution of the proportion of arts enrollment, which has a peak at zero and one hundred percent, it is clear that the vast majority of teachers who teach art are not teaching other subjects as well. 7.6 percent of teachers report art as their main teaching assignment. Most art teachers are certified in art, but this percentage is decreasing over time from a high in 1994 of 98.0 percent to a low of 91.4 percent in 2012. The

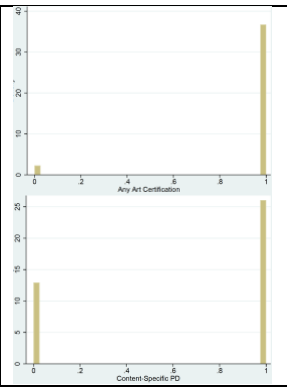
opposite is true for arts teachers who have received content-specific professional development, which increased from 53.0 percent in 1994 to 78.3 percent in 2012.

Table 4-1: Weighted Percentages and Means of Schools and Staffing Survey (SASS) School and Teacher Characteristics – Total and by Age Group

Full Sample Subpopulation Total=5,840,680 teachers; Unweighted N = 106,050 teachers, 22,830 schools

	Total	1993-94	1999-00	2003-04	2007-08	2011-12	
School-level Percent Students of Color	35.9%	28.5%	32.2%	34.8%	39.2%	41.4%	
School-level Percent Free-or-Reduced-Lunch	40.1%	34.3%	34.5%	39.9%	41.8%	47.1%	
Total School Enrollment (students)	845	800	853	846	856	855	
School Day Length (Minutes)	408	402	406	406	410	412	
Teacher-level Proportion of Arts Enrollment	6.6%	6.4%	7.1%	6.7%	6.4%	6.5%	
Art as Main Teaching Assignment	7.6%	7.3%	8.4%	7.5%	7.2%	7.5%	
Census Region							
Northeast		19.7%	20.3%	20.2%	19.4%	20.2%	
Midwest		26.4%	24.9%	22.3%	22.2%	22.3%	
South		37.9%	38.5%	40.5%	39.9%	40.0%	
West		15.9%	16.3%	16.9%	18.4%	17.4%	

Art Teachers Only Subpopulation Total=441,700 Teachers; Unweighted N = 8200 teachers

Any Arts Certification	93.8%	98.0%	96.3%	91.3%	93.1%	91.4%	
Content-specific Professional Development	69.5%	53.0%	51.3%	77.2%	81.7%	78.3%	

NOTE: Sample weights used to calculate sample characteristics. Unweighted sample sizes rounded to nearest 10.
SOURCE: U.S. Department of Education, National Center for Education Statistics,
Schools and Staffing Survey (SASS), "Public Teacher Questionnaire," "Public School Questionnaire," Selected years 1993-2012.

Table 4-2 presents logistic regressions for Aim 1 with the full sample, investigating the relationship between school demographic characteristics (percent students of color and percent free-or-reduced-lunch) and arts availability (arts enrollment and art as a main teaching assignment). The results show a significant, negative relationship between the percent students of color and availability of arts, measured both in reduced arts enrollment (OR: 0.713 [p<0.001]) and reduced access to art teachers (OR: 0.755 [p=0.001]). Similarly, and controlling for the percent students of color, the percent of students eligible for free or reduced lunch is significantly associated with reduced arts enrollment (OR: 0.820 [p=0.046]) but not significant for reduced access to arts teachers (OR: 0.866 [p=0.106]) To put these results in context, marginal effects predict that for schools with zero percent students of color, 7.1 percent of enrollment is in the arts and 8.1 percent of teachers are arts teachers compared to 5.2 percent enrollment in the arts and 6.2 percent arts teachers at schools with 100 percent students of color. Similarly, marginal effects predict that for schools with zero percent students eligible for free or reduced lunch, 6.8 percent of enrollment is in the arts and 7.8 percent of teachers are arts teachers compared to 5.7 percent enrollment in the arts and 6.8 percent arts teachers at schools with 100 percent students eligible for free or reduced lunch.

Table 4-2: Logistic Regressions Investigating the Relationship between School-level Student Demographic Characteristics and the Availability of Arts Education (via Arts Enrollment and Number of Arts Teachers)

	Arts Enrollment Proportion	Art as Main Teaching Assignment
	OR	OR
VARIABLES	(P-value)	(P-value)
Percent Students of Color	**0.713*** **	**0.755*** **
	(<0.001)	**(0.001)**
Percent Free-or-Reduced Lunch	**0.820***	0.866
	(0.046)	(0.106)
Year	1.016	**1.019***
	(0.084)	**(0.028)**
Year Since NCLB	0.980	**0.975***
	(0.115)	**(0.034)**
Total School Enrollment (Students)	1.000	1.000
	(0.383)	(0.995)
Length of School Day (Minutes)	**1.002****	**1.002****
	(0.005)	**(0.010)**
Census Regions (Reference Group - North East)		
Midwest	**1.211****	**1.285*** **
	(0.004)	**(<0.001)**
South	1.047	1.126
	(0.506)	(0.067)
West	1.056	**1.266****
	(0.511)	**(0.002)**
Per Pupil Expenditures (1994)	1.243	**1.307***
	(0.078)	**(0.024)**
Constant	0.000	**0.000***
	(0.046)	**(0.013)**
Total Observations (unweighted)	208,170	208,170
Subpopulation observations (unweighted)	106,050	106,050
Subpopulation Size (weighted)	5,846,680	5,846,680

* p<0.05
** p<0.01
*** p<0.001
NOTE: Unweighted sample sizes rounded to nearest 10. Sample weights and Balance-repeated Replication Weights used.
SOURCE: U.S. Department of Education, National Center for Education Statistics,
Schools and Staffing Survey (SASS), "Public Teacher Questionnaire," "Public School Questionnaire," Selected years 1993-2012.

Table 4-3 presents logistic regressions for Aim 2 with a difference-in-difference study design for NCLB comparing states with and without prior accountability, with the following dependent variables: arts enrollment and art as a main teaching assignment for the full sample and arts-specific teacher certification and arts-specific professional development for the arts teachers-only sample. Both interaction terms (between treatment states and the post-NCLB dummy variable and between treatment and the Years Post-NCLB spline variable) are small in magnitude and not significant,

suggesting no impact of this policy change. However, for the models with arts enrollment and art as a main teaching assignment, Year is positive and significant (OR: 1.019 [p=0.029] and OR:1.025 [p=0.003] respectively) and Years Post-NCLB is negative and significant (OR: 0.967 [p=0.015] and OR: 0.964 [p=0.008] respectively), suggesting a decrease in slope, regardless of treatment group, after NCLB was introduced. There is a significant positive relationship between arts-specific professional development and Post-NCLB (OR: 3.030 [p<0.001]). This result implies that over time, arts teachers are much more likely to have art-specific professional-development training.

Table 4-3: Logistic Regressions Investigating the Potential Impact of NLCB on the Availability and Quality of Arts Education with a Difference-in-Difference Design

	Full Sample		Arts Teachers Only	
	Arts Enrollment Proportion	**Art as Main Teaching Assignment**	**Any Arts Certification**	**PD in Art**
VARIABLES	OR (P-value)	OR (P-value)	OR (P-value)	OR (P-value)
Treatment	0.929	0.956	0.568	0.951
	(0.162)	(0.373)	(0.099)	(0.646)
Post	1.019	0.951	0.404	**3.030*** **
	(0.857)	(0.650)	(0.078)	**(<0.001)**
Years Post-NCLB	**0.967***	**0.964****	1.089	1.036
	(0.015)	**(0.008)**	(0.348)	(0.212)
Treatment X Post	0.902	0.905	1.102	1.200
	(0.382)	(0.403)	(0.874)	(0.576)
Treatment X Years Post-NCLB	1.021	1.018	1.044	0.978
	(0.134)	(0.202)	(0.485)	(0.606)
Year	**1.019***	**1.025****	0.889	0.987
	(0.029)	**(0.003)**	(0.132)	(0.477)
Percent Students of Color	**0.717*** **	**0.756*** **	**0.332****	0.923
	(<0.001)	**(0.001)**	**(0.001)**	(0.733)
Percent Free-or-Reduced Lunch	**0.818***	0.864	**2.540***	0.950
	(0.042)	(0.100)	**(0.034)**	(0.804)
Total School Enrollment (Students)	1.000	1.000	1.000	**1.000***
	(0.363)	(0.974)	(0.911)	**(0.014)**
Length of School Day (Minutes)	**1.002****	**1.002***	**1.006***	0.999
	(0.006)	**(0.011)**	**(0.017)**	(0.385)
Census Regions (Reference Group - North East)				
Midwest	**1.221****	**1.290*** **	0.850	**0.725***
	(0.004)	**(<0.001)**	(0.647)	**(0.014)**
South	1.078	1.143	0.654	1.213
	(0.315)	(0.061)	(0.336)	(0.325)
West	1.072	**1.276****	0.497	0.709
	(0.409)	**(0.001)**	(0.057)	(0.076)
Per Pupil Expenditures (1994)	**1.283***	**1.329***	0.646	0.875
	(0.038)	**(0.013)**	(0.466)	(0.601)

Constant	**0.000***	**0.000*****	5.903e+104	1.887e+12
	(0.013)	**(0.001)**	(0.122)	(0.436)
Total Observations (unweighted)	208,170	208,170	208,170	208,170
Subpopulation observations (unweighted)	106,050	106,050	8,200	8,200
Subpopulation Size (weighted)	5,846,680	5,846,680	441,700	441,700

* p<0.05
** p<0.01
*** p<0.001
NOTE: Unweighted sample sizes rounded to nearest 10. Sample weights and Balance-repeated Replication Weights used.
SOURCE: U.S. Department of Education, National Center for Education Statistics,
Schools and Staffing Survey (SASS), "Public Teacher Questionnaire," "Public School Questionnaire," Selected years 1993-2012.

Table 4-4 presents logistic regressions for Aim 3 with the full sample using a difference-in-difference-in-difference study design, comparing states with and without prior accountability for schools above and below median levels of students of color and free-or-reduced-lunch eligibility. Both interaction terms (between treatment states and the post-NCLB dummy variable and between treatment and the Years Post-NCLB spline variable) are small and not significant, suggesting no differential impact of the implementation of NCLB on schools with high proportions of students of color or students on free-or-reduced-lunch.

Table 4-4: Logistic Regressions Comparing Schools with Differing Demographic Characteristics and the Potential Impact of NLCB on the Availability of Arts Education using a Difference-in-Difference-in-Difference Design

Subgroup	**Students of Color**		**Free-or-Reduced-Lunch Eligible**	
	Arts Enrollment Proportion	**Art as Main Teaching Assignment**	**Arts Enrollment Proportion**	**Art as Main Teaching Assignment**
	OR	OR	OR	OR
VARIABLES	(P-value)	(P-value)	(P-value)	(P-value)
Proportion Subgroup (1=higher than Median Percentage)	0.858	0.830	0.949	0.890
	(0.113)	(0.050)	(0.556)	(0.131)
Treatment	0.904	0.910	0.945	0.936
	(0.067)	(0.094)	(0.297)	(0.187)
Proportion Subgroup X Treatment	1.037	1.111	0.872	1.008
	(0.742)	(0.323)	(0.223)	(0.936)
Post	0.983	0.902	1.056	0.936
	(0.888)	(0.387)	(0.645)	(0.591)
Years Post-NCLB	**0.969***	**0.967***	**0.963***	**0.966***
	(0.047)	**(0.027)**	**(0.012)**	**(0.024)**

Proportion Subgroup X Post	1.112	1.174	0.879	1.039
	(0.624)	(0.421)	(0.567)	(0.848)
Proportion Subgroup X Years Post-NCLB	0.993	0.992	1.008	0.994
	(0.772)	(0.729)	(0.745)	(0.796)
Treatment X Post	1.049	1.084	0.860	0.897
	(0.734)	(0.575)	(0.306)	(0.477)
Treatment X Years Post-NCLB	1.009	1.004	1.025	1.021
	(0.597)	(0.826)	(0.128)	(0.238)
Proportion Subgroup X Treatment X Post	0.734	0.686	1.180	1.005
	(0.226)	(0.137)	(0.537)	(0.983)
Proportion Subgroup X Treatment X Years Post-NCLB	1.021	1.025	0.991	0.997
	(0.474)	(0.430)	(0.743)	(0.919)
Year	**1.018***	**1.024****	**1.018***	**1.025****
	(0.035)	**(0.003)**	**(0.031)**	**(0.003)**
Total School Enrollment (Students)	1.000	1.000	1.000	1.000
	(0.253)	(0.890)	(0.914)	(0.470)
Length of School Day (Minutes)	**1.002****	**1.001***	**1.002****	**1.002***
	(0.010)	**(0.019)**	**(0.007)**	**(0.013)**
Census Regions (Reference Group - North East)				
Midwest	**1.239****	**1.308*****	**1.230****	**1.303*****
	(0.002)	**(<0.001)**	**(0.003)**	**(<0.001)**
South	1.061	1.132	1.025	1.099
	(0.430)	(0.079)	(0.746)	(0.174)
West	1.045	**1.254****	0.996	**1.204****
	(0.581)	**(0.002)**	(0.960)	**(0.009)**
Per Pupil Expenditures (1994)	**1.286***	**1.338****	1.234	**1.286***
	(0.024)	**(0.008)**	(0.070)	**(0.022)**
Constant	**0.000***	**0.000****	**0.000***	**0.000****
	(0.016)	**(0.001)**	**(0.015)**	**(0.001)**
Total Observations (unweighted)	208,170	208,170	208,170	208,170
Subpopulation observations (unweighted)	106,050	106,050	106,050	106,050
Subpopulation Size (weighted)	5,846,680	5,846,680	5,846,680	5,846,680

* p<0.05
** p<0.01
*** p<0.001
NOTE: Unweighted Sample sizes rounded to nearest 10. Sample weights and Balance-repeated Replication Weights used.
SOURCE: U.S. Department of Education, National Center for Education Statistics,
Schools and Staffing Survey (SASS), "Public Teacher Questionnaire," "Public School Questionnaire," Selected years 1993-2012.

DISCUSSION

This study had three aims: 1) to describe trends in equity of arts education availability across student income and race/ethnicity, 2) to test whether NCLB reduced the availability of arts education and 3) to test whether NCLB reduced the availability of arts education differentially based on student demographics at the school level. For Aim 1, the study finds that high income and predominantly white schools have higher levels of arts education availability than low-income schools and those serving predominantly students of color. In Aim 2, the study finds no evidence that the availability of arts is associated with the implementation of NCLB for the treatment group (states without accountability policies prior to the implementation of NCLB) compared to the control group. However, there is evidence that the availability of arts education was generally increasing from 1994 to 2000 and began to decrease from 2000 to 2012. The study also finds a general increase in content-specific professional development for arts teachers over the study period. For Aim 3, the study finds that no evidence that the association between availability of arts and the implementation of NCLB differs by proportion of students of color or students on free-or-reduced lunch at the school level.

Since the interaction terms in Aim 2 and Aim 3 for NCLB treatment were not significant, it is unclear what is driving the downward trend in arts availability after 2000. It is possible that NCLB caused such a strong cultural shift across the country that all states were impacted, even those with prior accountability policies. However, it is also possible that an entirely separate set of drivers are responsible for this decrease. One previous study finds similar trends for science education – that the quantity of science education for elementary schools decreased during the same time period for all schools, not just those in the NCLB treatment group (Blank, 2013). However, other studies found evidence that NCLB was the driver of decreases for social studies education, in which the treatment group had a larger decrease in social studies education than the control group (Dee et al., 2013). It would also be important to understand whether this downward trend in arts availability has

continued. However, the dearth of public-school arts education data makes this difficult – there are no nationally representative datasets with state-level representation for arts education availability after 2012, to my knowledge.

At its initial implementation, NCLB was reportedly intended to narrow achievement and accessibility gaps for low-income students and students of color (Darling-Hammond, 2007). It is possible that because schools with high proportions of vulnerable children were most at risk of penalty under NCLB, they would be the most likely to divert resources away from the arts. This study suggests that NCLB has not improved equity in arts education, but there is also no evidence that it has exacerbated inequities. However, with the demographics of US public schools changing over time, with higher proportions of low-income students and students of color each year, ensuring that arts education is accessible and abundant in all schools is more important than ever (Fry, 2007; Hochschild & Scovronick, 2005; Mordechay, 2017; Portes & Smagorinsky, 2010).

Perhaps as important as the novel findings of this study, it is clear that data limitations heavily constrain our understanding of arts education in the US. What we measure acts as an indicator of what we value. Data on reading and math are abundant, but there is very little on arts education and arts participation. There are several important questions about availability, quality and equity of arts education that do not appear to be possible to answer with any nationally representative data:

- What percentage of students have access to arts education and which types of arts do students have access to?
- Is access consistent across grade levels?
- What proportion of students participate in arts and which kind? and
- Is participation consistent across grade levels? (von Zastrow, 2018).

Appendix 4-C enumerates all available arts education datasets at the state or national level of which I am aware. SASS has been the most comprehensive dataset of public schools in the US (McMurrer & Kober, 2007), but the new version, the National Teacher and Principal Survey, is less comprehensive than before and is no longer representative at the state level. Additionally, although most states now have extensive systems to collect school-level administrative data, few states collect information about the quality or quantity of arts education available. Table 4-C-2 enumerates all administrative datasets available at the state level for arts education of which I am aware. Much of the preliminary information that was cross-checked in this table comes from the State Data Infrastructure Project on Arts Education from the Education Commission of the States (von Zastrow, 2018). This project aims to increase state-level data available about access and quality of arts education in the US. However, as shown in Table 4-C-2, few states have comprehensive data available on arts education quality and access.

Data limitations also do not allow us to fully understand the extent to which students of color and low-income students are disadvantaged in their access to the arts. An arts education equity framework proposes six different types of equity that are important: recognition, participation, access, effects, transformation, and distribution of resources (Kraehe et al., 2016). The data available for this study only approaches an investigation on participation and access but cannot illuminate whether there is equity in other facets of arts education. In their systematic review, Kraehe and colleagues find scant data and a patchwork of disconnected and low-rigor studies in the area of arts equity (2016). Thus, in order to understand the availability and inequities in arts education in US public schools, a better infrastructure for collecting and reporting this data is imperative.

Limitations

This study includes several limitations. First, data limitations did not allow an investigation of the availability of arts education in primary schools. Scholars suggest the bulk of the pressure for NCLB was at the primary level. Small, non-peer reviewed studies showed that secondary schools were more likely to employ full time arts teachers than primary schools (Gallagher et al., 2008) and art and music were more likely to be crowded out for English Language Arts and Math for primary schools compared to secondary schools (Farkas Duffett Research Group, 2012). A study of ECLS-K found decreases in kindergarten music, art, dance and theater from 1998 to 2010 (Bassok et al., 2016).

Additionally, there is evidence that a large portion of arts education is conducted by unpaid, temporary teachers and in after school programs (Gallagher et al., 2008). The data available did not allow an investigation of any changes in these programs.

Given the available data, the operationalization of 'arts availability' is less than ideal – it is the proportion of *sampled* teachers at the state level who are arts teachers and the proportion of *sampled* teachers at the state level who taught any arts courses. This dataset does not include all teachers at a given school, so this study heavily relies on the teacher sampling method to give an accurate assortment of teachers at the state level. This creates additional noise in the dataset and could skew the results if the sampling method is systematically connected to likelihood a teacher is an arts teacher. However, we do not have any reason to believe that these sampling strata are directly related to the likelihood that a sampled teacher is an arts teacher.

Future Directions

A better understanding of the quantity and quality of arts education in US public schools is needed. It is important to understand whether there are sequenced courses taught by highly skilled teachers, whether the art presented in courses reflects the diversity of the students, what percentage

of students participate in arts and during which grades, and what proportion of funding is allocated to arts education, among other questions.

CONCLUSION

This study is the first, to my knowledge, to use a national- and state-representative dataset to test the availability of arts education over time and finds that students of color and low-income students in public secondary schools have lower levels of access to arts education than their white and high-income peers. This study finds no relationship between arts education and the introduction of NCLB, regardless of student demographics, but does find that the availability of arts education has generally been decreasing from 2000 to 2012. In future studies, it would be important to better understand whether this downward trend has continued.

APPENDICES

Table 4-A: Wave-Specific SASS Sample Size and Response Rates for Teachers and Schools (unweighted)

Year	Teacher Sample Size	Teacher Response Rate	School Sample Size	School Response Rate
2011-12	44,760	77.7	10,250	72.5
2007-08	47,600	84.0	9,800	80.4
2003-04	52,480	84.8	10,200	80.8
1999-00	56,350	83.1	9,890	88.5
1993-94	53,000	88.2	9,530	92.3

NOTE: Sample sizes rounded to nearest 10.
SOURCE: U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey (SASS), "Public Teacher Questionnaire," "Public School Questionnaire," Selected years 1993-2012.

Table 4-B: State-Level Treatment Groups for NCLB Difference-In-Difference Models
(Treatment States are those without Consequential Accountability Policies Prior to the Implementation of NCLB)

State	Treatment Group
Alabama	Treatment
Alaska	Treatment
Arizona	Control
Arkansas	Treatment
California	Treatment
Colorado	Control
Connecticut	Treatment
Delaware	Treatment
Washington, DC	Control
Florida	Treatment
Georgia	Treatment
Hawaii	Control
Idaho	Control
Illinois	Treatment
Indiana	Treatment
Iowa	Control
Kansas	Treatment
Kentucky	Treatment
Louisiana	Treatment
Maine	Control
Maryland	Treatment

Massachusetts	Treatment
Michigan	Treatment
Minnesota	Control
Mississippi	Control
Missouri	Control
Montana	Control
Nebraska	Control
Nevada	Treatment
New Hampshire	Control
New Jersey	Control
New Mexico	Treatment
New York	Treatment
North Carolina	Treatment
North Dakota	Control
Ohio	Control
Oklahoma	Treatment
Oregon	Treatment
Pennsylvania	Control
Rhode Island	Treatment
South Carolina	Treatment
South Dakota	Control
Tennessee	Treatment
Texas	Treatment
Utah	Control
Vermont	Treatment
Virginia	Treatment
Washington	Control
West Virginia	Treatment
Wisconsin	Treatment
Wyoming	Control

(Adapted from Dee & Jacob, 2011, p. 423)

Appendix 4-C: Available Datasets Addressing Availability and Equity of Arts Education

Table 4-C-1: Study-Specific and National-Level Datasets Addressing Availability and Equity of Arts Education

Dataset	Years available (Sample Size)	Student Grades	Arts Variables	Level of Representation	Race/ethnicity Variables	Sampling Strategy	Citation
Schools and Staffing Survey	1994 (53,000 Teachers; 9,530 Schools); 2000 (56,350 Teachers, 9,890 Schools); 2004 (52,480 Teachers, 10,200 Schools); 2008 (47,600 Teachers, 9,800 Schools); 2012 (44,760 Teachers, 10,250 Schools)	K-12	Teacher-level enrollment counts in arts courses, and main teaching assignment for teachers (arts included)	National and State	Yes	Multi-stage probability design to ensure national and state representativeness	U.S. Department of Education, National Center for Education Statistics, Schools and Staffing Survey (SASS), "Public Teacher Questionnaire," "Public School Questionnaire," Selected years 1993-2012.
Early Childhood Longitudinal Study - Kindergarten (ECLS-K)	1998 (2500 Teachers), 2010 (2700 Teachers)	Kindergarten	Teacher reported subject, frequency and skills taught	National	Yes	Multi-stage probability design to ensure national representativeness	Bassok, D., Latham, S., & Rorem, A. (2016). Is Kindergarten the New First Grade? AERA Open, 2(1), 2332858415616358. https://doi.org/10.1177/2332858415616358
Survey from Farkas Duffett Research Group, 2012	2010 (1001 teachers)	3rd-12th grade	Teacher report on class-time, whether some subjects prioritized over others	National	Not for students or schools	Random, nationally representative	Farkas Duffett Research Group. (2012). Learning Less: Public School Teachers Describe a Narrowing Curriculum.
Survey from Robert, 2010	2009 (3412 administrators and teachers)	Elementary through higher ed	questionnaire of educator perceptions and opinions	Partial at the national level	No	Partial sample was randomized from NAEA membership	Robert, F. (2010). No Child Left Behind: A Study of Its Impact on Art Education. 4.

Survey from McMurrer & Kober, 2007	2007 (349 school districts)		administrator reports of instructional time and curriculum changes	National	No	Random, nationally representative	McMurrer, J., & Kober, N. (2007). Choices, changes, and challenges: Curriculum and instruction in the NCLB era. Centre on Education Policy.
Survey of Public Participation in the Arts	1982, 1992, 2002, 2008, 2012, 2017 (around 37,000 each year)	18 and over	ways that American adults (age 18 and older) engage in the arts, where that engagement takes place, and why adults participate in these activities.	National	Yes	Random, nationally representative	National Endowment for the Arts, and United States. Bureau of the Census. Survey of Public Participation in the Arts (SPPA), United States, 2017. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2019-02-04. https://doi.org/10.3886/ICPSR37138.v3
National Assessment of Educational Progress	2008, 2016 (8800 students)	8th grade	arts assessments and classroom environment	National and State	Yes	Multi-stage probability design to ensure national representativeness	Parsad, B., & Spiegelman, M. (n.d.). Arts Education In Public Elementary and Secondary Schools: 1999–2000 and 2009–10. 126.
Fast Response Survey System	1999 2008 (3430 elemntary teachers, 2660 secondary teachers)	4th and 8th grade	Arts availability	National	Yes	Random, nationally representative	Parsad, B., & Spiegelman, M. (n.d.). Arts Education In Public Elementary and Secondary Schools: 1999–2000 and 2009–10. 126.
10 large-scale studies of high school transcripts by the NCES from 1982-2009: Interuniversity Consortium for Political and Social Research, High School and Beyond, National Educational	1982 - 2009	9-12th grade	High school transcripts	National	Yes	Random, nationally representative	Elpus, K. (2014). Evaluating the Effect of No Child Left Behind on U.S. Music Course Enrollments. Journal of Research in Music Education, 62(3), 215–233. https://doi.org/10.1177/0022429414530759

Longitudinal Study (1982, 1992 and 2004), High School Transcript Study (1987, 1990, 1994, 1998, 2000, 2005, 2009).							
Survey of principals in Gerrity, 2009	2007 (179 principals)	K-12	Questionnaire of principal perceptions and opinions	Ohio	No	Random	Gerrity, K. W. (2009). No Child Left behind: Determining the Impact of Policy on Music Education in Ohio. Bulletin of the Council for Research in Music Education, 179, 79–93.

Table 4-C-2: State Administrative Datasets with Arts Education Information

State	Data Available?	Years	Level	Notes
California	Yes	1997-2017	school	
Texas	Yes	2000-2018	district	
Florida	Partial	2014-2018	district	
New York	No			
Illinois	No	Only includes the number of minutes in core subjects per week		
Ohio	Partial	2017-2018	district	
North Carolina	Yes	2001-2013	district	Would have to individually download each district dataset
Arizona	Partial	2018, potentially 2010 and 2014	district	
Arkansas	Yes	2001-2018	district	One figure for all arts participation
Connecticut	Partial	2013-2019	district	

Kentucky	Partial	2017-18	district	Could potentially request prior years here: https://education.ky.gov/districts/tech/Pages/DataRequests.aspx
Massachusetts	Yes	2007-2018	district	Count of students taking at least one arts course: http://profiles.doe.mass.edu/statereport/artcourse.aspx
NJ	Partial	2011-2018	district, school	Percent of schools with certain types of art
Oklahoma	Yes	2013-2018	state	
Tennessee	Yes	2016-2018	district, school	
Kansas	Unclear			
Maine	Unclear	Would have to individually search by teacher		
South Carolina	Partial			
Louisiana	Unclear	2008	student (37,000 8th graders)	Baker, R. A. (2012). The Effects of High-Stakes Testing Policy on Arts Education. Arts Education Policy Review, 113(1), 17–25. https://doi.org/10.1080/10632913.2012.626384

NOTE: Cross-checked with tables found in von Zastrow, 2018

Chapter 5:

Frequent Participation in Performing Arts Predicts Higher Positive Mental Health in Young Adults

ABSTRACT

Positive mental health is a critical component of overall good mental health, but our understanding of the potential drivers of positive mental health is lacking. Participation in the arts may contribute to positive mental health through the mechanism of flow, a mental state of becoming completely engrossed in an enjoyable activity and performing arts may be especially predictive of positive mental health due to its collective nature. This study uses the Population Study of Income Dynamics (PSID) Transition to Adulthood Sample (N=5,628 person-years) to investigate whether participation in performing arts predicts positive mental health in young adults through adjusted least squares and individual-level fixed effects regression models across three waves of data per individual. Additionally, the study investigates differential participation and strength of the relationship by race/ethnicity, income, and gender. Results show that, compared to no participation, participating in the performing arts at least once a week to almost every day is associated with an increase in positive mental health of a 0.111 effect size [$p=0.029$] and every day participation is associated with an increase in positive mental health of a 0.394 effect size [$p<0.001$]. White and higher income individuals are more likely to participate in the arts than people of color and lower income individuals. However, the association between performing arts and positive mental health is similar, if not greater, for people of color than it is for white individuals. This study shows strong associations between frequent performing arts participation and positive mental health and suggests that more resources should be allocated to performing arts access for young adults from diverse backgrounds.

INTRODUCTION

"The music can connect us to our earlier selves and to our better selves-to-come. It can remind us of where we fit on the time line of human achievement, an ultimate value of art," (Marsalis, 2009, p. 13). Wynton Marsalis, Pulitzer prize-winning composer, trumpet player, and jazz legend, describes the transcendent value he sees in jazz music. Artistic expression, shared with others, seems to be innately and uniquely human. It helps us make sense of the world around us and illuminates novel and profound concepts (Lomas, 2016b). Participating in artistic activities may also impact overall mental wellbeing. During young adulthood, childhood passions often give way to higher education and career goals; yet these childhood passions, such as art, may be important to prioritize for mental health, among other reasons.

This study has two aims: in young adults, 1) to investigate the relationship between different types of arts participation (performing arts; visual arts and writing) and positive mental health, and 2) to investigate whether there are differences in the relationship between performing arts participation and positive mental health by race/ethnicity, income and gender.

BACKGROUND

Art and Wellbeing

The healing properties of participating in creative activities have long been identified. From music to singing to writing and even comedy, art therapy is a well-recognized, though likely underutilized tool. Creative activities have been utilized for managing depression, anxiety, stress, and mental distress related to chronic illness and trauma, and promoting positive emotions, social connection, and self-efficacy for people with mental illness (K. C. Baker & Mazza, 2004; Crawford & Caltabiano, 2011; Olderog Millard & Smith, 1989; Pizarro, 2004; Reynolds & Lim, 2007; Ruud, 2008; Schnee, 1996). While art has been acknowledged for clinical purposes to treat mental illness, it

has received less attention in research for its potential utility in promoting positive mental health in a general population, especially among young adults.

Few studies have looked at the direct relationship between participating in art and positive mental health. In a qualitative study of 13 Black men in choirs, participants attributed their sense of belonging, and ability to cope with challenges in school and in the community, heal from experiences of racism, and succeed in school to their participation in choir (Hymon, 2020). In a 13-day study of 658 young adults, a cross-lagged analysis of diary entries suggested that participating in creative expression led to increased emotional wellbeing and overall positive mental health in the following days (Conner et al., 2018). In a study of 3,188 older adults in England from 2004 to 2015, those who engaged in sustained, frequent creative activity over several years had increased happiness and life satisfaction (Tymoszuk et al., 2019). In the same study, short-term engagement in creative activities did not yield significant outcomes, suggesting a dose response of frequency of arts activities and wellbeing (Tymoszuk et al., 2019).

These studies are suggestive of a possible relationship between arts participation and positive mental health, but they are limited in several ways. The first two studies have small sample sizes and either employ self-reports about past experiences, which could result in recall bias (Hymon, 2020), or have a very short-term study length (Conner et al., 2018) and do not employ quantitative methods that could shed light on long-term causal relationships. The third study focuses on older adults in England and does not delineate between participating in the creation of art versus appreciating art that others create (Tymoszuk et al., 2019) and thus may not be generalizable to the population or content of interest for this study (young adults in the US directly participating in the creation of art).

Using the Population Study of Income Dynamics (PSID) (the dataset utilized in this study), Foster and Marcus Jenkins investigate relationships between art participation and wellbeing, broadly defined (2017). In a study of the PSID Child Development Supplement (1997, 2002 and 2007) and

Transition to Adulthood Supplement (2007 only) with both adolescent (N=2,907) and young adult outcomes (N=963), Foster and Marcus Jenkins (2017) assessed whether participation in art or music lessons during adolescence is associated with adolescent outcomes such as reading and math achievement, behavior and social emotional health and young adult outcomes including high school graduation, GPA and arts participation. Simple associations show that many of the child development outcomes are correlated with arts participation. However, with propensity score weighting included, only young adult arts participation remained significant. This study also does not measure the direct relationship between arts participation and positive mental health for young adults. Thus, further research is needed to understand this relationship.

Positive Mental Health in Young Adults

Positive mental health encompasses feelings of belonging, purpose, and joy and has only recently emerged as a robust field of study. The three constructs of positive mental health generally acknowledged in the literature include emotional, social, and psychological wellbeing (Keyes, 2002, 2005). Emotional wellbeing includes positive affect and life satisfaction (Keyes, 1998, 2002; Ryff, 1989). Social wellbeing includes constructs such as social contribution, integration, and actualization. Psychological wellbeing includes constructs such as self-acceptance, personal growth, autonomy, and purpose. This study uses a scale with items from all three of these constructs (Keyes, 2002).

Positive mental health has been associated with positive functioning even after controlling for mental illness. For college students, positive mental health is associated with higher academic achievement and lower suicidal behavior (Keyes et al., 2012). For adults, positive mental health is associated with higher productivity and less health care use (Keyes & Grzywacz, 2005), and for older adults, quicker recovery from illness (Lamers, Bolier, et al., 2012), fewer daily activity limitations (Gilmour, 2015), and lower mortality (Keyes & Simoes, 2012). Due to the benefits that positive

mental health seems to offer individuals over the life course, it is important to understand what factors, environments, and opportunities contribute to positive mental health.

Aside from arts participation, studies of other potential predictors of positive mental health and its subscales (emotional, social, and psychological wellbeing) tend to be mixed or inconclusive. For instance, while some studies on adult populations of the relationship between age and emotional wellbeing find no significant relationship (Diener & Suh, 1997; Dittmann-Kohli et al., 2001; Mroczek & Kolarz, 1998; Schotanus-Dijkstra et al., 2016), another study found a positive relationship between age and emotional wellbeing (Westerhof & Keyes, 2010). The relationship between income and positive mental health (and its subscales) also remains unclear. In childhood and adolescents, studies have found a modest relationship between household income and life satisfaction (a component of emotional wellbeing) (Proctor et al., 2009), a slightly graded relationship between very low emotional wellbeing and income, though no relationship for higher emotional wellbeing (Nielsen et al., 2016), and a slight, negative relationship between being in the lowest income quartile during early childhood and positive mental health during adolescence (Gariepy et al., 2017). Studies of adults have found no relationship between income and emotional wellbeing or total positive mental health (Fischer et al., 2014; Westerhof & Keyes, 2010).

Some predictors are more consistently related to positive mental health and its subscales. Social support has been found to predict psychological wellbeing in adolescents (Ciarrochi et al., 2017), emotional wellbeing in adolescents (Ronen et al., 2016), and emotional wellbeing in adulthood (Schotanus-Dijkstra et al., 2016). Black adults are consistently found to have higher levels of psychological wellbeing (Ryff et al., 2003) and positive mental health (Keyes, 2009a) than white or Latinx adults. However, research on the predictors of positive mental health remains in its infancy, especially in relation to young adult populations.

This study particularly focuses on the young adults. Young adulthood is a critical developmental period which is often described as setting the trajectory for the remainder of adulthood (Bonnie et al., 2014). Young adulthood is often marked by major life transitions, such as leaving the family home, going to college, starting a career, and even finding a romantic partner and having children (Bonnie et al., 2014; Clifton, 2016). Few previous studies have investigated the positive mental health of young adults, especially those not in college.

Potential Pathways from Arts Participation to Higher Positive Mental Health

There are several proposed mechanisms by which participation in the arts might lead to higher levels of positive mental health. First, the relationship between wellbeing and creative expression may be explained by promoting intrinsic motivation and passion which leads to a state of flow (Vallerand et al., 2003). Flow can be defined as the experience of becoming totally engrossed in an activity, in which one creates effortlessly (Csikszentmihalyi, 1990, 1997b, 1997a). Nakamura & Csikszentmihalyi identify six defining characteristics of flow: (1) extreme concentration, (2) acute awareness linked with action, (3) loss of any focus on the self, (4) increased feelings of being in control, (5) altered sense of time, with time often feeling sped up, and (6) an activation of intrinsic motivation and reward (Nakamura & Csikszentmihalyi, 2014). In theoretical and empirical investigations, flow is perceived as a mediator between creative activities and heightened wellbeing (Mihaly, 1997; Rogatko, 2009). People who participate in activities that activate flow are more likely experience positive emotions and have a sense that their lives have meaning (Kaplan, 2000; Seligman, 2004). They are also more likely to have more positive relationships with others (Seguin-Levesque et al., 2003). Over time, adolescents who engage with something they are passionate about and experience flow have better mental health (Froh et al., 2010). Studies suggest that older adults who experience flow have better overall health (G. D. Cohen, 2006).

Creative expression, especially participation in musical activities, is a well-documented mechanism for experiencing flow. Studies suggest that choral singing can yield a state of community wholeness that can promote wellbeing (Tonneijck et al., 2008) and that dance and music can promote flow (Bakker, 2005; Hefferon & Ollis, 2006). Evidence suggests that playing music with others can generate "collective flow" or "participatory consciousness" (Lutz, 2009). Thus, it seems likely that through the mechanism of flow, participation in the arts, especially performing arts like music and dance, may promote positive mental health.

Lomas (2016) describes a few other potential causal pathways through which participation in arts may improve well-being: sense-making (understanding and finding meaning in life), enriching experience (feeling new and/or deep emotions), aesthetic appreciation (experiencing great beauty or skill), entertainment (having fun), and bonding (building connections with others via engaging in art together) (Lomas, 2016b). A modest amount of empirical evidence supports each of these pathways. Painting, drawing, and writing have been shown to assist individuals in making sense of past experiences and traumas and re-write damaging narratives about their lives (Pizarro, 2004; Reynolds & Lim, 2007). Making music has been shown to promote altered sense of reality and spiritual ecstasy, creating conditions for channeling deep emotional states with high levels of clarity (Leuba, 2013; Sylvan, 1999). Engaging with a beautiful work of art has been shown to create the emotional state of awe (Keltner & Haidt, 2003). Acting in a theater production has been found to bring people together and foster deep relationships (Burgoyne et al., 1999). These potential causal pathways have not yet been extensively studied but offer potential preliminary explanations for the relationship between positive mental health and arts participation.

Given the strong evidence of the relationship between performing arts (music and dance especially, as well as theater) and flow, this study hypothesizes that performing arts will being more strongly predictive of positive mental health than other types of arts participation.

Equity and Arts Participation

Equity of access is an important issue in participation in the arts. Studies suggest that white individuals and those from high-income backgrounds are more likely to have access to opportunities for arts participation than people of color and those from low income backgrounds (Elpus, 2014; Gallagher et al., 2008; Parsad & Spiegelman, 2012; Rabkin & Hedberg, 2011). Studies have found access to arts participation to be lower for students of color in elementary and middle school (Parsad & Spiegelman, 2012), high school (Elpus, 2014), and in adults (Rabkin & Hedberg, 2011).

Foster and Marcus Jenkins find that well-resourced parents (in terms of education and income) were more likely to provide art or music lessons for their children (2017). Using propensity score weighting, a fairly rigorous method of mitigating unobserved confounders, the study suggested that privilege and wealth are highly related to opportunities such as music and arts lessons. The study presents doubts on whether arts participation is related to other outcomes such as academic achievement and wellbeing after confounders of wealth and privilege are accounted for. The authors interpret their findings as suggesting that benefits of participation in the arts found in previous studies may be detecting family resources and privilege rather than the effects of arts themselves (2017). However, other studies suggest that participating in the arts may be a powerful promoting factor for positive mental health, regardless of level of privilege and wealth (Hymon, 2020). Given the myriad potential benefits of participation in the arts and the inconsistency of results related to privilege and the impact of the arts, it is important to investigate whether young adults have similar patterns of inequity in access and whether the relationship between positive mental health and participation in the arts differs by race/ethnicity and income.

Current Study Contribution

Using a large, national dataset of young adults, this study aims to 1) investigate the extent to which positive mental health is predicted by participation in performing arts (music, dance, and

theater) compared to writing and visual arts, and 2) where a relationship is found, investigate the extent to which the relationship between arts and positive mental health is moderated by demographic characteristics (race/ethnicity, income, and gender). The study employs extensive controls for possible confounders and statistical methods to build confidence in a possible causal interpretation of the relationships.

This study contributes to the literature in several ways. It will be one of the first studies to investigate potential drivers of positive mental health for young adults and to specifically examine the relationship between arts participation and positive mental health for young adults. This study also provides novel insights about equity in access to the arts and whether there are stronger relationships between positive mental health and arts participation for some demographic groups compared to others.

METHODS

Study Population

The individuals in this study are young adults (18 to 28 years old) who are part of the Millennial generation (defined as those born between 1981 to 1996) (Dimock, 2019). (See Chapter 2 for an extensive discussion about the Millennial population.) Variables related to traditional role transitions for young adults are included in this study to account for their potential association with positive mental health.

Data

The data for this study is from the Panel Study of Income Dynamics (PSID), the longest running, nationally representative, longitudinal family study in the US, which begun in 1968 with 18,000 individuals in 5,000 families and continued almost every year since. The original sample

included an oversampling of low-income families, and in 1997, a supplemental immigrant sample was added in order to better represent the changing demographics of the US. The PSID includes a wealth of information about income, health, family dynamics, education, and employment, among other topics. Over four waves (1997, 2002, 2007, and 2014), the Child Development Supplement surveyed a representative sample of children and adolescence (either directly or through parent surveys depending on child age) within the PSID about topics like child behavior, school achievement, physical and mental health, home environment, and parenting styles.

When individuals in the Child Development Supplement turned 18, they were added to a new study called the Transition to Adulthood Supplement. The Transition to Adulthood Supplement began in 2005 to capture the period between childhood and full adulthood. Survey waves occurred every two years from 2005 to 2017. From 2005 to 2015, the sample included any individual who had previously been part of the Child Development Supplement sample. In 2017, all young adults from 18-28 in the PSID sample were included. Appendix 2-B shows the Transition to Adulthood Supplement sample by wave and age of individual. Note that this sample does not have the same proportion of individuals of each age in each wave – there is a rolling inclusion structure of individuals based on when they age out of the Child Development Supplement sample. Appendix 2-A shows the response rates for the Transition to Adulthood Supplement, which ranges from 87 percent to 92 percent.

Sample

For this study, individuals are included who have at least three waves of Transition to Adulthood Supplement data, have an observation for the main dependent variable (positive mental health) for each wave used and are between 18 and 28 years of age. This excludes 397 observations for individuals at 17 years old and 1048 individuals with fewer than three waves. For individuals with

more than three waves of data, the study uses their first three waves. This sample includes 1,756 individuals and 5,268 person-years.

Measures

The main dependent variable for this study is the Keyes Mental Health Continuum-Short Form (MHC-SF) for Positive Mental Health. There are 14 items ranging from 0 (none of the time) to 5 (all of the time) for a total range of 0-70 for the 'continuous' scale used in this analysis. A full description of items, distribution, validity, and reliability of this scale can be found in Chapter 2, Appendix 2-A. The three subscales of positive mental health, emotional, social, and psychological wellbeing, are also included as dependent variables in separate models to better understand which components of positive mental health may drive any associations found.

The main predictor is arts participation, which includes the categories 1) performing arts (music, dance, and theater) and 2) visual arts and writing. The hypothesized causal pathways discussed above may work differently for different art forms. Music, dance, and theater are explicitly collective and social, which may activate the causal pathways around social bonding and collective flow, and perhaps also enhance the sense-making and entertainment causal pathways. Writing and visual arts, by contrast, are often done in solitude and so presumably rely on the enriching-experience and aesthetic pathways. For this reason, the arts are grouped into the two categories, performing arts (music, dance, and theater) and writing and visual arts. Separate analyses are performed for each of the two art types separately. Appendix 5-A shows how each arts code was categorized. Arts participation is measured by frequency: never, less than once a month to at least once a month, once a week to almost every day, and every day.

For all models, covariates include the following:

- age (ranging from 18-28);

- log of total household income;
- education and employment status: in school (regardless of work status), working but not in school, and neither working nor in school;
- residence (during fall and winter): lives with parents, renter, lives in dorm, owns home, and other;
- marital status: single; divorced, separated, or widowed; cohabitating; and married;
- whether the individual has a child (yes/no);
- whether the individual is the head of household (yes/no); and
- whether the individual is considered low-income (less than $20,000 household income) (yes/no).

For fully adjusted models in Aim 1, covariates include:

- Leisure activity types (sports, volunteering, consuming the news, reading, and watching TV) which are also measured by frequency.

For Aim 2, moderators include:

- People of Color vs. White (people of color includes the following race/ethnicities: American Indian or Alaskan Native, Asian, Black or African American, Latinx, Native Hawaiian or Other Pacific Islander, and Other)
- Low income (less than $40,000) vs. Higher Income ($40,000 and above).

These categories are not meant to reflect something inherently different between groups, but rather to act as a crude proxy for privilege and access based on structural inequities.

The descriptive table includes tabulations of sex and race/ethnicity along with the variables included in all models. Race/ethnicity and sex are not included in the fixed effects models because

they do not change during the study time period for anyone in the sample and would thus drop out of the model. The race/ethnicity variable and categories in this study are limited due to data collection methods and sample-size limitations. The descriptive table includes Black, Latinx, white and other as categories. The other category includes Asian, American Indian or Alaskan Native, and Native Hawaiian and other Pacific Islander.

Analysis Plan

Models for Aim 1 use least squares linear regression and individual-level fixed-effects linear regression models to investigate how changes in arts participation over time are associated with changes in positive mental health over time, controlling for potential confounders. For the fixed effects design, only time-varying covariates can be included. An individual-level fixed effects model removes any variation that occurs between individuals, instead modeling only the variation *within* an individual across observations (over time) (Angrist & Pischke, 2008). Thus, in the fixed effects model, the coefficient on performing arts is only based on variation across time for an individual in the frequency of performing arts participation and its relationship to variation across time in that individual's positive mental health, controlling for time-varying covariates. Those individuals whose frequency of arts participation does not change across the three waves of study data would not meaningfully contribute to the coefficient of arts participation on positive mental health in the fixed effects models. The fixed effects model was chosen to leverage the longitudinal data structure in order to minimize unobserved, time-invariant confounders of the relationship between arts participation and positive mental health.

In a second series of models for Aim 1, the relationship between performing arts and positive mental health is further investigated. Fixed effects models for positive mental health and each of its subscales (emotional, social, and psychological wellbeing) are shown with performing arts

frequency as the main predictor, with and without other leisure time activity frequencies added to test whether their inclusion would lead to an attenuation of the coefficient on performing arts.

Aim 2 includes two sections. First, tabulations of performance art participation by subgroups (people of color vs. whites, low-income vs. higher income, and female vs. male) are presented with chi-square tests to detect any significant differences between groups. Then, a Hausman test was conducted to examine whether a random effects model would be consistent in order to run a fully interacted model by subgroup and performing arts participation. However, the Hausman test indicated that a random effects model would not be consistent, so a fixed effects models is more appropriate. Thus, stratified analyses are conducted by subgroup with individual-level fixed effects, adjusting for covariates to investigate potential differences in the relationship between performing arts and demographic characteristics with positive mental health.

Though sample weights are available for the PSID Transition to Adulthood Supplement, they were not used in main analyses for this study. Sensitivity analyses tested whether there were substantive differences of coefficients of interest between weighted and unweighted models. Weighted models had slightly attenuated coefficients compared to non-weighted models but did not differ substantively. It is preferable, statistically, to omit weighting in this scenario (Winship & Radbill, 1994). One of the main characteristics adjusted for using the weights is race/ethnicity due to the oversampling of low-income individuals in the original sample. If there were substantive differences, the stratified analyses would account for the racial/ethnic adjustments (Dumouchel & Duncan, 1983). This study stratifies models for Aim 2 based on both income and race/ethnicity, addressing the issue of weighting.

Estimates of variance in the models are adjusted to account for clustering at the family level using a Huber White Sandwich Estimator since some siblings are included in the sample. All

outcome variables were transformed into z-scores with a mean of 0 and a standard deviation of 1, so that coefficients are interpreted as effect sizes. All analyses were conducted in STATA 14.2.

Sensitivity Analyses

The seven frequency categories of arts participation in the original survey were lumped together to create only four categories in this study (none, less than once a month to more than once a month, once a week to almost every day, and every day). Another option was tested with three categories of arts participation instead of four (none to more than once a month, once a week to almost every day, and every day). Additionally, as noted above, the main analyses for Aim 1 were conducted with survey weights in a sensitivity analysis.

RESULTS

Descriptive Results

A description of the PSID Transition to Adulthood sample can be found in Table 5-1. Around 12 percent of the sample indicate any participation in the performing arts and only about 4.5 percent of the sample indicate any participation in visual arts and writing. Most observations are in the younger age categories (18-19, 20-21, and 22-23). There is a disproportionate number of Black individuals in the sample (41.37%), attributable to the oversampling of low-income individuals in the original 1968 sample. As would be expected for young adults, the vast majority are single, without children, and either living with parents or renting. 17.5 percent of the sample are neither employed nor in school.

Table 5-1: Description of PSID Transition to Adulthood Sample (unweighted)
N=5,628 Person-Years, 1,756 Individuals

	Never	Less than once a month to once a month	Once a week to almost every day	Every day

Any Arts Participation – N (%)	4,401 (83.5)	243 (4.6)	530 (10.1)	94 (1.8)	
Performing Arts	4,636 (88.0)	163 (3.1)	390 (7.4)	79 (1.5)	
Visual Arts and Writing	5,033 (95.5)	80 (1.5)	140 (2.7)	15 (0.3)	
Age Category	**18-19**	**20-21**	**22-23**	**24-25**	**26-28**
N (%)	1,356 (25.7)	1,592 (30.2)	1,573 (29.9)	610 (11.6)	137 (2.6)
Race/ethnicity	**White**	**Black**	**Hispanic**	**Other**	
N (%)	2,391 (45.4)	2,195 (41.7)	565 (10.7)	117 (2.2)	
Sex	**Male**	**Female**			
N (%)	2,514 (47.7)	2,754 (52.3)			
Education/Employment Status	**Employed, not student**	**Student**	**Unemployed, not student**		
N (%)	2,218 (42.1)	2,130 (40.43)	920 (17.5)		
Residence	**Parent's home**	**Rent**	**Dorm**	**Own**	**Other**
N (%)	2,466 (46.8)	1,680 (31.9)	563 (10.7)	319 (6.1)	240 (4.6)
Marital Status	**Single**	**Divorced/Separated/ Widowed**	**Cohabitating**	**Married**	
N (%)	4,018 (76.3)	83 (1.6)	775 (14.7)	392 (7.4)	
Have a child	**No**	**Yes**			
N (%)	4,103 (77.9)	1,165 (22.1)			
Low Income (<$40,000)	**No**	**Yes**			
N (%)	4,212 (79.9)	1,056 (20.1)			
Head of Household	**No**	**Yes**			
N (%)	3,527 (66.9)	1,741 (33.1)			

	Mean	**SD**	**Min**	**Max**
Annual Household Income	$72,187	$95,537	$0	$2,133,500
Positive Mental Health	48.9	11.5	0	70

Arts Participation by Category

Table 5-2 includes least squares and individual-level fixed effects linear regression models for the relationship between positive mental health and each of the arts categories (performing arts, and visual arts and writing). Columns 1 and 2 show the performing arts participation as the outcome variable in least squares and fixed effects models, respectively. Covariate estimates are omitted from the table for ease of interpretation. Compared to no participation, once a week to almost every day-participation is associated with an increase in effect size in positive mental health of 0.186 ($p=0.002$) in the least squares and 0.111 ($p=0.029$) in the fixed effects models, respectively. Everyday participation is associated with an effect size increase of 0.420 ($p<0.001$) in the least squares and

0.394 ($p<0.001$) in the fixed effects models, respectively, all else equal. Columns 3 and 4 show that there are no significant increases in positive mental health for increased frequency of visual arts and writing participation at the $p<0.05$ level for either the least squares or fixed effects models. Figure 5-1 shows the main effects of interest from Table 5-2.

Table 5-2: Least Squares and Individual-Level Fixed Effects Linear Regression Models for Performing Arts and Visual Arts and Writing on Positive Mental Health – PSID Transition to Adulthood Sample (Unweighted)

	Performing Arts		**Visual Arts and Writing**	
	1	**2**	**3**	**4**
	Least Squares	**Fixed Effects**	**Least Squares**	**Fixed Effects**
	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)
Arts Frequency (Ref Group = None)				
Less than once a month to at least once a month	0.065 (0.440)	-0.013 (0.851)	0.011 (0.913)	0.044 (0.653)
Once a week to almost every day	**0.186**** **(0.002)**	**0.111*** **(0.029)**	-0.057 (0.486)	0.063 (0.379)
Every day	**0.420***** **(<0.001)**	**0.394***** **(<0.001)**	0.162 (0.595)	-0.266 (0.340)
Age	**0.023**** **(0.005)**	**0.017*** **(0.021)**	**0.020*** **(0.011)**	**0.015*** **(0.043)**
Log of Total Income	0.006 (0.696)	-0.025 (0.146)	0.008 (0.614)	-0.024 (0.170)
Race/Ethnicity (Ref Group = Black)				
White	**-0.151**** **(0.001)**		**-0.148**** **(0.001)**	
Latinx	**-0.218**** **(0.003)**		**-0.223**** **(0.002)**	
Other	-0.255 (0.116)		-0.241 (0.140)	
Sex (Ref Group = Male)	0.058 (0.135)		0.055 (0.161)	
Constant	**-0.550*** **(0.025)**	-0.143 (0.548)	**-0.501*** **(0.041)**	-0.100 (0.672)

Robust p-values in parentheses
*** $p<0.001$, ** $p<0.01$, * $p<0.05$
N=5268 Person-years
Covariate estimates omitted from table
Coefficients presented as effect sizes

Figure 5-1: Main Coefficients for Least Squares and Fixed Effects Linear Regressions for Performing Arts and Visual Arts and Writing on Positive Mental Health

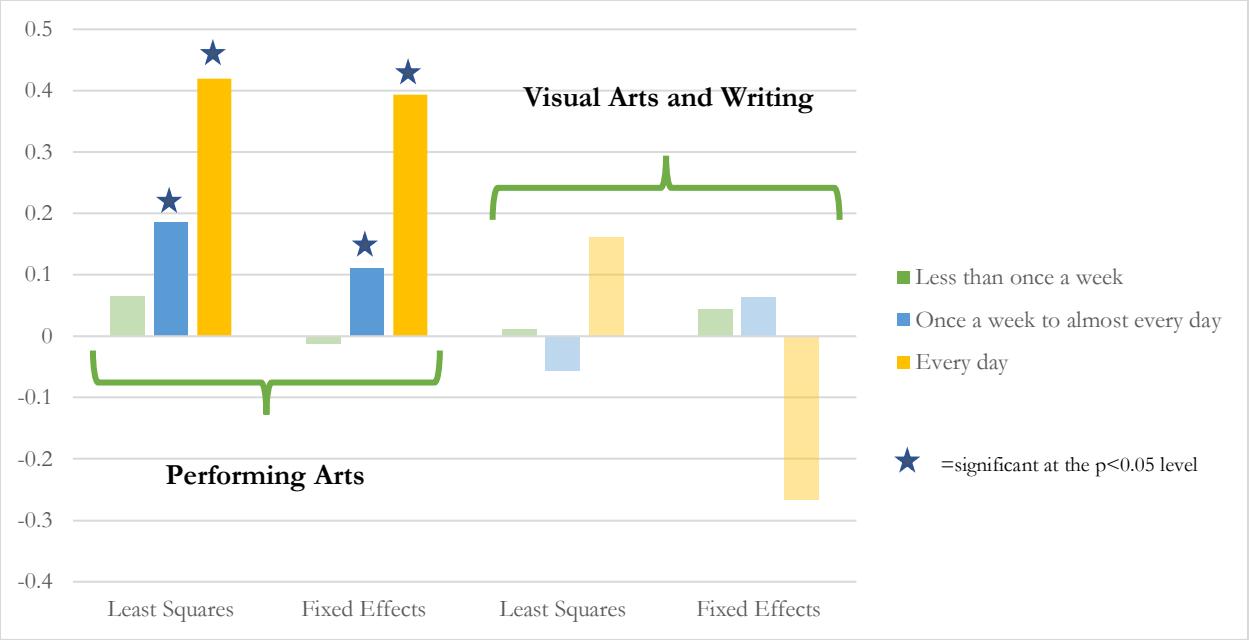


Table 5-3 presents the individual-level fixed effects models for the relationship between positive mental health, its subscales, and performing arts participation. In secondary columns, frequency of non-arts-related leisure activities are included to test whether results are attenuated due to their inclusion. Across all outcomes, the inclusion of non-arts leisure activities does not substantively impact the results for main outcomes. Columns 1 and 2 present results for overall positive mental health. Compared to no participation, everyday participation is associated with an increase in effect size of 0.394 ($p<0.001$) without leisure activities included and 0.382 ($p<0.001$) with leisure activities included, all else equal. Columns 3 and 4 show results for emotional wellbeing. No frequency of performing arts participation is associated with higher emotional wellbeing. Columns 5 and 6 show results for social wellbeing. Effect sizes are similar in magnitude compared to positive mental health, and the effect sizes for once a week to almost everyday frequency and everyday frequency are actually slightly larger when leisure activities are included (0.148 [$p=0.001$] compared to 0.157 [$p=0.002$] and 0.329 [$p=0.001$] compared to 0.438 [$p<0.001$] respectively). Volunteering, consuming the news, and reading at high frequencies are associated with higher levels of positive mental health as well.

Table 5-3: Individual-Level Fixed Effects Linear Regression Models for Performing Arts on Positive Mental Health, including Non-Arts Leisure Activities – PSID Transition to Adulthood Sample (Unweighted)

	Positive Mental Health		Emotional Wellbeing		Social Wellbeing		Psychological Wellbeing	
	1	2	3	4	5	6	7	8
	Base Model	Fully Adjusted	Base Model	Fully Adjusted	Base Model	Fully Adjusted	Base Model	Fully Adjusted
	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)
Arts Frequency (Ref Group = None)								
Less than once a month to at least once a month	-0.013	-0.011	-0.024	-0.015	0.025	0.030	-0.054	-0.051
	(0.851)	(0.875)	(0.752)	(0.839)	(0.654)	(0.670)	(0.452)	(0.468)
Once a week to almost every day	**0.111***	**0.116***	0.065	0.069	**0.148****	**0.157****	0.040	0.043
	(0.029)	**(0.023)**	(0.226)	(0.201)	**(0.001)**	**(0.002)**	(0.451)	(0.428)
Every day	**0.394*****	**0.382*****	0.121	0.112	**0.329*****	**0.438*****	**0.302*****	**0.293*****
	(<0.001)	**(<0.001)**	(0.134)	(0.171)	**(0.001)**	**(<0.001)**	**(<0.001)**	**(<0.001)**
Sports Frequency (Ref Group = None)								
Less than once a month to at least once a month		0.154		0.113		0.140		0.125
		(0.101)		(0.286)		(0.148)		(0.149)
Once a week to almost every day		-0.029		-0.018		-0.040		-0.009
		(0.436)		(0.673)		(0.318)		(0.834)
Every day		-0.041		0.015		0.023		-0.128
		(0.573)		(0.851)		(0.754)		(0.089)
Volunteering Frequency (Ref Group = None)								
Less than once a month to at least once a month		**-0.178***		**-0.329*****		-0.049		**-0.174***
		(0.024)		**(<0.001)**		(0.539)		**(0.040)**
Once a week to almost every day		-0.019		0.034		-0.036		-0.018
		(0.851)		(0.739)		(0.731)		(0.865)
Every day		**0.422*****		**0.465***		**0.426*****		0.215
		(<0.001)		**(0.019)**		**(<0.001)**		(0.133)

News frequency (Ref Group = Less than once a month								
Once a week to almost every day		**0.101***		0.035		**0.123****		0.066
		(0.010)		(0.420)		**(0.002)**		(0.126)
Every day		**0.146****		0.084		**0.113***		**0.155****
		(0.006)		(0.149)		**(0.050)**		**(0.005)**
Reading frequency (Ref Group = Less than once a month								
Once a week to almost every day		**0.126*****		**0.123*****		**0.092****		**0.113*****
		(<0.001)		**(<0.001)**		**(0.004)**		**(<0.001)**
Every day		**0.178*****		**0.125***		**0.126***		**0.190*****
		(<0.001)		**(0.025)**		(0.024)		**(<0.001)**
TV frequency (Ref Group = Less than once a month								
Once a week to almost every day		-0.037		-0.054		-0.036		-0.014
		(0.540)		(0.400)		(0.550)		(0.826)
Every day		0.033		0.036		0.050		-0.002
		(0.616)		(0.611)		(0.455)		(0.971)
Constant	-0.143	-0.263	-0.078	-0.151	-0.382	**-0.527***	0.164	0.101
	(0.548)	(0.276)	(0.765)	(0.571)	(0.098)	**(0.022)**	(0.514)	(0.702)

Robust p-values in parentheses
*** p<0.001, ** p<0.01, * p<0.05
Covariate estimates omitted from table

Stratified Analyses by Income and Race/Ethnicity

Table 5-4 shows performing arts participation by race/ethnicity (people of color vs. white), income (<$40,000 vs >$40,000), and gender (female vs. male). Higher-income individuals are more likely to participate in performing arts than low-income individuals and whites are more likely to participate than people of color ($p<0.001$). Specifically, 3.3 percent more white individuals participate in performing arts than people of color and 7.3 percent more high-income individuals participate in performing arts than low-income individuals. There are no significant differences between genders.

Table 5-4: Tabulations of Performing Arts Participation by Select Subgroups (Race/ethnicity, Income, and Gender) (Unweighted)

N (%)	**Never**	**Less than once a month to once a month**	**Once a week to almost every day**	**Every day**
People of Color***	2,576 (89.5)	88 (3.1)	180 (6.3)	33 (1.2)
White	2,060 (86.2)	75 (3.1)	210 (8.8)	46 (1.9)
Low income***	2,034 (92.2)	56 (2.5)	103 (4.7)	13 (0.6)
Higher income	2,602 (84.9)	107 (3.5)	287 (9.4)	66 (2.2)
Female	2,440 (88.6)	83 (3.0)	201 (7.3)	30 (1.1)
Male	2,196 (87.4)	80 (3.2)	189 (7.5)	49 (1.9)

NOTE: ***Differences between groups significant at the $p<0.001$ level using a chi-square test.

Tables 5-5 through 5-8 present the results for stratified analyses by race/ethnicity, income, and gender for positive mental health and each of its subscales. Table 5-5 presents results for the full positive mental health scale. The effect size for everyday performing arts participation is 0.295 for the white group ($p=0.007$) compared to 0.436 ($p<0.001$) for people of color, 0.398 for high income individuals ($p<0.001$) compared to 0.326 for low-income individuals ($p=0.110$) and 0.419 ($p<0.001$) for males compared to 0.379 ($p<0.001$) for females. The only coefficient not significant at the

p<0.05 level is for the low-income group. Table 5-6 presents results for emotional wellbeing. Similar to previous findings, there are no significant results for emotional wellbeing for any subgroup. Table 5-7 presents social wellbeing results. Similar to positive mental health, the effect size for people of color is slightly higher than that of white individuals, the effect size for low-income individuals is not quite significant at the p<0.05 level but similar in magnitude to that of the high-income individuals, and male and female effect sizes are quite similar. Table 5-8 presents psychological wellbeing findings. The effect size for people of color is slightly lower than that of white individuals, and the effect size for low-income individuals is smaller in magnitude and not at all statistically significant. The effect size for females is lower than that of males.

Table 5-5: Stratified Analyses of Performing Arts Participation on Positive Mental Health by Race/Ethnicity, Income, and Gender using Individual-Level Fixed Effects (Unweighted)

	1	2	3	4	5	6
	White	**POC**	**High Income**	**Low Income**	**Male**	**Female**
	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)
Arts Frequency (Ref Group = None)						
Less than once a month to at least once a month	-0.128	0.068	0.020	-0.048	-0.048	0.035
	(0.187)	(0.487)	(0.823)	(0.765)	(0.603)	(0.718)
Once a week to almost every day	0.102	0.092	**0.128***	-0.050	0.158	0.078
	(0.117)	(0.241)	**(0.040)**	(0.675)	(0.053)	(0.214)
Every day	**0.295****	**0.436*****	**0.398*****	0.326	**0.419*****	**0.379*****
	(0.007)	**(<0.001)**	**(<0.001)**	(0.110)	**(<0.001)**	**(<0.001)**
Constant	-0.344	-0.208	0.674	-0.557	-0.250	-0.179
	(0.315)	(0.444)	(0.240)	(0.082)	(0.419)	(0.522)
Observations	2,391	2,877	3,062	2,206	2,514	2,754
Number of Individuals	823	990	1,350	1,085	838	918

Robust p-values in parentheses
*** p<0.001, ** p<0.01, * p<0.05

Table 5-6: Stratified Analyses of Performing Arts Participation on Emotional Wellbeing by Race/Ethnicity, Income, and Gender using Individual-Level Fixed Effects (Unweighted)

	1	2	3	4	5	6
	White	**POC**	**High Income**	**Low Income**	**Male**	**Female**
	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)

Arts Frequency (Ref Group = None)						
Less than once a month to at least once a month	0.007	-0.049	0.071	-0.192	-0.031	-0.020
	(0.944)	(0.674)	(0.451)	(0.281)	(0.782)	(0.845)
Once a week to almost every day	0.053	0.068	0.060	-0.073	0.136	0.015
	(0.463)	(0.400)	(0.363)	(0.576)	(0.132)	(0.816)
Every day	0.053	0.167	0.045	0.286	0.142	0.096
	(0.650)	(0.156)	(0.642)	(0.233)	(0.228)	(0.416)
Constant	-0.006	-0.079	0.179	-0.235	0.001	-0.038
	(0.987)	(0.803)	(0.765)	(0.545)	(0.998)	(0.900)
Observations	2,391	2,877	3,062	2,206	2,514	2,754
Number of individuals	823	990	1,350	1,085	838	918

Robust p-values in parentheses
*** p<0.001, ** p<0.01, * p<0.05

Table 5-7: Stratified Analyses of Performing Arts Participation on Social Wellbeing by Race/Ethnicity, Income, and Gender using Individual-Level Fixed Effects (Unweighted)

	1	**2**	**3**	**4**	**5**	**6**
	White	**POC**	**High Income**	**Low Income**	**Male**	**Female**
	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)
Arts Frequency (Ref Group = None)						
Less than once a month to at least once a month	-0.093	0.120	0.057	0.015	-0.009	0.082
	(0.335)	(0.236)	(0.513)	(0.931)	(0.925)	(0.415)
Once a week to almost every day	0.116	0.158	**0.159***	0.122	0.141	**0.173***
	(0.078)	(0.051)	**(0.013)**	(0.271)	(0.069)	**(0.013)**
Every day	**0.312***	**0.546*****	**0.454*****	0.462	**0.432****	**0.475****
	(0.027)	**(0.000)**	**(0.000)**	(0.066)	**(0.002)**	**(0.001)**
Constant	-0.479	-0.504	0.757	-1.042**	-0.569	-0.400
	(0.171)	(0.069)	(0.216)	(0.002)	(0.055)	(0.167)
Observations	2,391	2,877	3,062	2,206	2,514	2,754
Number of individuals	823	990	1,350	1,085	838	918

Robust p-values in parentheses
*** p<0.001, ** p<0.01, * p<0.05

Table 5-8: Stratified Analyses of Performing Arts Participation on Psychological Wellbeing by Race/Ethnicity, Income, and Gender using Individual-Level Fixed Effects (Unweighted)

	1	**2**	**3**	**4**	**5**	**6**
	White	**POC**	**High Income**	**Low Income**	**Male**	**Female**
	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)
Arts Frequency (Ref Group = None)						
Less than once a month to at least once a month	-0.185	0.038	-0.059	-0.026	-0.084	-0.007
	(0.081)	(0.691)	(0.537)	(0.865)	(0.389)	(0.947)

Once a week to almost every day	0.068	-0.013	0.072	-0.220	0.122	-0.034
	(0.361)	(0.865)	(0.267)	(0.070)	(0.160)	(0.576)
Every day	**0.274***	**0.258****	**0.343*****	0.047	**0.369****	**0.251***
	(0.022)	**(0.007)**	**(0.001)**	(0.803)	**(0.001)**	**(0.023)**
Constant	-0.214	0.162	0.543	0.084	0.102	0.083
	(0.569)	(0.549)	(0.356)	(0.795)	(0.757)	(0.780)
Observations	2,391	2,877	3,062	2,206	2,514	2,754
Number of individuals	823	990	1,350	1,085	838	918

Robust p-values in parentheses
*** p<0.001, ** p<0.01, * p<0.05

Sensitivity Analyses

Alternative models for main outcomes were tested with an alternative coding for frequency of time spent in arts participation. There were no significant differences between coefficients in the models (models not shown here). Appendix 5-B shows main models for performing arts and visual arts and writing with survey weights. The effect sizes are slightly attenuated, potentially due to the down-weighting of Black individuals due to the oversampling of Black individuals in the original sample. Thus, stratified analyses are best suited for this analysis.

DISCUSSION

This study provides novel evidence that frequent participation in performing arts may contribute to higher levels of positive mental health. The results show that, compared to no participation, an increase to weekly or almost everyday participation in performing arts is associated with an increased effect size in positive mental health of about 0.1. Compared to no participation, an increase to everyday participation in performing arts is associated with an increased effect size in positive mental health of about 0.4. General guidance around effect sizes suggests that a 0.1 effect size is fairly small, but 0.4 is medium-sized effect (J. Cohen, 2013). These results are robust to the inclusion of individual-level fixed effects as well as the inclusion of frequency of non-arts leisure activities. These leisure activities were included to test the hypothesis that the association found between performing arts and positive mental health is actually driven by an unobserved variable,

such that any leisure activity may lead to the same contribution in positive mental health. However, the effect size of performing arts on positive mental health and its subscales did not decrease, and in some instances, slightly increased, with the inclusion of other leisure activities. Many of these leisure activities (volunteering, reading, and watching the news) have unique and additional associations with positive mental health The results of this study are consistent with a study that highly scheduled time use during adolescence is related to increased positive mental health in young adulthood (Mahoney & Vest, 2012).

This is the first study, to my knowledge, to investigate the relationship between arts participation and positive mental health for young adults. The few studies that have investigated the relationship between different types of arts participation and positive mental health in other populations yield similar findings (Conner et al., 2018; Hymon, 2020; Tymoszuk et al., 2019). This study somewhat contradicts the findings of Foster and Marcus Jenkins (2017) which suggests that the relationship between wellbeing and arts participation may, in fact, be driven by access and privilege rather than a direct relationship. By using individual-level fixed effects, the models in this study account for time-invariant, individual-level differences such as parental education, and stratified analyses show that, compared to white individuals, people of color have similar, if not larger, effect sizes for performing arts. Yet, consistent with Foster and Marcus Jenkins (2017), stratified analyses suggest that associations between performing arts and positive mental health are not significant for low income individuals. This may also be due to limited data for low-income individuals who participate frequently in performing arts (only 13 observations in the highest frequency).

The findings here offer insights into the potential causal pathways through which arts participation may improve well-being. The finding that only participation in performing arts (and not participation in writing or visual arts) is associated with positive mental health may suggest that

the pathway from arts to well-being operate through social bonding and collective flow rather than primarily through aesthetic appreciation or enriching experiences. It could also be that the communal nature of music and theater is effective through some other pathway. In the analyses of positive mental health subscales, emotional wellbeing was not found to be associated with performing arts, whereas social and psychological wellbeing were. The strong relationship between social and psychological wellbeing and performing arts lends further evidence to the hypothesis that collective flow and social bonding may be potential mechanisms for the relationship between positive mental health and performing arts. This will be an area of fruitful research in the future.

This article also contributes to our understanding of equity in arts participation and positive mental health. Consistent with previous studies, this study shows that low-income individuals and people of color are less likely to participate in performing arts than their high-income or white peers (Elpus, 2014; Gallagher et al., 2008; Parsad & Spiegelman, 2012; Rabkin & Hedberg, 2011). However, when they do participate, people of color have similar or potentially higher rates of positive mental health compared to white individuals who participate in performing arts. This suggests the importance of increasing access and opportunity to participating in arts for historically disadvantaged communities. The findings regarding differences between low-income and high-income individuals are confusing. These results suggest a significant relationship for high-income individuals but not for low-income individuals. More research is needed to understand this phenomenon.

This research suggests that regular participation in arts education may be important. Infrequent participation (less than once a week) is not associated with the benefits of more frequent participation, and daily participation is associated with the highest rates of positive mental health. This is consistent with previous findings of a dose-response for arts participation (Tymoszuk et al., 2019).

Overall, this study makes several novel contributions to the literature. The study provides new insights into potential predictors of positive mental health, suggesting that performing arts as well as non-arts leisure activities are strong predictors of positive mental health. As a critical developmental period, young adulthood is an important time for support and mental health promotion, and this study offers novel evidence about wellbeing for young adults. This study also provides further evidence of the inequities of arts access for low-income young adults and people of color in young adulthood and suggests that the relationship between positive mental health and performing arts is at least as strong for people of color as it is for white individuals.

Limitations

This study has several limitations. First, the sampling patterns present analytic challenges: individuals enter the sample in different years and at different ages and thus have different numbers of total observations. To address this issue, the sample was constrained to exactly three observations per individual and a fixed effects model was employed. Second, all variables are based on self-report, which could result in recall bias. Third, this study cannot be considered fully causal since it is not experimental and does not have a control group. Though the fixed effects model can account for time-invariant, individual-level differences, it cannot account for unobserved confounders that change over time within an individual or address potential reverse causality (that individuals who experience an increase in positive mental health subsequently participate in more performing arts). However, several features of the study suggest that a causal interpretation is plausible. First of all, the Bradford Hill criteria are all met: the magnitude of the coefficients are meaningful, the results are consistent across different individuals in this large, nationally representative dataset, the results remain significant when more specific variables are used for arts participation, the dataset is

longitudinal, and there is a dose-response based on frequency of participation (Hill, 1965). There are also extensive controls in the model.

Future Research and Policy Recommendations

The findings of this article support an increased investment in the arts for the sake of mental health in young adults. Young adulthood is a delicate time for mental health since there are so many large life transitions and most mental illnesses manifest by young adulthood (Patel et al., 2007; Paus et al., 2008; Woodberry et al., 2016). Young adults who participate regularly in performance arts have considerably higher levels of positive mental health, which is associated with many health and life benefits (Gilmour, 2015; Keyes & Grzywacz, 2005; Keyes & Simoes, 2012; Lamers, Bolier, et al., 2012; Schotanus-Dijkstra et al., 2017; Suldo & Shaffer, 2008).

However, there is also a justification for increased access to the arts just for 'art's sake'. Scholars have long praised the importance of art for the development of humanity, the spread of ideas and the sophistication of our thoughts (Lomas, 2016b). In this sense, arts participation is an end in itself and not simply the means to some other end. This distinction has important equity implications. Art for art's sake is often justified as a worthy investment in wealthy communities, whereas in low-income communities and communities of color, it seems that these investments need to be justified by some other outcome like academic achievement or decreased crime or teen pregnancy rates (Lomas, 2016b). While these are valuable ends, it is also important to recognize that allowing for the full dignity of young adults from low-income or disadvantaged communities requires equitable access to the same inherent goods as young adults from more privileged communities.

These results also suggest that there are rich scientific insights and policy implications that could come from better data on both positive mental health and arts participation. Very few

administrative and other secondary datasets include these topics. The PSID seems to be the only large, national dataset that includes both positive mental health and arts participation.

CONCLUSION

This is one of the first studies to investigate whether increased participation in performing arts is associated with higher levels of positive mental health. These results suggest that, while young adults from privileged backgrounds are more likely to participate in performing arts, participation in performing arts is meaningfully linked with positive mental health, regardless of race/ethnicity. Young adulthood is now considered an extended adolescence and an important stage of development (Bonnie et al., 2014). This study lends support for a continued investigation into what may contribute to wellbeing in young adulthood and for increased access to performing arts for young adults from diverse backgrounds.

Appendix 5-A: Categorization of Arts Codes from PSID Transition to Adulthood Supplement

Music	Dance	Theater	Visual Arts	Writing
• Band/orchestra – after school • Playing a musical instrument (including practicing), whistling • Singing for fun, karaoke, special event, or competition • Music lessons, unspecified • Voice lessons • Lessons in musical instruments	• Non-social dancing; ballet, modern dance, body movement • Lessons in dance	• Drama/art club – after school • Acting in/rehearsing for a play	• Needlework, including classes (knitting, crocheting, beading, embroidery) • Arts, arts and crafts, arts unspecified • Pottery, ceramics • Painting • Drawing, coloring • Sculpture	• Literature, literature unspecified • Writing (not letters; not homework) • Poetry • Writing in a diary • Other activities

Appendix 5-B: Least Squares and Fixed Effects Models with Survey Weights for Performing Arts and Visual Arts and Writing on Positive Mental Health – PSID Transition to Adulthood Sample

	Performing Arts		Visual Arts and Writing	
	1	2	3	4
	Least Squares	**Fixed Effects**	**Least Squares**	**Fixed Effects**
	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)	Effect Size (p-value)
Arts Frequency (Ref Group = None)				
Less than once a month to at least once a month	0.129	-0.047	0.093	0.198
	(0.157)	(0.537)	(0.451)	(0.093)
Once a week to almost every day	0.087	0.027	-0.047	0.013
	(0.153)	(0.681)	(0.648)	(0.879)
Every day	**0.381*** **	**0.298** **	0.221	-0.040
	(0.000)	**(0.003)**	(0.517)	(0.895)
Age	0.016	0.003	0.014	0.002
	(0.084)	(0.756)	(0.143)	(0.867)
Log of Total Income	**0.068*** **	0.016	**0.069*** **	0.018
	(0.001)	(0.513)	**(0.001)**	(0.472)
Race/Ethnicity (Ref Group = Black)				
White	**-0.208*** **		**-0.205*** **	
	(0.000)		**(0.000)**	
Latinx	**-0.308*** **		**-0.311*** **	
	(0.000)		**(0.000)**	
Other	**-0.490*** **		**-0.480*** **	
	(0.000)		**(0.000)**	
Sex (Ref Group = Male)	**0.079***		**0.075***	
	(0.022)		**(0.029)**	
Constant	**-1.024*** **	-0.321	**-0.963** **	-0.307
	(0.001)	(0.329)	**(0.001)**	(0.349)
Observations	5,268	5,268	5,268	5,268
Number of Individuals		1,756		1,756

Robust p-values in parentheses
*** p<0.001, ** p<0.01, * p<0.05
Covariate estimates omitted from table
Coefficients presented as effect sizes

Chapter 6: Conclusion

"The precise role of the artist, then, is to illuminate the darkness, blaze roads through the vast forest, so that we will not, in all our doing, lose sight of its purpose, which is after all, to make the world a more human dwelling place," (Baldwin, 1985).

This dissertation presents an examination of positive mental health and arts participation for Millennials through their adolescence and early adulthood. Chapters 2, 3 and 5 use the Population Study of Income Dynamics (PSID) Transition to Adulthood Supplement. Chapter 2 investigates the potential relationship between major role transitions during early adulthood and positive mental health. Major role transitions traditionally associated with young adulthood include leaving the family home, attending higher education, starting a career, finding a romantic partner, and having children. These role transitions have been theorized to contribute to happiness, and previous studies have found some evidence of associations between these role transitions and emotional and psychological wellbeing in young adults. In preliminary models using least squares linear regressions, this study also finds modest evidence of these associations. However, when employing individual-level fixed effects, which account for time-invariant individual-level confounders, only a few associations remain. Specifically, students have higher positive mental health, and emotional, social, and psychological wellbeing, and lower distress than the weighted average and unemployed individuals have lower positive mental health than the weighted average. Additionally, single individuals have slightly lower emotional wellbeing and cohabitating individuals have slightly higher emotional and psychological wellbeing than the weighted average, and divorced individuals have lower levels of overall positive mental health.

As younger generations continue to redefine the transition from adolescence to adulthood, more research is needed on what younger individuals' value and prioritize as they grow. Additionally, more research is needed on the potential drivers of positive mental health in general for young adults.

Chapter 3 describes trends in positive mental health over time and by income for different racial/ethnic groups. Previous studies have consistently found that Black adults have lower levels of mental illness and higher levels of mental health than white adults. This study contributes to the literature by specifically focusing on young adults and examining 12 years of data over time, by cohort (the year an individual turned 18). While a pooled, cross-sectional analyses would suggest that Black individuals have slightly higher levels of positive mental health than their white and Latinx peers, a time-trend analysis shows that Black individuals in early cohorts have much higher levels of positive mental health, but all three racial/ethnic groups are converging in positive mental health levels in later cohorts. Additionally, white and Latinx individuals have a positive association between positive mental health and household income while Black individuals have a negative association between the two. Future research should investigate the potential drivers of these trends.

Chapter 4 uses the Schools and Staffing Survey (SASS) to investigate trends in arts education availability in public secondary schools by school-level student race/ethnicity and income level, over time from 1994 to 2012 and with the introduction of No Child Left Behind. Using adjusted, logistic regression models, this study finds that schools serving predominantly students of color and low-income students have less access to arts education than wealthier and predominantly white schools. Additionally, using difference-in-difference analyses, the study finds no evidence that NCLB led to a decrease in the availability of arts education, but does find that arts education availability is generally decreasing over time. Data on availability, quality, participation, and equity of arts education is severely lacking, so many important questions cannot yet be answered. Given the evidence that inequities exist and arts education is decreasing over time, it is important to increase the data available to investigate characteristics of arts education and to invest more in ensuring that high quality arts education is available and accessible to all students.

Chapter 5 is, in some ways, a fusion or unification of previous chapters, integrating the study of positive mental health and arts participation. The study employs individual-level fixed effects to investigate the relationship between frequency of performing arts participation and mental health in young adults, as well as issues of equity of access and participation based on race/ethnicity, income, and gender. Results suggest that frequent participation in performing arts is meaningfully associated with higher levels of positive mental health. The relationship is significant for the subscales of social and psychological wellbeing but not for emotional wellbeing. Additional results suggest that high income and white individuals are more likely to participate in performing arts than people of color and lower income individuals. However, when they do participate, people of color have similar levels of positive mental health increases compared to whites.

Chapters 2 and 3 both provide new insights about the state of positive mental health for Millennial young adults. However, much is yet to be understood in terms of the predictors of positive mental health for this population. Chapters 4 and 5 both provide evidence that racial/ethnic and income inequalities persist in access to the arts.

Implications

As the COVID-19 pandemic continues to add turmoil to our already overextended educational system, a focus on issues like positive mental health and access to the arts is ever more important. The policy priority level of arts education is precarious, to say the least. For instance, a prominent institution in the arena of promoting arts access in public schools, the President's Committee on the Arts and Humanities, existed for over 30 years, advocating for strong arts education programs (Dwyer, 2011). However, all members of this committee resigned in protest of President Trump's remarks regarding the white supremacist rally in Charlottesville, Virginia, and President Trump subsequently officially disbanded this committee (Desta, 2017). It is yet to become clear if a similar committee will be reinstated under the new presidential administration.

Students have struggled in many ways under pandemic learning conditions. Though much of the focus has been on students falling behind in academic achievement, another pressing issue is the mental health issues that students may have experienced due to isolation and collective trauma, among other issues. It will be important in the coming months and years, as schools attempt to rebuild and reconfigure, to prioritize issues of positive mental health and activities that may promote wellbeing. The evidence in this dissertation is promising that performing arts may be a promoting factor for mental health.

If nothing else, this dissertation attempts to offer an asset-focused, solutions-oriented lens for mental health for diverse adolescents and young adults. As a former teacher, I often reflect on what I would wish for my students' lives. While I certainly wish them protection against trauma and unmanaged mental illness, I hope for so much more for them. For my students, I hope they feel joy, find a community to which they feel deeply connected, learn to profoundly understand themselves, are able to safely express their true selves to those they care about, and find a sense of purpose in life. In fact, this is my hope for us all.

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