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Childhood Trauma and Psychiatric Disorders as Correlates of School Dropout in a National Sample of Young Adults

Michelle V. Porche, Ed.D.^a, Lisa R. Fortuna, MD, MPH^b, Julia Lin, Ph.D.^c, and Margarita Alegria, Ph.D.^c

^aWellesley Centers for Women, Wellesley College

^bUniversity of Massachusetts Medical School, Department of Psychiatry

^cCenter for Multicultural Mental Health Research, Cambridge Health Alliance/Harvard Medical School

Abstract

The effect of childhood trauma, psychiatric diagnoses, and mental health services on school dropout among U.S. born and immigrant youth is examined using data from the Collaborative Psychiatric Epidemiology Surveys (CPES), a nationally representative probability sample of African Americans, Afro-Caribbeans, Asians, Latinos, and non-Latino Whites, including 2532 young adults, ages 21 to 29. The dropout prevalence rate was 16% overall, with variation by childhood trauma, childhood psychiatric diagnosis, race/ethnicity, and nativity. Childhood substance and conduct disorders mediated the relationship between trauma and school dropout. Likelihood of dropout was decreased for Asians, and increased for African Americans and Latinos, compared to non-Latino Whites as a function of psychiatric disorders and trauma. Timing of U.S. immigration during adolescence increased risk of dropout.

Keywords

DROPOUT; TRAUMA; MENTAL HEALTH; MINORITY YOUTH; IMMIGRATION

Childhood Life Events and Psychiatric Disorders as Correlates of School Dropout in a National Sample of Young Adults

A staggering number of adolescents fail to complete high school despite increased academic resources and attention to school system accountability. The National Center for Education Statistics (NCES; Laird, Kienzl, DeBell, & Chapman, 2007), in its most recent report using nationally representative time-series data, found the overall rate of dropout for youth 16 to 24 was 9.4% with a modest decrease in rates over the past three decades. However, discrepancies and variation in the reporting of dropout status (Kaufman, 2004; Swanson, 2004a) obscures the depth of this educational crisis, with overall estimates running as high as one-third of students dropping out of school, and with increased risk for Black and Latino students (Swanson, 2004b).

Although much attention has been given to family (Jimerson, Egeland, Sroufe, & Carlson, 2000; Orthner & Randolph, 1999) and school factors (Suh, Suh, & Houston, 2007) related to dropout as well as individual factors such as school engagement (Janosz, Archambault, Morizot, & Pagani, 2008), there has been less attention to mental health factors related to school dropout. Some of the school dropout crisis may be explained by experiences of traumatic events (Dyregrov, 2004) or chronic exposure to high stress environments that may lead to or exacerbate psychiatric distress or disorder (Shnurr, Friedman, & Bernardy, 2002).

Examples of trauma include the direct experience or witnessing of physical abuse, sexual abuse and assault, domestic violence, community or school violence including aggressive and threatening peer victimization, severe neglect, traumatic injury, and traumatic loss of a loved one (Cohen, Mannarino, & Deblinger, 2006). Previous examination of early childhood trauma (Broberg, Dyregrov, & Lilled, 2005; Harris, 1983) and psychiatric disorders (Fortin, Marcotte, Potvin, Royer, & Joly, 2006) correlated with risk of dropout has been primarily limited to small nonrepresentative samples. In this study we provide estimates of dropout status in a nationally representative sample of young adults and explore correlates to dropout status using data from Collaborative Psychiatric Epidemiological Surveys (CPES), the most comprehensive psychiatric epidemiological study to date (Heeringa et al., 2004).

Traumatic Stress and Mental Health as Mechanisms to Explain School Failure

Alexander and colleagues (2001) argue that dropping out of school is not an event, but rather a process that begins as early as first grade, influenced by socio-demographics, family stress (e.g., frequent moves, divorce), and parental and personal resources. Throughout this process, many behavioral factors, such as tardiness, absenteeism, fighting (Suh & Suh, 2007), and delinquency and drug use (Newcomb et al., 2002) have been shown to predict school dropout when controlling for academic and demographic correlates. Understanding the influence of these correlates may be strengthened by exploring whether experiences of traumatic events, chronic stress, and psychiatric diagnoses may be related to student outcomes. While the preponderance of research on school dropout focuses on behavioral predictors as primary causes of school failure, in this study we focus on earlier childhood traumatic stress as an exogenous variable which has an indirect effect on school achievement through maladaptive behaviors (Christle, Jolivet, & Nelson, 2007) which reflect psychiatric symptomatology. Research in the behavioral and neurobiological consequences of severe or persistent trauma among youth is a relatively young and burgeoning field, but has much to contribute to our understanding of academic achievement of children and adolescents at risk.

We posit that early traumatic stress affects psychological, social, and physiological development, which disrupts learning and academic achievement. Research in developmental biology and neuroscience has led to a new framework for understanding physical and mental health disparities as a result of early childhood adversity which may have cumulative effects or latent effects if adversity occurs during sensitive periods of development (Shonkoff, Boyce, & McEwen, 2009). These effects of adversity, such as childhood trauma which is characterized as “toxic”, are multi-faceted and can impact various aspects of functioning and development because “it disrupts brain architecture, affects other organ systems, and leads to stress-management systems that establish relatively lower thresholds for responsiveness that persist throughout life, thereby increasing the risk of stress-related disease and cognitive impairment well into the adult years (Shonkoff, Boyce, & McEwen, 2009, p. 2256). Traumatic stress disturbs information processing (van der Kolk & McFarlane, 1996) which can lead to subsequent behavioral and psychiatric consequences (the focus of our analyses) that create barriers to an otherwise successful academic trajectory. These problems with processing include intrusive thoughts, repetition of behaviors related to the trauma which cause harm to others or one’s self, avoidance, hyperarousal, difficulties of attention and distractibility, and disorganization in attachment (van der Kolk & McFarlane, 1996).

While both internalizing and externalizing problems may be experienced as a result of trauma, it is the externalizing behaviors which may be more immediately problematic in a school setting. Early experiences of trauma which can affect children’s ability to modulate physiological arousal and the subsequent loss of self-regulation is related to self-destructive behaviors, conduct problems, and substance abuse (van der Kolk, 1994). Trauma-related

difficulty with self-regulation (Olson, Sameroff, Lunkenheimer, & Kerr, 2009) and attentional processes (Compas & Boyer, 2001) and the trauma-related symptoms of “disorganized or agitated behavior” (American Psychiatric Association, DSM-IV, 1994, p. 428) are often interpreted by teachers as disruptive classroom behaviors. Attempts to numb oneself may also manifest through substance use and abuse (Gutierrez & Van Puymbroeck, 2006; Rodgers et al., 2004) which puts adolescents at risk for other trauma exposure (Kingston & Raghavan, 2009). Because of the proliferation of zero-tolerance policies, these types of conduct and substance use behaviors can lead to suspension and expulsion which can exacerbate developmental problems (American Psychological Association Zero Tolerance Task Force, 2008). Individual responses to trauma will vary and those who experience significant levels of subsequent psychological distress may be at greater risk for dropping out of school.

Studies focusing on the mental health correlates of academic achievement tend to be based on convenience tied to a specific event (Broberg et al, 2005) or clinical (Kennedy & Bennett, 2006) samples, while more representative data on school achievement has lacked sufficient information on mental health. Stoep et al. (2003) used the longitudinal Children in Community Study to estimate the risk of school failure in the U.S. population attributable to prevalence of adolescent psychiatric disorder. This epidemiological study estimated the proportion of dropouts in students with psychiatric disorder at 46%. However, the study is limited in its sampling of households in upstate New York which included only 6% minority representation.

Sociodemographic Factors Related to School Dropout

Mental health factors related to school dropout exist in sociodemographic contexts which may moderate their influence. The aggregate dropout rate provided by NCES (Laird et al., 2007) obscures the wide variation of disaggregated dropout rates reported for non-Hispanic White (6.0%), non-Hispanic Black (10.4%), Hispanic (22.4%), and Asian/Pacific Islander youth (2.9%), and for foreign-born Hispanic (36.5%) and non-Hispanic (4.7%) immigrants. Other estimates (Swanson, 2004b) suggest dropout rates of up to 50% for Black students and 47% for Hispanic students. Where comprehensive state records are available, Native Americans are shown to be at even greater risk for dropout compared to other minority groups (Stearns & Glennie, 2006). Racial/ethnic differences in educational attainment are confounded with socioeconomic status (SES) and urbanicity (Entwisle, Alexander, & Olson, 2005a; McGraw, Lubienski, & Strutchens, 2006), along with intergenerational patterns of limited academic achievement (Hardy, Astone, Brooks-Gunn, Shapiro, & Miller, 1998). Attainment for foreign-born youth is confounded with circumstances of immigration (Suárez-Orozco, Suárez-Orozco, & Todorova, 2008) and educational and social capital resources of immigrant parents (Hernandez, 1999), as immigration in general, and immigration at older ages, has been shown to be negatively related to school outcomes (Laird et al., 2007). There are also documented patterns of diminished achievement for boys as compared to girls (Laird et al., 2007) and these patterns may be moderated by race and ethnicity (Vélez & Saenz, 2001). These confounders are related to risk for trauma and subsequent psychiatric diagnosis (Oswald & Coutinho, 1996).

A recent comparison of urban and suburban districts in the country’s largest metropolitan centers found large gaps in graduation rates, the highest in Baltimore with a graduation rate of less than 35% for urban districts in contrast to over 81% in suburban counterparts (Swanson, 2008). Exposure to trauma and stress may be more prevalent for low-income minorities in urban communities, who may experience the greatest impact of neighborhood distress (Crowder & South, 2003). Studies of the effect of neighborhood violence in African American communities have documented decreased academic achievement as measured by more frequent absences, lower grades, and diminished expectations for the future (Bowen &

Bowen, 1999), as well as lower scores on standardized achievement tests (Thompson & Massat, 2005). Experience of chronic stressful life events was found to be negatively related to grade point average for Latino students (Alva & de Los Reyes, 1999; Gillock & Reyes, 1999).

Several additional factors have been shown to be related to high school completion rates. Regular employment at an early age (particularly when work exceeds 20 hours per week) may be negatively related to school achievement because of the time taken away from studies or because it acts as a proxy for a student from a family with limited financial resources, where the short-term benefits of work outweigh long-term educational planning (Stearns & Glennie, 2006; Warren & Cataldi, 2006). Early employment may also be the result of disengagement with school and it can vary as a risk or protective factor in relation to age of transition to work and type of job in a sample of urban adolescents (Entwisle, Alexander, & Olson, 2005b). Teen pregnancy has also been established as risk factor for girls' high school completion, with greatest risk for girls in high-poverty neighborhoods (Harding, 2003) and in low-income families (Stevenson, Maton, & Teti, 1998). Teen pregnancy can be cited as both a correlate of dropout as well as a consequence of school failure, with the highest risk of pregnancy at age 16 (Yampolskaya, Brown, & Greenbaum, 2002).

Research Aims and Approach

In this paper we examine the correlates of high school drop out in the United States using retrospective data of a young adult sample from a nationally representative dataset, the Collaborative Psychiatric Epidemiology Surveys (CPES). While there are limitations associated with the use of retrospective data, Hardt and Rutter's (2004) review of retrospective studies suggests that reporting of clearly operationalized adverse experiences during childhood have sufficient validity and reliability to support their use. A longitudinal study following adolescents into young adulthood found that although psychiatric symptoms were underestimated, the identification of risk factors was reliable (Wells & Horwood, 2004). Accuracy of retrospective reports of childhood trauma has also been supported (Paivio, 2001). Results from the CPES have been used to begin building provisional evidence regarding childhood onset of conduct disorder (Nock, et al., 2006), anxiety disorders (Suarez, et al., 2009), long-term consequences of childhood adverse experiences related to adult psychiatric disorders and suicidal ideation (Afifi et al., 2008), and persistence of separation anxiety disorder from childhood to adult status (Shear, et al., 2006). Available national datasets of child and adolescent development such as the National Longitudinal Study of Adolescent Health lack the depth of trauma and psychiatric data found in the CPES which is essential for testing our hypotheses.

For this study, we estimate the weighted prevalence rates for dropout adjusting for sampling design and then test the association of childhood traumatic stress, childhood psychiatric disorder and childhood use of mental health services to dropout status. We examine the association of trauma and mental health on dropout controlling for sociodemographic and psychosocial risk factors such as race/ethnicity, age of immigration, early employment, and family risk factors such as maternal education level. We hypothesize that experiences of early trauma and early onset of psychiatric disorders will be positively correlated with school dropout, controlling for sociodemographic variables and other risk factors, and that psychiatric disorders will mediate the relationship between early trauma and dropout. That is, the psychological consequences of trauma will lead to school dropout, not the trauma experience in and of itself. Further, we hypothesize that mental health services use will be a protective factor against school dropout. Because of the race/ethnic differences in dropout status (Laird et al., 2007), we also explore potential patterns of moderated mediation,

specifically the interactions between race/ethnicity and psychiatric disorders and mental health services use as potential mediators of trauma on school dropout

Methods

Sample Design and Data Collection Procedures

This analysis uses data from the Collaborative Psychiatric Epidemiology Surveys (CPES). The CPES is comprised of three nationally representative household surveys: the National Comorbidity Survey Replication (NCS-R; Kessler & Merikangas, 2004), the National Survey of American Life (NSAL; Jackson et al., 2004), and the National Latino and Asian American Study (NLAAS; Alegria et al., 2004). The CPES surveys were developed under the sponsorship of the National Institute of Mental Health (NIMH), and the data collection was conducted by the Survey Research Center (SRC) of the Institute for Social Research at the University of Michigan from early 2001 through the end of 2003. In-person interviews were conducted unless telephone interviews were requested or travel was prohibitive for interviewers. All respondents completed core protocol and screening questions (approximately 2.5 hours); additional sessions may have been necessary to complete follow up related to screening. The protocols were translated and bilingual interviewers were trained so that non-native English speaking respondents could answer in their native languages. This non-institutionalized community sample excluded incarcerated individuals or those residing in contained mental health facilities. More detailed information of the sample design and weighting is described by Heeringa et al. (2004). The full sample includes data from 20,013 adults ages 18 and older who participated in face-to-face structured interviews. The subsample for this analysis is limited to 2,532 cases of young adults aged 21 to 29, including foreign-born minorities living in the United States.

Age cutoffs for this analysis are based on several factors. Approximately 20% of students experience retention in a grade at least once during their school career and retention is related to higher odds for dropping out of school (Fine & Davis, 2003; Roderick, 1994; Stearns, Moller, Blau, & Potochnick, 2007). Although retention is a strong correlate of later dropout, the minimum age cutoff serves to limit potential cases of 18 to 20 year olds who have been retained yet remain enrolled in high school as an older student. The upper age range is informed by the World Health Organization definition of “youth” (individuals under the age of 30). We also aimed to limit our sample to young adults who are less temporally distant to their high school experiences when asked to retrospectively recall their childhood mental health. Although, the U.S. Federal government describes youth policies and programs that extend through the age of 25, the WHO definition allows for consideration of the larger age range of transitional age young adults. This is particularly important for immigrant youth who may experience non-linear educational patterns and difficult transitions into U.S. schools (Rong, & Preissle, 2009). Regulations established by the U.S. Department of Education ensure instruction for recently arrived (less than one year) Limited English Proficient students (34 CFR Part 200), as well as for students with Individualized Educational Plans (34 CFR Parts 300 and 301). Because immigrant youth may arrive with educational needs that overlap both of these areas there are opportunities for high school enrollment of young adults who immigrate after the age of compulsory general education but who are allowed to attend school up to age 22 (depending on the state). Alternative high school programs with specific supports for English language learners have been developed to better accommodate these young adult high school students (NCSALL, 2004). Including emerging adults, some who have had high school experience within their last 10 years, also allows for a larger sample size and greater statistical power for our analyses. Cases from the NCS-R were limited to US born non-Latino Whites (excluding all racial/ethnic minorities including Native American respondents as well as foreign born Whites due to lack of information about age of immigration). African Americans and Afro-Caribbeans (U.S. born

and immigrant) were included from the NSAL; Latinos and Asian Americans (U.S. born and immigrant) were included from the NLAAS. Designations of race/ethnicity presented here are kept consistent with terms used in the CPES datasets so that comparisons can easily be made with other literature from the study.

Measures

Demographic Characteristics—Demographic measures include dummy codes for the four major race/ethnicity categories of individuals (African American, Afro-Caribbean, Asian, Latino, and non-Latino White) who participated in the study. The CPES also provides information about subethnicities within the larger categories of Asians and Latinos. Descriptive results detail within group variation by sub-ethnic groups, however, cell sizes are not large enough to include this information in inferential analyses, and so aggregate race/ethnicity is used instead. Non-Latino White was selected as the reference group for analyses because it is comprised of non-immigrant youth with the lowest national dropout rate. Gender was included as a dichotomous independent variable.

Parental Education Level—Reports of highest year of formal education (“Number of years of school mother/father completed”) were used, as well as recoded dropout status, for both the mother and the father. Level of maternal education was included in regression models because the data was fairly complete compared to paternal education level (9% vs. 23% cases missing), whereas results reported for both parents are included in descriptive results.

Nativity—Four dichotomous variables were created to indicate whether the respondent was: U.S. born (reference category), foreign born and immigrated at age 12 or younger, immigrated at ages 13 to 17, or immigrated at age 18 or older. In the logistic regression analysis, U.S. born was used as the reference category.

Early Youth Employment—A dichotomous measure of youth employment was created from a question which asked for age at which the individual had first begun working for a period of six months or more. Early youth employment was coded as 1 if the age of first regular employment was 15 or younger (an age range where student work permits and restricted hours are required by state and federal law) and coded as 0 if aged 16 or older.

Early Unwanted Pregnancy—Women in the NLAAS subsample of the CPES were asked if they had ever had an unwanted pregnancy and if so, the age at which this first occurred. Unwanted pregnancy was coded as 1 if it occurred at age 16 or earlier, and otherwise coded as 0. Because data is limited to Latina and Asian American respondents in the NLAAS and because we have no corresponding information on early unwanted fatherhood, this variable is only included in the descriptive statistics.

Major Childhood Trauma—Retrospective report of significant traumatic life events was collected as part of the posttraumatic stress section of the World Health Organization Composite International Diagnostic Interview (WHO CIDI, Kessler et al., 2004). The WHO-CIDI is a fully structured diagnostic instrument administered by trained lay interviewers; diagnoses are based on the definitions and criteria of the Diagnostic and Statistical Manual of Mental Disorders, version 4 (DSM-IV). The international standard diagnostic system used is the WHO International Classification of Disease (ICD) 10-symptom criteria. For this analysis, we used reports of specific trauma events only and not the full diagnosis of PTSD. The WHO CIDI section of PTSD collects comprehensive data on lifetime trauma exposure, including information on 30 specific types of trauma and age of first exposure to each qualifying trauma, and assesses for presence and severity of PTSD symptoms for each

reported exposure. Of the 30 possible types of trauma asked in the WHO CIDI, nine variables identified in the literature as childhood risk factors were examined individually and also used to create a single dichotomous variable of major childhood trauma. These questions include:

- Were you ever involved in a life-threatening automobile accident?
- Were you ever involved in a major natural disaster, like a devastating flood, hurricane, or earthquake?
- Were you ever in a man-made disaster, like a fire started by a cigarette, or a bomb explosion?
- As a child, were you ever badly beaten up by your parents or the people who raised you?
- Were you ever badly beaten up by anyone else? [not including spouse or romantic partner which is a separate question]
- The next two questions are about sexual assault. The first is about rape. We define this as someone either having sexual intercourse with you or penetrating your body with a finger or object when you did not want them to, either by threatening you or by using force, or when you were so young that you did not know what was happening. Did this ever happen to you?
- Other than rape, were you ever sexually assaulted or molested?
- When you were a child, did you ever witness serious physical fights at home, like when your father beat up your mother?
- Did you ever see atrocities or carnage such as mutilated bodies or mass killings?

Respondents were asked the age at which the trauma event occurred. Major childhood trauma was coded as yes (1) if any one of these trauma events were reported as occurring at age 16 or younger. If none of these events was reported, or if one or more was reported as occurring at age 17 or older, this dichotomous variable was coded as no (0).

Psychiatric Diagnoses—Childhood psychiatric disorders were determined by the WHO CIDI. The WHO CIDI asks about lifetime disorders and age of onset (past-12-month criteria symptoms were also collected but are beyond the scope of this analysis which is focused on age 16 or younger at time of onset). A set of psychiatric disorders, as diagnosed by responses on the CIDI, were included as potential correlates of school dropout. For each of the following disorders a dichotomous variable was created and coded as 1 if age of onset was reported as age 16 or younger: depressive disorder, PTSD, anxiety disorder (not including PTSD), substance use disorder (drug abuse/dependence and/or alcohol abuse/dependence), and conduct disorder. Depressive disorder included major depressive episode and/or dysthymia. Although posttraumatic stress disorder (PTSD) is of the family of anxiety disorders, we investigated it separately in our descriptive analyses to determine the unique effect of trauma, and we set it aside for our regression analyses because we had used specific trauma events from the PTSD diagnostic checklist for our trauma variables. Anxiety disorder included agoraphobia, general anxiety disorder, panic disorder, and/or social phobia. Any diagnosis of substance abuse or dependence or alcohol abuse or dependence was used to indicate a single category of substance use disorders. Age of onset at 16 or younger is selected as cutoff for lifetime traumatic events and psychiatric disorders to bolster the likelihood that they would co-occur or precede the usual age that high school dropout might first occur. The specific psychiatric disorders selected to include in this analysis were thus chosen based on epidemiological studies demonstrating that they most

commonly emerge and/or peak in adolescence (Costello et al., 2003). These disorders, which are also differentiated by gender, are also more likely to demonstrate high rates for adolescents with pre-existing early childhood mental health problems including those which may be related to childhood trauma (Costello et al., 2003). For descriptive purposes, a global variable of any childhood DSM-IV diagnosis was created and coded as 1 if criteria for any one of the above disorders was reported or else 0 if no diagnosis was indicated.

Mental Health Service Use—To measure childhood and adolescent mental services use and test it as a potential protective factor, a dichotomous variable was created to include reported services from any of the following providers: psychiatrist, psychologist, social worker, counselor, health professional, nurse, spiritual advisor, or healer. This was coded as 1 if services were used at age 16 or younger; or 0 if otherwise.

Dependent Variable: Dropout Status—Statistics on dropout rates are presented in a variety of ways in local and national reporting and depending on the methods used, estimates may vary widely (Kaufman, 2004). For this analysis we use dropout status rate, which is defined as rate for non-completion of high school using data from young adults ages 29 and younger without regard for the specific year they stopped attending school. This is in contrast to dropout event rates, which calculate the percent of students who drop out of school in a given year, and is a considerably lower estimate than status rate because of its temporal limits to a one-year period. The dependent variable is created from a measure of formal years of completed education (*Highest grade of school/college completed?*). The CPES dataset recodes years of education into four main categories capturing high school dropout (0–11 years), high school completion (12 years), some college (13–15 years) or undergraduate degree or higher (16 years or more). A dichotomous variable of dropout status was created from this measure (1 = dropout [0–11 years of formal education] and 0 = high school completer [12 or more years of formal education]). Information regarding receipt of a general equivalency diploma (GED) is unavailable across the CPES dataset.

Statistical Analyses

Descriptive and inferential analyses were conducted using SAS 9.1 (SAS Institute, Inc., Cary, North Carolina). All analyses were weighted in order to account for the survey sampling design including the intentional over sampling of some subgroups, thus results presented are national estimates. First, we estimated the weighted prevalence of high school dropout for a young adult sample of US born and immigrant respondents ages 18 to 29. Significance tests for group differences were conducted using a Rao–Scott chi-square statistic for contingency tables with survey data (Rao & Scott, 1984; Rao & Thomas, 1989). We also examined correlates of dropout status in logistic regression models including demographic variables, early work experience, early unwanted pregnancy, and childhood trauma experience.

Next we conducted multiple mediation analysis to examine whether diagnosis of childhood psychiatric disorder along with mental health services use during childhood mediate the relationship between major childhood trauma and high school dropout status. To infer mediation we needed to establish four criteria: 1) significant relationship between childhood trauma and high school dropout status; 2) significant relationship between the psychiatric diagnosis and services use variables and childhood trauma; 3) significant relationship between the psychiatric diagnosis and services use variables and dropout adjusting for childhood trauma; and 4) the association between childhood trauma and dropout weakens after adjusting for the psychiatric diagnosis and services use variables (Baron & Kenny, 1986; MacKinnon, Fairchild, & Fritz 2007). We infer that the relationship between childhood trauma and high school dropout is *completely* mediated by psychiatric diagnosis

and services use variables if the regression coefficient for childhood trauma is no longer significant after adjusting for psychiatric diagnosis and services use variables. The psychiatric diagnosis and services use variables were entered as a set of variables in a multiple mediation model and tested as a group, which is useful when considering variables that would be theoretically correlated with each other; one or all variables could be significant individual mediators in a multiple mediation model (Preacher & Hayes, 2008). The indirect effect of childhood trauma on dropout that is mediated through psychiatric diagnosis and services use variables is estimated as the total effect of childhood trauma on dropout minus the direct effect of childhood trauma on dropout after adjusting for the psychiatric diagnosis and services use variables. We used bootstrap method to construct the confidence interval for the estimated indirect effect.

Missing maternal education values were multiply imputed using the PROC MI procedure in SAS. Regression models were adjusted for sampling design through a first-order Taylor series approximation, and significance tests were performed using design-adjusted Wald tests. We report odds ratios and 95% confidence intervals.

Results

Prevalence and Descriptive Results

Weighted results indicated that 15.57% of young adults dropped out of high school (Table 1). Design-adjusted chi-square results showed significant differences in the distribution of dropout by racial/ethnic group ($p < 0.001$). Asians had the lowest rate of dropout (5.58%), followed by Whites (8.37%), African Americans (17.19%) and Afro-Caribbeans (19.02%), whereas Latinos had the highest rate of high school dropout (38.89%). The Asian and Latino groups were also broken down by larger sub-ethnicities and dropout rates were compared using survey design-adjusted chi-square tests, revealing significant differences between Asian sub-ethnicities ($p < 0.047$), with the highest dropout rate for Vietnamese (18.68%) compared to Filipinos (5.16%), Chinese (4.02%) and all other Asians (4.41%), and significant differences between Latino sub-ethnicities ($p < 0.001$) with the lowest rate for Cubans (13.46%) compared to Puerto Ricans (27.50%), Mexicans (45.99%) and all other Latinos (29.17%). When compared against each other there was no statistical difference between dropout rates of African Americans and Afro-Caribbeans.

There were no significant differences by gender with the male dropout rate at 16.18% and females at 14.98% ($p=0.625$). Dropout rates were significantly different between the nativity groups ($p<0.001$). Rates were lowest for U.S. born respondents (12.02%), but more than doubled for respondents who had immigrated to the U.S. at age 12 or younger (25.40%), more than four times as high for immigrants who arrived in the U.S. as adolescents (51.52%), and almost three times the rate for those who immigrated as adults (32.89%). We also looked at dropout rates for Latinos, Asians, and Afro-Caribbeans by immigration age categories. We found that Latinos had the highest dropout rate across all age immigration categories (for age 12 or younger, age 13 to 17, and 18 and older, the dropout rates were 36%, 63%, and 53% respectively). Afro-Caribbeans have fairly steady dropout rates at the younger (19%) and older (21%) immigration age categories but a lower rate for those who immigrated between age 13–17 (12%). We also observed that Asians had the lowest dropout rates compared to other immigrant groups. Asian dropout rates for immigration category at age 12 or younger was 9%; 5% dropout rate for immigration at ages 13 to 17; and 6% for those who immigrated as young adults. Respondents who dropped out of high school reported significantly lower parental education levels compared to non-dropouts: 53% reported that their mothers had also dropped out of school ($p<0.001$), and 62% reported that their fathers had also dropped out of school ($p<0.001$). Dropouts rates were marginally higher among girls from the NLAAS sample who had experienced early unwanted

pregnancy (43.93%) compared to girls who did not report that experience ($p=0.050$). The dropout rate in youth who had entered the workforce at an early age (16.98%) was not significantly different from the dropout rate in youth who had not entered the workforce at an early age ($p=0.478$).

Psychiatric Characteristics of Dropouts

Thirty-eight percent of the CPES young adult subsample reported experiencing a major childhood trauma occurring at age 16 or younger (Table 2). Of those respondents who reported experience of any major childhood trauma, 19.79% dropped out of school, a significantly higher rate than those who did not report childhood trauma (12.97%, $p < .001$). Review of specific trauma experiences found significantly higher dropout rates were for those who had experienced child physical abuse (31.13%), witnessed domestic violence (26.01%), experienced rape (25.34%), were beaten (24.82%), or experienced a natural disaster (22.43%) compared to those who had not experienced those same specific traumas. Similarly, the dropout rate for respondents with childhood onset of substance disorder or conduct disorder was much higher (24.22% and 28.51% respectively) compared to respondents without those childhood disorders. Almost one-third of the sample (32.05%) reported symptoms which indicated childhood onset of one or more DSM-IV diagnoses, and the dropout rate for those respondents was significantly higher than for those without a childhood onset diagnosis (19.75% vs. 13.60%, $p < .01$). However a lower percentage (17.02%) reported use of any mental health services during that same age range (16 or younger).

Logistic Regression and Mediation Analysis

In Table 3, we present the results of our logistic regression models examining correlates of dropout status. In Model 1, Asians had significantly lower odds of dropping out (OR=0.41, 95% CI=[0.20,0.84]) compared to non-Latino White youth adjusting for demographic variables, early work experiences, and childhood trauma experience. In contrast, Afro-Caribbeans (OR=1.98[1.14,3.44]), African Americans (OR=2.18[1.40,3.40]), and Latinos (OR=2.88[1.88,4.44]) were more likely to report dropping out of high school as compared to non-Latino Whites. Those who immigrated as a young adult (age 18 and older) were marginally more likely (OR=1.54[1.01,2.34]) to have failed to complete a secondary education, in either their home country or the U.S., as compared to U.S. born respondents. With each year of maternal education completed, youth had decreased odds of dropping out of high school (OR=0.83[0.78, 0.87]).

Next, we examined possible mediation of the relationship between childhood trauma and high school dropout status by psychiatric disorders and mental health services use by assessing the four criteria for establishing mediation (see Figures 1A and 1B). We found that childhood trauma is significantly associated with dropping out (Table 3 Model 1; OR=1.65[1.18, 2.32]) and childhood trauma is also significantly associated with psychiatric diagnosis and services use variables (results not shown), thus satisfying the first two criteria. In Model 2 we added psychiatric diagnosis and services use variables to Model 1 and found that some of these variables were significantly associated with high school dropout status, thus fulfilling the third criteria. Particularly, the odds ratio of dropping out were 2.48[1.30, 4.74] for those with a childhood onset of substance disorder compared to those without substance disorder, and 2.38[1.43, 3.96] for those with childhood onset conduct disorder compared to those without conduct disorder. In contrast, mental health services use was not significantly associated with dropout after adjusting for childhood trauma and other covariates (OR=0.95[0.57,1.59]), and thus failed to satisfy the third criteria for mediation. Therefore, mental health services use was not considered a mediator of the relationship between childhood trauma and school dropout. After adjusting for the psychiatric diagnoses

variables, the odds ratio of dropping out associated with childhood trauma were reduced to 1.36[0.98, 1.89], thus satisfying the last criteria. Since the odds ratio associated with childhood trauma was no longer statistically significant in Model 2, it suggests that the set of multiple mediators completely mediated the relationship between childhood trauma and dropout. The indirect effect of childhood trauma on dropout via the psychiatric diagnosis variables was estimated as a reduction in the odds ratio of dropout by 1.21[1.11,1.41] times.

Exploratory Moderated Mediation Analysis

As an additional exploratory analysis, we examined possible moderated mediation of the psychiatric diagnosis and services use variables moderated by race/ethnicity (MacKinnon, Fairchild, & Fritz, 2007). For this analysis we used the same model as Model 2 of Table 3 with additional variables that are interactions between each of the psychiatric diagnoses and services use variables and each of the major race/ethnicity groups, adjusting for the same sociodemographic variables as in Model 2 of Table 3. When we added the psychiatric diagnosis and services use variables and the interaction between these variables and race/ethnicity to Model 1, the odds ratio of dropping out associated with childhood trauma decreased from 1.65[1.18,2.32] to 1.35[0.97,1.88] (results not shown). Results suggest that the relationship between childhood trauma and dropping out of high school is mediated by psychiatric disorders and their interactions with race/ethnicity. More specifically, Afro-Caribbeans with childhood onset depressive disorders (OR=8.64[2.25, 33.11] and Latinos with childhood onset of anxiety disorders (OR=5.81[2.26,14.90]), and African Americans with childhood onset of conduct disorders (OR=2.70[1.00,7.27]) were more likely to report dropping out of high school compared to their non-Latino White counterparts. In contrast, Asians with childhood onset of depressive disorders, childhood onset of anxiety disorders, or those who have received mental health services as children were much less likely to report dropping out of high school compared to their non-Latino White counterparts in the same circumstance ($p < 0.0001$).

Discussion

Dropout Patterns and Correlates

The aim of this study was to report on factors related to high school dropout among a nationally representative sample of U.S. young adults of diverse ethnic, racial and socioeconomic backgrounds as well as immigration history. Our data presents a unique opportunity to examine both mental health and childhood traumatic events as factors that may impact school achievement. Childhood exposure to trauma was related to higher risk for school dropout as mediated by childhood psychiatric diagnoses. Individuals who had reported childhood diagnostic indicators of conduct disorder or substance abuse were almost two and a half times more likely to drop out of school. Behaviors signaling these specific disorders not only interfere with learning but are also likely to lead to punishment and exclusion from academic activities without benefit of necessary therapeutic interventions (see Ayers, Dohrn, & Ayers, 2001).

We found the rate of dropout among African Americans to be double that of non-Latino Whites and the dropout rate for Latinos to be double that of African Americans and Afro-Caribbeans, while the dropout rate for Asians was lower than their non-Latino White counterparts. In fact, close to 40% of Latinos in our sample have a history of dropping out of school and this is followed by 17% of African Americans. In addition, we found that upon closer examination, the significantly lower rate of dropout for Asian students may obscure risk for specific Southeast Asian subgroups. The dropout rate for Vietnamese young adults in our sample was similar to that of Afro-Caribbeans (18.68% compared to 19.02%). Given the small sample sizes for the Afro-Caribbean ($n = 280$) and Vietnamese ($n = 63$) subgroups

and the potential influence of patterns of immigration, these relationships should be explored further in future research.

Although the National Center for Education Statistics (NCES), U.S. Department of Education dropout rate of 9.4% (Laird et al., 2007) and the CPES rate for young adults of 16% are not fully aligned, there are a number of possible explanations for the difference. NCES data reported that in the U.S. 22% of Latinos, 10% of African Americans, 6% of non-Latino Whites, and 3% of Asians drop out of school (Laird et al., 2007), while the CPES results showed the same rank order but provided higher rates for each racial/ethnic category. The CPES data is derived directly from young adult respondents and provides greater distinctions between sub-ethnic categories. For example, the NCES aggregated rate for Asian students is lower than that of the CPES, however, the CPES disaggregated rates also reveal the wide discrepancies between various Asian sub-ethnicities. The CPES also sampled individuals who would not have been counted in NCES data pools if they immigrated as adolescents but did not enter the public school system. Data for the NCES rates are derived from multiple sources including household interviews, public school records, and administrative records kept by the GED Testing Service. Because there is no standardized system of keeping track of dropout status in U.S. public school records, these are the most vulnerable to inconsistency and inaccuracy (Kaufman, 2004). For example, in some states students are not counted as dropouts although they may be expelled or incarcerated, nor are they counted as non-completers even if they do not pass required proficiency tests for high school graduation (Lofstrom, 2007). Neither the NCES nor the CPES include data on incarcerated youth and estimates of dropout rates vary depending on federal (30%) or state (40%) inmate status and death row (50%) status (U.S. Department of Justice Bureau of Justice Statistics, 2002). The lack of information from incarcerated youth in the CPES, which is comprised of an older community sample, may account for the discrepancy in dropout patterns by gender for this analysis compared to that found in other national datasets such as the NCES, which document the increased odds of male dropout.

Race, Ethnicity, Immigration and Dropout in the US

We found that immigration status is an important correlate of dropout, even when adjusting for mental health, trauma and potential stressors such as youth employment before age 16 years. Among minorities in the US, adjusting to a new country vs. being US born and growing up in a disenfranchised community poses risks for school dropout (Velez, 1989). The odds of dropping out were significantly higher for individuals who immigrated to the US after age 12, that is, in adolescence. This points us to the importance of examining the particular adjustments and risks for a young person immigrating to the U.S. at this critically important developmental stage. Important developmental issues include identity development, potential risk behaviors, and trauma (Finkelhor, Ormrod, & Turner, 2007; Giaconia, Reinherz, Silverman, & Pakiz, 1995). There are potential protective factors that can improve outcomes for youth at this developmental period as well. Fuligni (1997) studied approximately 1,100 adolescents with Latino, East Asian, Filipino, and European backgrounds and their own reports of academic attitudes and behaviors as well as those of their parents and peers. Students' course grades were obtained from their official school records. Results indicated that first and second generation students received higher grades in mathematics and English than their peers from native families. Only a small portion of their success could be attributed to their socioeconomic background; a more significant correlate of their achievement was a strong emphasis on education that was shared by the young person, their parents, and their peers. These demographic and psychosocial factors were also important in understanding the variation in academic performance among the immigrant students themselves (Fuligni, 1997). Similarly, a study of Caribbean immigrant youth found

higher ratings of academic self-concept for first and second-generation compared to third generation counterparts (Mitchell, 2005).

However, both immigration and adolescence are risk factors for traumatic experiences (Jaycox et al., 2002; Kataoka et al., 2003) and other significant stressors, which can result in mental health disorders such as anxiety and behavioral disorders (Bremne & Vermetten, 2001; Jaycox et al., 2002; Kataoka et al., 2003; Lemos-Miller & Kearney, 2006). Adolescents with PTSD also commonly meet criteria for substance use disorders and other psychiatric disorders including depressive disorders (Donnelly & Amaya-Jackson, 2002). The temporal sequence of these problems is difficult to determine due to a dearth of longitudinal studies examining the relationships between trauma, PTSD, and substance abuse disorders in children and adolescents. However, Kilpatrick et al. (2000) found that PTSD mediated the relationship between victimization and risk for current substance use disorder and delinquent behavior. We found that psychiatric disorders, specifically substance abuse disorders and conduct disorders, mediate the relationship between childhood trauma and dropout status. These two disorders are associated with poor academic performance, truancy, and deviant behaviors that violate school policies, which often result in suspension or expulsion (Townsend, Flisher, & King, 2007). Although we did not find a relationship between services use and dropout we did find that services use was limited for youth with psychiatric disorders. Services use may be protective if referrals to school mental health services are increased and used in addition to, or instead of, more punitive responses in order to provide much needed intervention for these students.

Empirical research findings suggest that for adolescents, cultural assimilation is a risk factor for increases in negative health behaviors and mental health problems. Conversely, biculturalism appears to be an emerging protective factor that buffers assimilation stress, enhances socio-cognitive functioning, and increases academic achievement (Pantin et al., 2003). In our sample, individuals who immigrated to the United States at age 18 or older still experience significant increased odds of not completing at least 12 years of education compared to their U.S. born peers. Given the timing of immigration, these students would likely not have completed secondary school in their home country (Wechsler & Oakland, 1990). Although we must also take into account the possibility of variation in years of schooling needed to complete secondary education in international educational systems (ranging from age 17 to 20); for example, Mexico has an expected graduation age of 18 with the most recent reported rates of high school graduation at 40% (OECD, 2007). At the least we can assume more limited formal education for older adolescent immigrants, and restricted opportunities for entry into the US educational system. Limited educational outcomes may be related to some of the above risk and mental health factors, but also likely related to being an older student upon arrival with the competing employment and financial stressors attached to immigration status and young adulthood. Young adult immigrants may be particularly underrepresented among school completers yet this is also a much underserved population in regards to mental health services and educational programming (Suárez-Orozco, Suárez-Orozco, & Todorova, 2008).

Mental Health in a Racial Ethnic Context

The exploratory analyses we conducted to test moderated mediation revealed a statistical interaction showing an effect of childhood trauma on dropout which was mediated by psychiatric illness but which differs by race and ethnicity. Specifically, African Americans with childhood onset conduct disorders and Afro-Caribbean individuals who have had childhood depressive disorders are more likely to dropout compared to non-Latino Whites with similar histories. This outcome likely represents a particular risk for dropout among Black students, which is further exacerbated by trauma and psychiatric illness. The vulnerability for dropout given a history of mental health need among Black students has

been found in the literature to include the lack of culturally appropriate treatment, chronic and recurrent trauma and stress, poverty, poor schools and communities with an overabundance of violence and disproportionate representation in the juvenile justice system (Kennedy & Bennett, 2006; McGauhey & Starfield, 2003; Oswald & Coutinho, 1996).

Similarly, Latinos with childhood anxiety disorder are more likely to dropout than non-Latino Whites with a history of trauma and anxiety. Again, the ethnic and racial context of having an anxiety disorder for Latinos may be compounded by quality and access to mental health services and the psychosocial context of the trauma and anxiety including poverty, and for immigrants the varying levels of psychosocial adjustment and stress (Jaycox et al., 2002). This may explain why Latinos were the only ethnic group in our sample with an increase in odds for dropout when DSM and service use variables were added to the model. Kataoka et al. (2003) found that close to 30% of Latino youth in a middle school with high representation of immigrant Latinos suffered from PTSD and or other anxiety symptoms. Taken together, the findings related to ethnicity and race support the need to strengthen research and practice regarding culturally appropriate assessment and trauma-informed interventions for particularly vulnerable youth populations.

Limitations

This dataset lacks detailed information about specific degrees attained, as information on high school diploma, general equivalency diploma (GED), or college or higher education degree was not collected as part of the survey protocol. The attainment of a GED is correlated with individual motivation and personality differences (Entwisle, Alexander, & Olson, 2004) which may also be associated with mental health outcomes. Given the impact of poverty on educational attainment, the study is further limited by lack of information on family income during childhood, despite being able to control for parental education. Although Attention-Deficit/Hyperactive Disorder (ADHD) is a psychiatric risk factor associated with diminished academic achievement (Biederman et al., 2004) and school dropout (Barbarelli, Katusic, Colligan, Weaver, & Jacobsen, 2007), it was not included in the data collection protocol across the CPES sample because of concerns of poor reliability in retrospective reporting for symptoms of this particular psychiatric illness (Loney, Ledolter, Kramer, & Volpe, 2007; Mannuzza, Klein, Klein, Bessler, & Shrout, 2002). Additional studies are needed to tease out the specific effects of ADHD and PTSD, as ADHD is often comorbid with anxiety disorders (Costello, 2003).

Childhood neglect may be just as disruptive to educational achievement (Rodgers, et al., 2004) and may operate in a pattern similar to that of trauma, associated with dropout and mediated by psychiatric diagnosis. However the CPES does not contain the same depth of information about childhood neglect across the sample. Because a dose-effect of childhood adversity has been found to be associated with greater risk for adult mental health disorders (Edwards, Holden, Felitti, & Anda, 2003), further research is needed to examine the comparative influence of trauma and neglect on educational outcomes, and to explore the timing, frequency, intensity, and co-occurrence and interaction of the various types of both trauma and neglect, as well the impact of chronic childhood adversity versus time-limited or acute trauma events.

Theoretical and practical implications

Trauma experiences in young children and adolescents may have a significant impact on academic achievement and subsequent risk of dropout (Dyregrov, 2004; Harris, 1983; Rousseau et al., 1999; Thompson & Massat, 2005). Only recently have educational systems begun to direct attention to psychological support and intervention services; the limited services that do exist tend to be marginalized and fragmented within schools (Adelman &

Taylor, 2009; Dean et al., 2008). Teacher preparation at pre-service and in-service professional development is limited in providing any training in the area of mental health (Koller, Osterlind, Paris, & Weston, 2004; Waller, 2006). Walter et al. (2006) found that while urban teachers reported disruptive behavior as the greatest mental health problems in their schools, they also reported minimal training in this area. Psychiatric conditions may be interpreted by educators with limited knowledge of mental health as simply not caring about school or as disruptive students that should be dealt with punitively rather than therapeutically, and this may be exacerbated for minority students where studies have shown lower teacher expectations of competence (Good, 1987; Harry & Klingner, 2005).

Mental health services use was not identified as a protective factor, and while there did not appear to be significantly greater use of services by dropouts, the limited use reported (relative to psychiatric disorders identified) may reflect the severity of psychiatric disorders. School mental health systems often lack adequate integration and collaboration between school staff and mental health professionals (Rappaport et al., 2003). Improving these collaborations would improve student achievement outcomes as well as student mental health. Improved screening tools and referral strategies are needed to identify student mental health needs and provide adequate services, especially for underserved and immigrant populations.

Policy implications

National and local educational policy decisions have been largely determined by directives of the No Child Left Behind legislation (2001). Despite controversy about its goals and outcomes and its likelihood of being renewed, its core objectives of educational accountability will continue to guide educational policy as states vie for Race to the Top funding. To that end, it will be important to expand concerns about scores on standardized achievement tests to increased national attention regarding dropout rates (Darling-Hammond, 2006). Multidimensional approaches that attend to intellectual, physical, and mental health could significantly increase school achievement (Lee, Janik, & Phelps, 2006). Gleason and Dynarski (2002) in their analysis of dropout programs supported by the U.S. Department of Education found that multiple factors best identified those students most at risk and suggest that greater efforts be made to include psychological factors in developing programs that target dropout prevention. Some encouraging dropout prevention programs that integrate access to mental health services have been described for urban students in national (Lever et al., 2004) and international settings (Graeff-Martins et al., 2006). Specific strategies such as training in coping skills have also been suggested in response to students' experience of stressful life events related to risk of dropout (Hess & Copeland, 2001). Focused investigation of mental health correlates of academic achievement outcomes is relatively new and the results presented here underscore the importance of continued exploration into the understanding mechanisms of risk, and for developing academic interventions with integrated mental health components.

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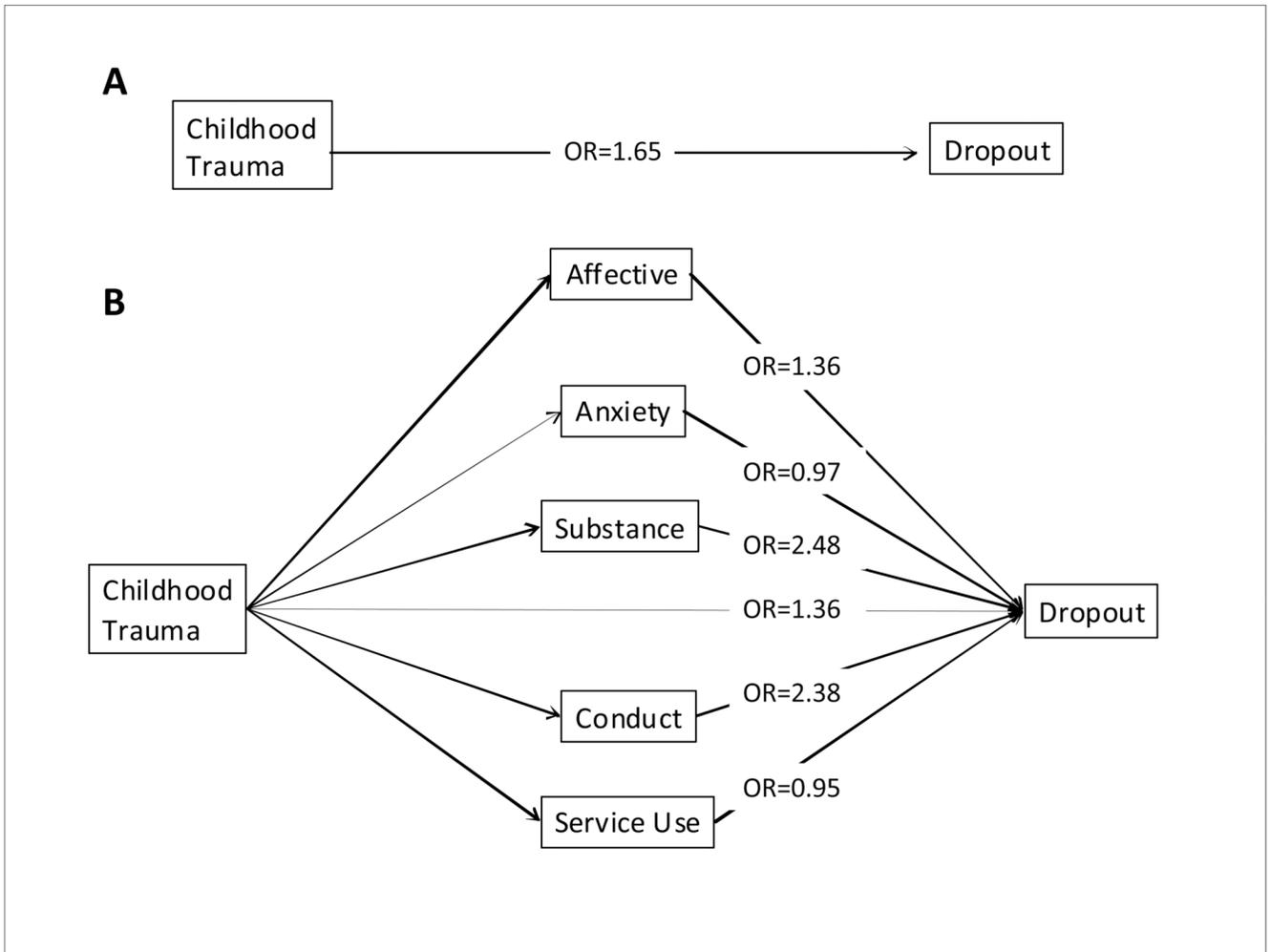


Figure 1. Figures 1A and 1B Total effect of childhood trauma on dropout (A) and indirect effect of childhood trauma on dropout via multiple mediators: DSM-IV disorders and mental health services use (B). Odds ratios presented

Table 1

Sample characteristics for U.S. youth ages 21–29 (n=2532).

Weighted	Percent of Population (s.e.)	Dropout Rate Percentage (s.e.)	p-value
Sample dropout rate		15.57 (1.09)	
Gender			.6253
Male (n=1050)	48.83 (1.64)	16.18 (1.76)	
Female (n=1482)	51.17 (1.64)	14.98 (1.54)	
Ethnicity – population prevalence for dropout			<.0001
Asian (n=404)	5.20 (0.67)	5.58 (1.76)	
African American (n=585)	12.41 (1.24)	17.19 (1.66)	
Afro-Caribbean (n=280)	0.97 (0.11)	19.02 (1.74)	
Latino (n=593)	20.13 (2.34)	38.89 (1.99)	
Non-Latino White (n= 670)	61.28 (3.24)	8.37 (1.28)	
Nativity			<.0001
US born (n=1770)	83.87 (1.64)	12.02 (0.99)	
Immigration age 12 or younger (n=275)	5.22 (0.62)	25.40 (3.38)	
Immigration age 13 to 17 (n=149)	3.06 (0.43)	51.52 (5.37)	
Immigration age 18 or later (n=338)	7.85 (1.06)	32.89 (4.04)	
Youth employment			.4784
Employed 6+ months at age 15 or younger (n=412)	27.35 (2.25)	16.98 (2.49)	
Early unwanted pregnancy			.0500
Unwanted pregnancy at age 16 or younger (NLAAS females only, n=531)	4.60 (0.89)	43.93 (6.02)	

Table 2

Rates of trauma experience, psychiatric disorder and service use for U.S. youth ages 21–29 (n=2532).

Weighted	Percent of Population (s.e.)	Dropout Rate Percentage (s.e.)	Dropout Rate Percentage (s.e.)	p-value	Did Not	
					Experienced Trauma	Experience Trauma
Experience of major childhood trauma						
Any major childhood trauma (age 16 or younger; n=1046)	38.11 (1.83)	19.79 (1.82)	12.97 (1.27)	.0010		
Life threatening car crash (n=173)	6.87 (0.69)	21.52 (4.01)	15.13 (1.10)	.0715		
Natural disaster (n=296)	8.93 (0.71)	22.43 (3.62)	14.89 (1.23)	.0426		
Manmade disaster (n=73)	3.77 (0.75)	9.56 (3.82)	15.80 (1.12)	.1946		
Child physical abuse (n=186)	6.42 (0.55)	31.13 (5.38)	14.50 (1.13)	.0002		
Beaten (n=136)	6.30 (0.86)	24.82 (4.52)	14.95 (1.22)	0.0246		
Raped (n=193)	6.35 (0.68)	25.34 (4.00)	14.90 (1.12)	.0030		
Molested (n=273)	9.46 (0.89)	13.62 (2.55)	15.77 (1.21)	.4858		
Witnessed domestic violence (n=396)	13.26 (0.94)	26.01 (3.38)	13.97 (1.11)	<.0001		
Witnessed atrocities (n=41)	1.43 (0.40)	21.94 (8.58)	15.47 (1.13)	.4133		
Childhood DSM-IV disorder (age 16 or younger)						
Any childhood DSM-IV diagnosis (n=775)	32.05 (1.14)	19.75 (1.88)	13.60 (1.34)	.0061		
Childhood Depressive Disorder (n=225)	8.87	17.70	15.36	.5255		

Weighted	Percent of Population (s.e.)	Dropout Rate Percentage (s.e.)	Dropout Rate Percentage (s.e.)	p-value
	(0.79)	(3.55)	(1.18)	
Childhood PTSD (n=115)	4.05	19.55	15.40	.3389
	(0.51)	(4.67)	(1.11)	
Childhood Anxiety Disorder (non-PTSD) (n=368)	14.62	14.76	15.70	.6532
	(0.97)	(1.89)	(1.19)	
Childhood Substance Disorder (n=143)	6.73	24.22	14.94	.0107
	(0.85)	(4.31)	(1.08)	
Childhood Conduct Disorder (n=287)	10.90	28.51	13.98	<.0001
	(0.86)	(3.90)	(1.21)	
Received mental health services as a child	17.02	13.49	15.99	.3642
(age 16 or younger; n=405)	(1.09)	(2.26)	(1.26)	

Table 3

Series of weighted logistic regressions predicting dropout for combined CPES sample (n=2532). Odds ratios and 95% confidence intervals presented

Independent Variables	Model 1	Model 2
	Demographic Variables and Trauma	Test of Mediation
	OR (95% CI)	OR (95% CI)
<u>Gender</u>		
Male	1.03 (0.67,1.58)	0.93 (0.61,1.41)
Female	1	1
<u>Race/Ethnicity</u>		
Asian	0.41 (0.20,0.84)	0.41 (0.20,0.84)
African American	2.18 (1.40,3.40)	2.15 (1.37,3.37)
Afro-Caribbean	1.98 (1.14,3.44)	1.85 (1.11,3.06)
Latino	2.88 (1.88,4.44)	3.01 (1.91,4.72)
Non-Latino White	1	1
<u>Nativity</u>		
Immigrated age 12 or younger	1.08 (0.73,1.61)	1.22 (0.82,1.83)
Immigrated age 13 – 17	1.60 (0.93,2.77)	1.92 (1.08,3.42)
Immigrated age 18 or older	1.54 (1.01,2.34)	1.82 (1.17,2.82)
US born	1	1
Maternal education in years	0.83 (0.78,0.87)	0.82 (0.77,0.88)
Youth employment age 15 or younger	1.60 (0.94,2.72)	1.54 (0.92,2.60)
Major childhood trauma before age 17	1.65 (1.18,2.32)	1.36 (0.98,1.89)
Childhood onset Affective Disorder		1.36 (0.73,2.53)
Childhood onset Anxiety Disorder (non-PTSD)		0.97 (0.66,1.43)
Childhood onset Substance Disorder		2.48 (1.30,4.74)

Independent Variables	Model 1	Model 2
	Demographic Variables and Trauma	Test of Mediation
	OR (95% CI)	OR (95% CI)
Childhood onset Conduct Disorder		2.38 (1.43,3.96)
Received mental health services as a child		0.95 (0.57,1.59)