

Racial Heterogeneity and Mental Illness: A Study on Detained Youth Across Multiple Counties

Lau, Katherine S. L.; Aalsma, Matthew C.; Holloway, Evan D.; Wiehe, Sarah E.; Vachon, David D.

Abstract

A majority of detained adolescents experience mental health and substance use problems. Limited research has examined the interaction of race/ethnicity and county-level racial heterogeneity on adolescent mental health outcomes. Participants were identified through a statewide mental health screening project that took place in detention centers across 11 different counties in a Midwestern state during January 1, 2008 to May 10, 2010. A total 23,831 detained youth (ages 11-18 years), identified as non-Hispanic white (46.6%), black (43.5%), or Hispanic (9.8%) completed a mental health screener that assessed problems in alcohol/drug use, depression-anxiety, anger-irritability, trauma, somatic complaints and suicide ideation. Census data was gathered for county-level variables. Hierarchical linear regression analyses were used to test the independent and interactive effects of race/ethnicity and county-level variables on adolescent mental health. Independent of other structural factors, county-level racial heterogeneity acted as a protective factor against mental health problems in detained youth. However, the beneficial effects were primarily observed in non-Hispanic white detained youth. Racial heterogeneity has a differential impact on adolescent mental health depending on the race/ethnicity of the youth. Neighborhood and individual-level factors should be addressed in the development and maintenance of mental health problems in detained youth.

This is the author's manuscript of the article published in final edited form as:

Lau, K. S. L., Aalsma, M. C., Holloway, E. D., Wiehe, S. E., & Vachon, D. D. (2015). The effects of racial heterogeneity on mental health: A study of detained youth across multiple counties. *American Journal of Orthopsychiatry*, 85(5), 421–430.

<https://doi.org/10.1037/ort0000100>

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In the United States, approximately 1.32 million youth under the age of 18 were arrested in 2012 (Puzzanchera & Kang, 2014), and roughly 1.15 million delinquency cases were processed in juvenile courts (Sickmund, Sladky, & Kang, 2015). Of these youth offenders, 227,900 were placed in detention, 87,500 were sent to residential placement, and 4,600 transferred to adult court (Sickmund et al., 2015). Youth involved with the juvenile justice system are an especially vulnerable population who experience high rates of undetected psychopathology and substance use disorders (Aalsma, Schwartz, & Perkins, 2014; Teplin, Welty, Abram, Dulcan, & Washburn, 2012). Involvement with the juvenile justice system however, is not entirely dependent on individual-level factors. Various theories posit that social stratification and structural factors at neighborhood and city levels lead to more mental health problems and crimes (Hipp, 2007a; Kubrin & Weitzer, 2003; Sampson & Groves, 1989; Turner 2013). Moreover, the decision to arrest, detain, and incarcerate youth by the juvenile justice system is often influenced by how the system views the community (e.g., resources, neighborhood crime, family stability) that the youth is embedded within (Bishop, Leiber, & Johnson, 2010).

Studies on structural and stratification factors show communities that are racially homogenous possibly due to forces such as racial/ethnic residential segregation and racial discrimination are frequently associated with higher concentrations of poverty and unemployment rates, poor social cohesion and social stability, and single-parent households that often result in higher rates of crime, violence, and delinquency (Hipp, 2007b; Kubrin & Weitzer, 2003; Sampson & Groves, 1989; Stafford, Becares, & Nazroo, 2009; Ulmer, Harris, &

Steffensmeier, 2012). In turn, studies examining socioeconomic disadvantage and racial segregation generally show that residents are at greater risk of lower overall levels of educational attainment (Corcoran, Gordon, Laren, & Solon, 1992), higher levels of teen pregnancy (Sucoff & Upchurch, 1998) and, greater rates of teen substance abuse (Chuang, Ennett, Bauman, & Foshee, 2005). All these factors associated with racial/ethnic segregation and concentrated disadvantage can act as chronic stressors that affect an individual's physical and psychological well-being. This has been found to be especially true for Black youth (Turner, 2013). For example, exposure to criminal activity can act as a stressor in the community leading to mental health problems. Community (i.e., non-forensic) youth residing in low socioeconomic neighborhoods reported perceiving more hazards such as crime, violence, and drug use than youth who lived in high socioeconomic neighborhoods; the more hazardous the neighborhood, the greater reports of depression, anxiety, oppositional defiant disorder, and conduct disorder (Aneshensel & Sucoff, 1996). Similarly, Black community youth living in areas of greater socioeconomic disadvantage reported higher baseline stress levels and steeper increases in stress over time (Brenner, Zimmerman, Bauermeister, & Caldwell, 2013). Further analyses revealed that the association between socioeconomic level and stress was fully mediated by greater adolescent substance use, poorer social support, and negative perceptions of the neighborhood. The results of these studies indicate that structural and social stratification factors are associated with increased rates of mental health problems in youth. The association between structural and stratification factors on mental health may be attributable to the undue stress caused by such things as poorer socioeconomic status, greater violence exposure, and poorer social support networks.

Although many studies have demonstrated the effects of structural and stratification factors on crime, and physical and mental health outcomes at the neighborhood levels, fewer have examined whether structural and stratification factors like the racial composition of a neighborhood act similarly in larger geographic units such as cities and counties. At larger geographic units some positive associations have been found (e.g., Hipp, 2011; McVeigh, 2006), where greater racial/ethnic heterogeneity and greater income inequality were associated with higher levels of crimes, whereas other studies have found spurious or mixed results (Beyerlein & Hipp, 2005; Hipp, Bauer, Curran, & Bollen, 2004). Despite these mixed results, the majority of studies demonstrate that contextual structural factors have an eventual developmental impact on youth's mental health. Further, the impact of structural factors on the mental health of youth may differ depending on the race/ethnicity of the youth, and this is an important avenue of research in order to develop targeted interventions. We expand on previous research by investigating the effects of county-level factors on the mental health of youth involved in the juvenile justice system.

Racial Heterogeneity and Mental Health

A factor generally associated with poorer adolescent mental health is racial heterogeneity (Wickrama & Bryant, 2003; Wickrama, Noh, & Bryant, 2005). Racial heterogeneity quantifies the racial composition or diversity of the community (Wickrama & Bryant, 2003). The concept of racial heterogeneity is important since previous research suggests that perceived race/ethnic identity is an important predictor of experiencing discrimination and psychological distress, both of which can influence an individual's mental health (Meyer, 2003). For example, black (20%) and Hispanic (10%) individuals who reside in a community that is predominantly composed of non-Hispanic white individuals (70%) would experience more distress, possibly due to the

saliency of their race/ethnic identity and greater exposure to instances of racism and discrimination. Conversely, black and Hispanic individuals residing in a racially heterogeneous or diverse community (e.g., 30% non-Hispanic white, 35% black, 35% Hispanic) would be expected to experience less distress. The experience of greater distress could also be true for non-Hispanic whites if they constitute the smallest group in a community comprised primarily of blacks and Hispanics. Along these lines, Krysan and Farley (2002) found that blacks were uncomfortable moving into all white neighborhoods because they perceived such neighborhoods as more hostile and feared greater discrimination. In a later experimental study, Krysan, Couper, Farley, and Forman (2009) showed that independent of social class, blacks found diverse neighborhoods to be the most desirable, followed by all black, and all white neighborhoods. Whites considered all white neighborhoods the most desirable, followed by diverse neighborhoods and all black neighborhoods. The effect of racial composition on neighborhood preferences was stronger amongst whites. However, whites' views of diverse neighborhoods also became increasingly negative as their negative stereotypes of blacks and the neighborhoods they reside in increased (Krysan et al., 2009). Whereas perceived discrimination and in-group identity did not significantly influence the neighborhood preferences of blacks, negative racial stereotyping and in-group identity (particularly positive feelings towards one's own group) significantly influenced preferences for whites (Krysan et al., 2009). Overall, the two studies suggest that blacks may perceive the least distress in diverse neighborhoods, whereas whites would be the least distressed in all white neighborhoods and the effects of diverse neighborhoods would depend on the beliefs that whites have of minorities.

Studies on racial heterogeneity and health have produced mixed results. Greater racial heterogeneity has been associated with poorer physical health in blacks and Hispanics, although

this was partly influenced by less accessibility to recreational spaces (Duncan, Kawachi, White, & Williams, 2013), and increasing ethnic density (towards racial homogeneity) in the absence of neighborhood social cohesion was associated with poorer self-reported overall health and psychological health in Hispanics (Rios, Aiken, & Zautra, 2011). In other studies, after controlling for poverty levels, greater ethnic density was associated with fewer psychological symptomatology and distress among blacks, but not whites (Stafford et al., 2009; Wickrama et al., 2005). These studies demonstrate that the mixed associations between racial heterogeneity and health in racial/ethnic minorities may be confounded by factors that frequently coincide in areas that are ethnically dense, such as concentrated disadvantage, poverty, and crime, especially if the ethnic density is a result of racial/ethnic segregation. Hence it is important to control for these factors when studying racial heterogeneity. The study proposes that once these factors are controlled, greater racial heterogeneity may act as a protective factor against mental illness in minority youth, as living in greater racially/ethnically diverse communities may minimize the salience of race and ethnicity. This could result in reduced race/ethnic discrimination, possibly provide more access to social support networks for minorities, and overall reducing the stress experienced by other factors such as poor socioeconomic status or exposure to crime (Bécares et al., 2012; Rios et al., 2012).

In support of this assumption, a large longitudinal study on adolescents in the general population found racial heterogeneity associated with lower depressive symptomatology in black versus white adolescents after controlling for the effects of community poverty, family poverty, and single-parent families (Wickrama et al., 2005). Moreover, in a study investigating the effects of racial and economic composition and race on substance in adolescents (Cronley, White, Mun, Lee, Finlay, & Loeber, 2012), black male adolescents living in racially mixed middle-income

neighborhoods reported the lowest rates of substance use, and white adolescents living in white, upper-income neighborhoods had the highest rate of substance use. These studies highlight the role of community racial heterogeneity in the development of mental health problems in adolescents. However, little is known of the effects of racial heterogeneity on the mental health problems of youth involved in the juvenile justice system and whether the effects occur at a larger geographic level. This is an important area of research because the primary goal of most interventions with juvenile offenders is to reunify and reintegrate the adolescent into their families and communities that exist within the larger jurisdiction of a county that typically provides the courts and public health services.

The designs of previous research, regardless of the level of analysis (i.e., block, neighborhoods, cities, counties or larger geographic regions) have primarily focused on structural and stratification factors on crime, and physical and mental health outcomes (Hipp, 2007a, 2011; Sampson & Groves, 1989). There are positive and negative aspects of each of these methods. For the purpose of this study, we utilize county wide racial heterogeneity since the juvenile court system, and juvenile detention centers, are county run institutions. Thus, although youth clearly grow up on specific blocks nested within specific neighborhoods and ZIP codes, the juvenile court system operates as a county wide institution. Disproportionate minority contact is associated with county wide variation in the race/ethnicity of the population. Thus, we had to rely on county wide data in calculating racial heterogeneity. If county-level characteristics affect the mental health of the individual, then larger institutional efforts (e.g., educational programs, promoting diversity) should be implemented to reduce racial prejudice and discrimination, and help individuals overcome perceived hostility.

In the current study, the impact of county-level racial heterogeneity on adolescent mental health problems is investigated in a sample of detained youth. Based on previous research, the effects of population density, poverty, and single-parent households on mental health are controlled. The interaction of race of youth on the associations between racial heterogeneity, population density, poverty, and single-parent households with mental health problems is also investigated. Based on previous research, racial heterogeneity is hypothesized to be independently associated with positive outcomes across the sample. Further, it is hypothesized that black and Hispanic detained youth from more racially heterogeneous counties will have more positive mental health outcomes than their white counterparts.

Method

On January 1, 2008, a statewide mental health screening program was initiated in detention centers across a Midwestern state. To assess the effect of this program, data from the mental health screening tool, the Massachusetts Youth Screening Instrument-Version 2 (MAYSI-2; Grisso & Barnum, 2001) were extracted from the juvenile justice system's electronic database. Data for this project were collected from January 1, 2008 to May 1, 2010. During this study period, only 11 of the 22 detention centers across the state were participating in the statewide mental health screening project, and data were only collected from the 11 centers. No data was collected from the other 11 detention centers not participating in the mental health screening project. The university Institutional Review Board approved the study before data collection began.

Participants

Participants included 24,351 detained youth (78.2% Males) between the ages of 11 and 18 ($M = 15.61$; $SD = 1.38$) from eleven of ninety-two counties where the detention centers were

located. The self-reported racial/ethnic composition of the sample was non-Hispanic white (45.6%), black (42.6%), Hispanic (9.6%), and “other” (2.1%). Due to the small size of the “other” group, the “other” group was omitted from all analyses, and the final sample size was 23,831 detained youth. The racial/ethnic categories were defined as non-Hispanic white (46.6%), black (43.5%), and Hispanic (9.8%) for the current study.

Measures

Demographic information. At the time of detention, sex, age, and self-reported race/ethnicity (non-Hispanic white, black, Hispanic, or other) were recorded.

Census data. Several county-wide measures were used in the analyses including the racial fragmentation index (RFI), median household income, percentage of single-parent households, and population density. Racial Heterogeneity is assessed using the RFI, a standard equation used to measure the racial composition of communities (Alesina & La Ferrara, 2002; Costa & Kahn, 2003). The RFI represents the probability that two randomly drawn individuals in a population belong to different races. In the equation below, i indicates the fragmentation index and ranges from 0 (racial homogeneity) to 1 (racial heterogeneity). The k represents each racial category (non-Hispanic white, black, and Hispanic). The term s_{ki} represents the share of race k in the index. Thus, as the RFI increases from 0 to 1, the county’s population is characterized by more racial/ethnic minorities.

$$f_i = 1 - \sum_k s_{ki}^2$$

Median household income was used as a measure of the poverty levels in each county, and the percentage of single-parent households was used as the measure of the number of single-parent families within each county. Population density is a measure of the number of people per square mile within each county.

Mental health screening. All detained youth completed the MAYSI-2 (Grisso & Barnum, 2001), an electronic mental health screening tool created and validated with detained youth. The MAYSI-2 is a mental health screener consisting of seven scales with a total of 52 dichotomous (yes/no) items. The MAYSI-2 is primarily used to identify youth who are presenting with symptoms commonly associated with psychiatric conditions and who might require immediate mental health services. Cronbach's alphas per scale have been reported to range from .61 to .86. The seven scales are alcohol/drug use (e.g., "Have you used alcohol or drugs to make you feel better?"), angry-irritable (e.g., "When you have been mad, have you stayed mad for a long time?"), depressed-anxious (e.g., "Have nervous or worried feelings kept you from doing things you want to do?"), somatic complaints (e.g., "Have you had bad headaches?"), suicide ideation (e.g., "Have you felt like hurting yourself?"), thought disturbance (e.g., "Have you heard voices other people can't hear?"), and traumatic experiences (e.g., "Have you ever seen someone severely injured or killed [in person—not in movies or on TV]?"). The thought disturbance scale of the MAYSI-2 was normed only for males, thus it was not used in the current analyses (Grisso et al., 2012). The following are the Cronbach's alphas for the present study: alcohol/drug use = .84, angry-irritable = .84, depressed-anxious = .76, suicidal ideation = .86, somatic complaints = .75, and traumatic experiences = .66. For the current study, the MAYSI-2 scales were treated as continuous variables and total scores for each scale were used. Higher scores on each scale represented endorsing more problems.

Analyses

Six hierarchical linear regression analyses were conducted in SPSS version 21 to test the independent and interactive effects of the study variables on each of the mental health dependent variables (i.e., alcohol/drug use, angry-irritable, depressed-anxious, somatic complaints, suicidal

ideation, and traumatic experiences). For each regression analysis, age and sex (0 = female, 1 = male) of the participants were entered in Step 1 to control for their effects as they were significantly correlated with the study variables. The categorical 3-level variable race was dummy coded into three separate variables, non-Hispanic white (1 = white, 0 = non-white), Black (1 = black, 0 = non-black), and Hispanic (1 = Hispanic, 0 = non-Hispanic). Only the race variables of black and Hispanic were entered into Step 1. The county-level variables of racial heterogeneity, median household income, percentage of single-parent households, and population density were entered in Step 2. To test if the association between county variables and mental health differed by race, interaction terms between race and each county-level variable were entered in Step 3 (i.e., black X county variable, Hispanic X county variable). Before each interaction variable was created, the continuous county-level variables of racial heterogeneity, median household income, single-parent households, and population density were centered. Because only the black and Hispanic dummy variables and their interactions were entered into the regression analyses, in interpreting a significant interaction, non-Hispanic white youth serve as the reference group in each of the regression analyses.

Results

Table 1 shows the means and standard deviations of the study variables by total sample and race. Table 2 shows the means and standard deviations of the study variables by gender. Table 3 shows the bivariate correlations between the study variables. In terms of mental health, race of youth was significantly negatively correlated with all MAYSI-2 scales. Race of youth was also significantly positively correlated with gender, racial heterogeneity, percentage of single-parent households, and population density, and negatively correlated with median household income (see Table 3). A one-way analysis of variance (ANOVA) was conducted to

test if there were significant mean differences between non-Hispanic white, black, and Hispanic youth on the study variables. The results of the ANOVA indicated that there were significant mean differences for race of the youth on county-level variables, and mental health variables (all $ps < .001$) (see Table 1).

Scheffé's post hoc criterion for significance indicated that on average black youth lived in counties that were characterized by greater racial heterogeneity, higher percentage of single-parent households, and greater population density than Hispanic and non-Hispanic white youth (all $ps < .001$). Similarly, Hispanic youth lived in counties that had greater racial heterogeneity, higher percentage of single-parent households, and greater population density than non-Hispanic white youth (all $ps < .001$). Analyses also indicated that non-Hispanic white youth lived in counties that on average had higher median household incomes than Hispanic and black youth, and Hispanic youth lived in counties that had higher median household incomes than black youth (all $ps < .001$). Post hoc analyses on adolescent mental health indicated that non-Hispanic white youth reported greater mean levels of alcohol/drug use, angry-irritable, somatic complaints, and suicidal ideation than detained Hispanic and black youth (all $ps < .05$). Black youth reported higher mean levels of angry-irritable, depressed-anxious, and traumatic experiences than Hispanic youth (all $ps < .001$). Lastly, Hispanic youth reported more alcohol/drug use problems than black youth ($p < .001$).

According to Table 3, sex was significantly correlated with all MAYSI-2 scales except for alcohol/drug use. Sex was also significantly correlated with age, racial heterogeneity, median household income, percentage of single-parent households, and population density. An ANOVA indicated that compared to females, males on average were older, lived in counties that had greater racial heterogeneity, higher percentage of single-parent households, and greater

population density, and significantly lower median household income (all $ps < .001$) (see Table 2). Compared to males, females reported higher mean levels on all the MAYSI-2 scales with the exception of alcohol/drug use (all $ps < .001$) (see Table 2).

Also shown in Table 3, age was positively and significantly correlated with alcohol/drug use and traumatic experiences. Age was negatively and significantly correlated with all other MAYSI-2 scales.

At the county level, racial heterogeneity was significantly negatively correlated with alcohol/drug use, angry-irritable, somatic complaints, and suicidal ideation. Racial heterogeneity was also significantly positively correlated with traumatic experiences (see Table 3). County median household income was significantly negatively correlated with all MAYSI-2 scales except for alcohol/drug use and somatic complaints. In contrast, median household income was significantly positively correlated with alcohol/drug use. Percentage of single-parent households was significantly negatively correlated with alcohol/drug use, somatic complaints, and suicidal ideation, and significantly positively correlated with depressed-anxious, and traumatic experiences scales of the MAYSI-2 (see Table 3). Lastly, population density was significantly positively correlated with angry-irritable, depressed-anxious, and traumatic experiences, and negatively correlated alcohol/drug use and somatic complaints (see Table 3).

Individual-Level Predictors of Adolescent Mental Health

Results of the hierarchical regression analyses are shown in Table 4. In all separate regressions, the variables median household income and population density had betas that were essentially zero with 95% confidence intervals (CI) from 0.00 to 0.00. Although they were significant, a one standard deviation change in their numbers would have only resulted in very little change (close to zero) in the dependent variables, and thus are uninterpretable.

Subsequently, median household income and population density were removed from all regressions.

At the individual level, there was a significant negative association for male with all MAYSI-2 scales except for alcohol/drug use (all $ps < .001$). There was also a significant main effect for age with all MAYSI-2 scales (all $ps < .01$). Specifically, age was positively associated with alcohol/drug use, and traumatic experiences, (all $ps < .01$), and was negatively associated with angry-irritable, depressed-anxious, somatic complaints, and suicidal ideation, (all $ps < .001$) (see Table 4). After controlling for the effects of age and sex, there were significant main effects for race of the youth. Specifically, black youth was negatively associated with alcohol/drug use, angry-irritable, somatic complaints, suicidal ideation, and traumatic experiences (all $ps < .05$). Hispanic youth was negatively associated with all scales of the MAYSI-2 (all $ps < .01$).

County-Level Predictors of Adolescent Mental Health

In terms of county-level factors, racial heterogeneity was independently negatively associated with each of the MAYSI-2 scales (all $ps < .01$) (see Table 4). Percentage of single-parent households was positively associated with each of the MAYSI-2 scales (all $ps < .01$) (see Table 4).

The Interactive Effect of Race and County Characteristics on Adolescent Mental Health

As shown in Table 4, significant interactions emerged between race of the youth and racial heterogeneity in the prediction of mental health problems. Specifically, the interaction between black youth and racial heterogeneity was significantly negatively associated with alcohol/drug use, $b = -2.91$, $p < .001$, 95% CI [-4.01, -1.81]. Moreover, the Hispanic youth by racial heterogeneity interaction was significantly negatively associated with alcohol/drug use, $b =$

-3.47, $p < .001$, 95% CI [-5.26, -1.68], and positively associated with somatic complaints, $b = 1.56$, $p = .049$, 95% CI [0.01, 3.10].

Table 4 also shows significant race by county-level variable interactions in the prediction of mental health problems. Specifically, black youth by percentage of single-parent households significantly interacted to predict alcohol/drug use, $b = 0.24$, $p < .001$, 95% CI [0.13, 0.36]. Hispanic youth by percentage of single-parent households was associated with alcohol/drug use, $b = 0.26$, $p = .009$, 95% CI [0.07, 0.46], angry-irritable, $b = -0.29$, $p = .028$, 95% CI [-0.54, -0.03], and somatic complaints, $b = -0.21$, $p = .018$, 95% CI [-0.38, -0.04].

Discussion

The present study examined the independent and interactive influence of racial heterogeneity and race on the mental health of detained adolescents. As expected, greater county racial heterogeneity was associated with better overall mental health outcomes across detained youths. This effect remained significant even after controlling for other previously identified factors that contribute to antisocial behaviors, such as percentage of single-parent households. The factors of poverty (i.e., assessed through median household income) and population density that are frequently associated with minority status did not meaningfully contribute information towards mental health symptoms in the models beyond age, gender, race/ethnicity, racial heterogeneity, and percentage of single-parent households. Median household income and population density were then removed from the models.

One explanation for our findings on racial heterogeneity is that heterogeneous populations provide minority youth with greater access to members of their own culture and ethnicity (thus reducing the salience of their minority status and associated impacts on mental health) increasing social cohesion and social support, and offsetting potential stressors (Rios et

al., 2011; Turner 2013). Additionally, studies on non-justice involved youth (i.e., black and Hispanic) have found that across ethnicities, youth in more ethnically diverse classrooms, and youth who have more cross-ethnic friendships report less peer victimization and loneliness, and more safety (Graham, Munniksma, & Juvonen, 2013). Across white, black, Hispanic, and Asian youth, those with more cross-ethnic friendships were also perceived to be more popular and increased leadership skills (Kawabata & Crick, 2008; Lease & Blake, 2005). Further, in studies of non-Hispanic white and black adults, racially mixed or diverse neighborhoods were reported to be the most desirable, and this may influence or increase their positive expectations for a community (Krysan et al., 2009; Krysan & Farley, 2002). More racially heterogeneous and diverse neighborhoods may also foster positive relationships across racial and ethnic groups through better understanding of different cultures and in turn reduce instances of discrimination, negative stereotyping and perceived hostility. Under this supposition, the positive effect of racial heterogeneity on mental health should be stronger for minority youth. Interaction analyses revealed that compared to non-Hispanic white detained youth, black detained youth living in more racially heterogeneous counties experienced fewer alcohol and drug use problems (Figure 1). Similarly, Hispanic detained youth compared to non-Hispanic white detained youth living in more racially heterogeneous counties also reported fewer alcohol and drug use problems. Interestingly, compared to Hispanic detained youth, non-Hispanic white detained youth living in racially heterogeneous counties also reported fewer somatic complaints than when living in racially homogenous neighborhoods (see Figure 1). Thus, consistent with hypotheses, the results of the study suggest that the beneficial effects of county racial heterogeneity were primarily for detained black and Hispanic youth.

Individual Factors

In line with previous research on detained adolescents, non-Hispanic white youth reported more mental health problems than non-white youth (Cauffman, 2004). Also consistent with previous research, females reported greater mental health problems across the MAYSI-2 scales, with the exception of alcohol/drug use, than males (Grisso et al., 2012). Detained females are more likely to present with greater and more severe internalizing (e.g., depression, anxiety) and externalizing disorders (e.g., conduct disorder) than detained males (Cauffman, Piquero, Broidy, Espelage, & Mazerolle, 2004; Cauffman, 2004; Deković, Buist, & Reitz, 2004). Sex discrepancies in the processing of youth in the juvenile justice system may contribute to this difference, where females are less likely to be incarcerated and more likely given formal probation or assigned to other diversion programs than males (Bostwick & Ashley, n.d.), and females who are sent to detention tend to be more deviant and are more likely to have mental health problems than their male counterparts (Espelage et al., 2003).

The study also found greater reports of traumatic experiences and problems with alcohol and drug use in older youth. These associations make conceptual sense, as older youth have had more time and chances to encounter traumatic experiences. Additionally, over time alcohol and drug use may have progressed to affect more domains of a youth's life to cause problems outside of the family, such as in school or work. Alternatively, adolescence is an experimental time for most youth, and alcohol and drug use peak during this stage, increasing the probabilities of developing a problem or experiencing problems due to use (Colder, Campbell, Ruel, Richardson, & Flay, 2002). Interestingly, the results of the study generally point towards greater mental health problems amongst younger detained youth, especially for anger and irritability. This is consistent with developmental research on antisocial behaviors. Individuals who present with conduct problems in childhood are more likely to have neurocognitive issues, poor behavioral

control, and experience subpar parenting, whereas individuals with adolescent-onset conduct problems are less likely to have these adverse backgrounds (Moffitt & Caspi, 2001).

County Factors

Consistent with previous research on youth in the general population (Wickrama et al., 2005), correlations suggested that detained youth from poor, densely populated counties experience more overall mental health problems. Further regression analyses indicated that detained youth from counties with greater percentages of single-parent households reported significantly more problems across all the MAYSI-2 scales. Although not specifically assessed, these findings point to the influence of such factors as lack of community resources and services, community overcrowding, and parental resources to effectively monitor youth on the development of antisocial behaviors and mental health. These factors have been previously identified to contribute to greater community social disorganization and higher crime rates (Kubrin & Weitzer, 2003; Ludwig, Duncan, & Hirschfield, 2001).

Investigations into the significant interactions between race of youth and percentage of single-parent households residing in a county are shown in Figure 2. Generally, non-Hispanic white youth report greater levels of alcohol and drug use, angry-irritable, and somatic complaints, than black and Hispanic detained youth (refer Table 1). The effect of living in counties with greater percentages of single-parent households appears stronger for Hispanic and black detained youth than non-Hispanic white detained youth on problems of alcohol and drug use. Specifically, although non-Hispanic white youth still report greater problems with alcohol and drug use, a greater increase in alcohol and drug use problems are reported by Hispanic and black youth living in counties that have more single-parent households than those living in counties with fewer single-parent households. Similarly, the effect of living in counties with

higher percentages of single-parent households was associated with greater rates of angry-irritable problems and somatic complaints among non-Hispanic white and Hispanic detained youth compared to those that live in areas with lower percentages of single-parent households. Further, this association was stronger in non-Hispanic white youth, observed by the sharper increase and reports of significantly more problems than Hispanic youth (Figure 2). The stronger effect of residing in areas with greater concentrations of single-parent households for non-Hispanic white youth could be associated with the effect of living in greater poverty (typically single-parent families have lower incomes than non-single-parent households). The greater economic hardships experienced by single-parent households has an emotional and psychological toll on both parents and their children and also affects their ability to access quality medical care, food, clothes, and recreational activities. For example, Wickrama et al. (2005) generally found that the effects of community poverty and adversity was stronger for black adolescents in poor families than non-poor families. However, at a smaller level, Wickrama et al. found that the negative influence of family poverty on adolescent distress was stronger for white adolescents than black adolescents.

Limitations

Although there were many significant findings in the present study, the effect sizes were small and interpretations should be made with caution. However, given the design of the study, such small effects are expected: associations between individual-level outcomes and county-wide predictors are necessarily limited by differences in measurement and mismatched specificity. The trade-off is that county variables come from large samples, empowering the study to detect relatively small effects.

Another limitation of this study is that racial heterogeneity was measured at the county level, rather than the community level. As the racial heterogeneity of specific communities within counties can vary, our results may not generalize to the census level. Because our study suggests racial heterogeneity may be an important protective factor against mental illness in youth, particularly in the area of alcohol and drug use, neighborhood-level replication of our findings in both detained and non-detained youth should be a focus of future research. The study focused only on a detained population of youth who evidence very high rates of mental health problems, for which the protective effects of county racial heterogeneity may not be clearly evident and limits its generalizability to other youth in the community. It should also be noted that our measure of racial heterogeneity was derived from calculating the composition of three groups (non-Hispanic white, black, Hispanic) within counties. There are other groups living within the community, however, the youth who identified as other racial/ethnic groups were very small (approximately 2%) and were omitted from analyses.

Lastly, the measure used to assess mental health symptoms, the MAYSI-2, is a screening instrument, not a diagnostic tool for mental disorders. Although it cannot definitively determine whether a youth is experiencing a mental health or substance use disorder, it does help identify youth experiencing significant problems in several behavioral health domains that help alert others to make further inquiries in the areas of concern. Future research should include other measures of behavioral health to supplement information. For example, the trauma experiences scale of the MAYSI-2 is not the best instrument to assess direct victimization. Many youth in the juvenile offender population are direct victims of violence and abuse, and oftentimes the victimization that they experience plays the role of both precursor and maintainer of externalizing and internalizing pathology.

Conclusions and Implications

Previously, factors such as race, and racial heterogeneity were assumed to have a negative impact on the mental health of developing youth. However, these associations are often complex because race and racial heterogeneity were often associated with other social stratification factors such as social economic status, racial segregation, and population density. The present study goes beyond individual-level race factors and demonstrates that county-level factors have an effect on mental health. Specifically, this study highlights county racial heterogeneity as a protective factor against developing mental health problems amongst detained adolescents. The results of our study emphasize the importance of studying county factors, and could guide future intervention efforts with youth. For instance, in the case of juvenile offenders, steps have been taken to improve their physical and mental health by county-wide efforts to limit the detention of low-risk youth. The Annie E. Casey Foundation's Juvenile Detention Alternatives Initiative (JDAI) is a nationwide movement that has been adopted by almost 300 counties across the United States to reallocate government resources toward investment in youth, families, and communities, and away from mass incarceration (Annie E. Casey Foundation, 2013). JDAI has been effective in improving public safety, and reducing juvenile offending, disproportionate minority contact and racial/ethnic health disparities among youth in counties where it is implemented. Another example is the application of state-wide mental health screenings for juvenile offenders to improve the detection of mental health problems and access to appropriate care. Detention centers vary demographically and geographically dependent on the counties within which they serve, and these factors can influence how mental health is viewed and reported, as well as the type and quality of services available (e.g., Aalsma et al., 2014). Because initiatives like the JDAI and mental health screening are executed county by county, it

is important to understand the area and participating organizations for which these measures are implemented.

Based on the results of previous work and the present study, programs that promote racial and cultural diversity would be beneficial to the physical and mental health of youth. This can be implemented by improving the availability of prosocial community resources (e.g., recreational centers, community events) that foster social cohesion and positive interactions between racially and ethnically diverse individuals. The opportunities for positive interactions and experiences may in turn encourage positive cross-ethnic relationships and partnerships that help reduce the negative stereotypes people have of others from different backgrounds, and decrease experienced and perceived hostility and discrimination. Thus, residing in racially heterogeneous and diverse counties may protect youth against the development of mental health problems that may put them at-risk to be involved in the juvenile justice system if appropriate measures and resources are in place.

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