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The Effects of Incarceration on Depression and Anxiety in Juveniles

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THE EFFECTS OF INCARCERATION ON DEPRESSION AND ANXIETY IN
JUVENILES

by
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A thesis submitted in partial fulfillment of the requirements for the Honors in the Major Program
in Criminal Justice in the College of Community Innovation and Education
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at the University of Central Florida
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Abstract

Adolescents within the juvenile system suffer from a multitude of physical and mental health issues. Previous studies have linked incarceration to poor health in juveniles, but very few have been able to claim incarceration is the cause for the mental health issues found in incarcerated juveniles. Whether juveniles go into the system with pre-existing mental health disorders or not, still many factors are associated with the development of mental disorders while incarcerated. Based on what the field knows and does not know about the link between juvenile incarceration and mental health, the goal of this study was to determine if incarceration is directly associated with increases in depression and anxiety among incarcerated juveniles. To explore this issue further, I conducted a study that investigates the relationship using data from the Pathways to Desistance Study. The results of the study established a clear causal ordering between mental health and incarceration demonstrating that mental health appears to deteriorate during incarceration and improve after release. This study can aid in the reform of juvenile detention as mental health programs can be developed in order to assist incarcerated adolescents.

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Chapter 1: Introduction

The juvenile justice system was established during the nineteenth century to create a rehabilitative approach to prevent future crimes (Powel, 2014). Throughout the decades, it has become more and more like the adult criminal justice system by concentrating on punishment over rehabilitation. This information is important because punishment in the form of incarceration may have significant negative effects on the mental health of juveniles.

Adolescents within the juvenile system suffer from a multitude of physical and mental health issues. Previous studies have linked incarceration to poor health in juveniles, but very few have been able to claim incarceration is the cause for the mental health issues found in incarcerated juveniles (Kashani et al., 1980; White et al., 2010). In comparison to the general population, 35-80% of imprisoned adolescents suffer from mental health disorders compared to 9-18% of the general adolescent population (Mallett, 2015). Detained youth have suffered a higher rate of mental illnesses in comparison to adolescents without justice system involvement, particularly regarding anxiety and depression (Cauffman et al., 2005). To date, researchers have only been able to link mental health issues in adolescents to imprisonment. However, the temporal ordering of the association is unclear because prior research has yet to employ methods that establish this crucial component of causality. Thus, this raises the question: does incarceration negatively affect mental health, or are individuals suffering from mental health challenges more likely to engage in crime and be incarcerated or possibly both?

Whether juveniles go into the system with pre-existing mental health disorders or not, still many factors are associated with the development of mental disorders while incarcerated. Youth are subjected to many stressors, including bullying, maltreatment, substance use, and

separation from their families and known environments (Kenny & Ashkar, 2008; Powel, 2014). These stressors may have been the cause of higher rates of mental health issues amongst the population of incarcerated adolescents (Kenny & Ashkar, 2008; Powel, 2014).

Studies have found that adolescents demonstrate higher rates of depression than non-incarcerated adolescents (Grisso et al., 2005; Ng et al., 2011). However, due to the lack of mental health testing administered to juveniles entering the system, determining if juveniles have already had an existing mental health disorder or if the system aided in developing an illness is challenging. Existing research has not provided much evidence of incarceration leading to depression and anxiety, except for a few, including Kashani et al. (1980). In the study, Kashani and colleagues investigated 18 depressed delinquents, with 7 developing depression while incarcerated. Out of these 18 total, 5 were released and re-evaluated, resulting in reduced levels of depression, which overall would mean that depression could stem from incarceration (Ng et al., 2011). However, one cannot come to this conclusion based on one study. There is a need for more evidence to conclude that mental health indeed does stem from incarceration.

Many health factors affect adolescents apart from their mental health. These issues that juveniles face while being imprisoned not only affect them during their time in the juvenile center but also after they are released: "A large proportion of incarcerated youth suffer from mental health problems, such depression, suicide attempts, and ideation, as well as drug and alcohol abuse" (Lambie & Randell, 2013, p. 453).

Considering what the field has learned and has yet to learn about the link between juvenile incarceration and mental health, the goal of this study is to determine if incarceration is directly associated with increases in depression and anxiety among incarcerated juveniles. To

explore this issue further, I conducted a study that investigates the relationship using existing data from the Pathways to Desistance Study. Prior to discussing results and the current study, I will briefly review the related literature on juvenile incarceration, depression, and anxiety.

Chapter Two: Literature Review

Few studies have directly studied incarceration as a cause of mental health issues in incarcerated adolescents. One of these studies is Kashani et al. (1980); they studied if incarceration could affect the development of depression. They studied 100 boys and girls admitted throughout a seven-month period to the Juvenile Justice Center (JJC). Adolescents younger than 17 were placed in the center for evaluation and detention (Kashani et al., 1980).

The authors conducted a semi-structured interview a week after the juveniles arrived at the JJC (Kashani et al., 1980). To diagnose the incarcerated adolescents, symptoms of major depressive disorder must have been present for at least a week: symptoms that they must have experienced are “disturbance of appetite or weight, sleep difficulties, fatigue, psychomotor agitation, loss of interest or pleasure, self-approach or excessive guilt, difficulty in thinking or concentrating, and recurrent thoughts of death and suicide” (Kashani et al., 1980, p. 187). A psychiatrist used the DSM-III diagnostic criteria for major depressive episodes to provide a diagnosis (Kashani et al., 1980). The authors also studied 50 non-incarcerated, non-delinquent adolescents from a family practice clinic: 32 boys and 18 girls (mean age 14.9).

Out of the 100 delinquent juveniles, 71 boys and 29 girls were admitted to JJC, ranging in age from 11 to 17 years old (mean 14.6). Of the delinquents, 18 (10 girls and 8 boys) exhibited a major depressive episode according to the DSM-III diagnostic criteria (Kashani et al., 1980).

Changes in appetite seemed to be the most prominent symptom noted very frequently amongst the depressed group (94%) (Kashani et al., 1980). Agitation was the least reported

symptom, which was only present in three individuals (16%). However, it is worth noting that 100% of the depressed delinquents reported sleep disturbances (Kashani et al., 1980).

The frequency noted by multiple symptoms differed amongst the group of depressed delinquents and nondepressed delinquents. An example of this would be the frequency of sleep disturbances among the depressed was 100%, the symptoms of self-reproach or guilt were 44% (Kashani et al., 1980). As reported in Table 2 of the study, (Kashani et al., 1980) comparing the nondepressed incarcerated adolescents to the non-incarcerated, non-delinquent adolescents, fewer sleep disturbances (14%) and more self-reproach or excessive guilt (16%) were observed and coded (Kashani et al., 1980). When comparing the nondelinquent to the incarcerated delinquents, 18% of these adolescents met the criteria, which is a significant difference ($p < 0.02$) (Kashani et al., 1980).

To gain the most accurate results, the researchers asked the delinquent adolescents to report their symptoms before and after their admission (Kashani et al., 1980). Out of the 18 with major depression, 7 failed to document full depressive symptoms before admission to JJC, so the authors determined that the adolescents developed depression after incarceration. The remaining 11 delinquent adolescents reported that they had depressive symptoms present before they were incarcerated.

Kashani and colleagues study showed a prevalence of depression amongst 18% of incarcerated delinquents when compared to 4% among non-delinquent, non-incarcerated adolescents. The prevalence of depression also differed when they compared sexes: delinquent girls were approximately three times more likely to suffer from depression than that seen in boys. They concluded that incarceration may lead to situational depression due to stressful factors (Kashani et al., 1980).

A more recent study conducted by White et al. (2010) examined the association between mental health and incarceration which yielded different results from Kashani et al.'s study in 1980. In this study, the authors examined if incarceration increases levels of depression and anxiety amongst male adolescents. Their methods consist of using group-based trajectory analysis and in conjunction with this approach, they also incorporated propensity score matching procedure (White et al., 2010).

White and colleagues (2010) tested whether incarceration increases levels of depression and anxiety amongst male adolescents in their study. Delinquent juvenile's levels of mental health illnesses were compared to the levels of mental health disorders found in those who have never been incarcerated during their adolescence (White et al., 2010). The treatment group consisted of youth placed in custody at the age of 15 (now 16). The control group consisted of boys who had no official arrest record or confinement during adolescence (White et al., 2010). They gathered their data as part of the Pittsburgh Youth Study (PYS) (Loeber et al., 2008). The PYS is a "prospective longitudinal study of the development of delinquency, substance use, and mental health problems" (White et al., 2010, p. 298). Data for the study was collected from random samples of first and seventh-grade boys enrolled in the City of Pittsburgh public schools. Eight-hundred and fifty boys in each grade were screened ("85% of the target sample") (White et al., 2010, p. 298). The boys were followed up with at 6-month intervals during the first three years of the study, and then the assessments were conducted annually (White et al., 2010). Of the 1,009 youths, only 62 were confined at age 15 (White et al., 2010). The treatment group retained 49 youths after removing anyone who had missing values for the outcome variables (White et al., 2010). From the control youth, they removed boys who had an official

juvenile arrest or an unclear detention history leaving them with 461 young men (White et al., 2010). Overall, 510 males were analyzed for the study.

To assess the mental health issues in the male adolescents, they used the Child Behavior Checklist (CBCL) and the Youth Self-Report (YSR) completed by the participants (Achenbach, 1991). Two Diagnostic and Statistical Manual of Mental Disorders (DSM)-oriented subscales for the CBCL and YSR were also used in the study (White et al., 2010). The researchers investigated specific symptoms that would indicate depression or anxiety; for depression, they looked for signs of crying, not eating well, feeling of worthlessness, and feeling too guilty, and for anxiety, they looked for dependency, fears, and nervousness (White et al., 2010). After gathering the scores for the CBCL and the YSR, they combined both to create an affective depression and anxiety problem scale. The correlation found between the levels of depression and anxiety was .67 at the age of 14 (White et al., 2010).

Results indicated no significant difference between the confined and control groups in levels of depression and anxiety (White et al., 2010). It is worth noting that those adolescents who were first confined at age 15, but interviewed at age 16 after their release reported statistically nonsignificant, lower levels of depression than the adolescents who had never been incarcerated (White et al., 2010). However, it can be noted that adolescents “who were interviewed during confinement reported higher (although not statistically significantly) levels of depression and anxiety than their previously confined peers interviewed on the outside” ($d = .251$ and $d = .217$) (White et al., 2010, p. 305).

Other literature examined the association between incarceration and mental health issues amongst adolescents (Domalanta et al., 2003; Lambie & Randell, 2013; Robertson et al., 2004) and how incarcerated adolescents differ from the general population (Thomas & Penn, 2002). A

study conducted in the early 2000's indicated that higher levels of mental health issues can be noted from incarcerated adolescents compared to the general population (Thomas & Penn, 2002). Mental health issues are very rarely identified as the adolescents enter the system, as well as assessed while they are in the system (Lambie & Randell, 2013). Adolescents with already pre-existing mental health disorders can increase the risk of them engaging in more impulsive and aggressive behaviors which would increase the likelihood of entering the juvenile justice system (Grisso, 2008). For youth who are already within the system, stressors can also contribute to worsening pre-existing mental health conditions or developing new ones. When adolescents go into the justice system, they are separated from family and must learn how to adapt to a different lifestyle (Lambie & Randell, 2013). Stressors encountered include boredom, bullying, and victimization (Greve, 2001; Lambie & Randell, 2013).

Research conducted by Brown and Ireland (2006) focused on the coping style and distress in 133 male adolescent prisoners during two occasions over the six-week period shortly after incarceration. They found significant decreases in anxiety and depression during the six-week period following incarceration (Brown & Ireland, 2006). The decrease in anxiety and depression could be due to the incarcerated youth developing more adaptive strategies to their environment (Lambie & Randell, 2013).

A study conducted by Shulman and Cauffman (2011) yielded similar results as Brown and Ireland (2006). They found that symptoms of mental health issues in adolescents declined over the first month of incarceration (Shulman & Cauffman, 2011). In both studies, the youth were sent to Juvenile Justice Facilities, which only houses juveniles (Shulman & Cauffman, 2011). However, other studies suggest that these levels of mental health issues vary depending on where the juveniles are confined (Ng et al., 2011). For example, a study conducted by Ng et al.

(2011) found that youth offenders housed in adult prisons had a negative effect on their mental health than those in juvenile placements and community-based youth (Ng et al., 2011). The negative effect on their mental health can be due to “heightened levels of stress and potential threat” that they undergo while attempting to integrate with the prison population (Lambie & Randell, 2013).

Given the literature reviewed for this thesis, one cannot conclude that incarceration does cause mental health illnesses in confined adolescents. Many have shown data supporting this notion; however, recent research has not found data significant enough to support this statement (Kashani et al., 1980; White et al., 2010). A multitude of factors may also impact incarceration being correlated with negative mental health issues in juveniles. Other factors may impact mental health illness in incarceration, such as the conditions in which they are housed, pre-existing mental health disorders causing them to commit crime, or managing and adapting to the new environment (Brown & Ireland, 2006; Domalanta et al., 2003; Lambie & Randell, 2013; Lambie & Randell, 2013; Robertson et al., 2004; Shulman & Cauffman, 2011; Thomas & Penn, 2005).

Chapter Three: Current Study and Data

Based on the prior literature, questions remain about the association between adolescent incarceration and depression and anxiety. The goal of the current study was to begin answering these questions. Specifically, I worked to determine if incarceration increases depression and anxiety in adolescents. To explore this, I used existing data from the Pathways to Desistance Study (Mulvey, 2016). The Pathways Study is a longitudinal study of adolescent offenders as they transition into early adulthood. From the juvenile and adult court systems in Maricopa County (Phoenix), Arizona and Philadelphia County, Pennsylvania, 1,354 adjudicated adolescents (who were at least 14 years old, but under 18 years of age) were enrolled in the study from November 2000 to January 2003. Each participant was followed for a period of seven years. Some adolescents at the end of the study had already been approaching early adulthood. The purpose of this study was to identify the pathways out of the juvenile system and the individual characteristics of the adolescents as they do so. In addition, this study aimed to observe the impact of different sanctions on juvenile's mental health, behavior, social development, psychological development, and experiences in the juvenile or criminal justice system.

While exploring the impact of incarceration on depression and anxiety, I controlled for several other factors that have been linked to these mental health outcomes. Among the most important factors that have been linked to changes in depression and anxiety include community involvement/physical activity (MacMahon, 1990), exposure to violence (Stansfeld et al., 2017), and substance use (Gillen et al., 2016).

Physical activity has been linked to decreasing symptoms of depression (MacMahon, 1990). Data has shown that exercise results in a positive mood effect for those juvenile

delinquents who take part in the exercise (MacMahon, 1990). Higher levels of fitness have been linked to releasing endorphins from the brain resulting in higher levels of happiness for the individual (Dfarhud et al., 2014). As such, involvement in community activities such as sports teams, scouts, and volunteer groups were also considered in the study.

Exposure to violence is another potential factor that can affect depression and anxiety, according to Stansfeld et al. (2017). The adolescent could have been a witness or a victim of violence; examples of this could be sexual attacks, fights, and attacks with a weapon which in turn can lead to the development of mental health issues (Stansfeld et al., 2017). An adolescent may resort to substance use (alcohol, illegal drugs, and smoking), if they already suffer from mental health issues to relieve the symptoms they are experiencing (Cuellar et al., 2004). Adolescents can also become involved with alcohol or drugs and then develop mental health issues as a result. Substance use can potentially lead to social consequences and dependency problems that can, in turn, lead to incarceration (Cuellar et al., 2004).

In sum, the current study aims to answer the following research questions:

1. Is there a relationship between incarceration, depression, and anxiety?
2. Does an association exist between incarceration, depression, and anxiety after controlling for other factors associated with depression and anxiety?
3. Do those adolescents who experience incarceration also experience increases in depression and anxiety, or both?

In this study, the independent variable is incarceration, and the dependent variables are depression and anxiety. There were other variables that could have affected anxiety and

depression but were controlled for such as community involvement, substance use, exposure to violence (witness plus victim), age, ethnicity, and sex.

Incarceration was measured by the time-period, baseline and follow up, and the location that the adolescents were in (e.g. the community, a treatment center, secure confinement, jail/prison, or detention). These variables were then recoded into different variables to see if these adolescents were either incarcerated or in treatment (e.g. Incarcerated at Baseline Only, Incarcerated at Follow Up Only, Incarcerated at Both Time Periods, In Residential Treatment at Baseline Only, In Residential Treatment at Follow Up Only, In Residential Treatment at Both Time Periods, or Never Incarcerated nor in Treatment). Depression was measured using the Brief Symptom Inventory (BSI) which is a self-report inventory containing 9-items in which participants rate to the extent they have been bothered in the past week by different symptoms (0 = “not at all” , 4 = “extremely”). Anxiety was also measured using the Brief Symptom Inventory which contained 9-items in which participants are able to rate to the extent they have been bothered within the past 7 days by symptoms.

The researchers used the *Exposure to Violence (ETV) Inventory* (Selner-O'Hagan, Kindlon, Buka, Raudenbush, & Earls, 1998) which was modified for the Pathways to Desistance study to account for the frequency of exposure to violent events (Mulvey, 2016). Items from inventory included: the types of violence the adolescent has both experienced (i.e., Victim - 6 items, e.g., "Have you ever been chased where you thought you might be seriously hurt?") and observed (i.e., Witnessed - 7 items, e.g., "Have you ever seen someone else being raped, an attempt made to rape someone or any other type of sexual attack?"). In addition to these items, there are four questions that ask about the adolescent's exposure to death (e.g., has anyone close to you tried to kill him/herself, has anyone close to you died, have you ever found a dead body, have you ever

tried to kill yourself). Finally, one open-ended item takes into account the involvement in other types of situations that could have potentially led to death or serious injury. Overall, the ETV scale inquiries about seventeen different types of situations so scores for this measure could range from 0 to 17.

The *Substance Use/Abuse Inventory* was a modified version of a substance use measure developed by Chassin et al. (1991). This measure takes into consideration the adolescents use of illegal drugs and alcohol over the course of their lifetime and in the past six-months. This self-report measure is divided into two subscales: Substance Use (e.g., "How often have you had alcohol to drink?") and Social Consequences, Dependency & Treatment (e.g., "Have you ever had problems or arguments with family or friends before because of your alcohol or drug use?"/ "Have you ever wanted a drink or drugs so badly that you could not think of about anything else?"). The range of scores for this inventory were 0 to 49.

The *Community Involvement Scale* (Elliot, 1990) was modified for the Pathways to Desistance Study in order to assess the involvement of the adolescent in community activities. The scores indicate the extent of the adolescent's involvement in four different community organizations: sports teams, scouts, church related groups, and volunteer work. The scores range from 0 to 4, meaning the higher the score, the higher the adolescent was involved in community activities during the past six months.

The demographics (age, ethnicity, and sex) measured in this study were self-reported. For ethnicity, there were four ethnic groups when recoded: White, Black, Hispanic, or Other. Regarding sex, there were two choices that the participants self-reported: male or female. Each

participant's age was calculated by subtracting the subject's date of birth by the interview date then truncated to a whole number.

Chapter Four: Results

The following research questions provided the focus for this study:

1. Is there a relationship between incarceration, depression, and anxiety?
2. Does an association exist between incarceration, depression, and anxiety after controlling for other factors associated with depression and anxiety?
3. Do those adolescents who experience incarceration also experience increases in depression and anxiety, or both?

Ordinary Least Squares Regression (OLS) was used to measure the effect of incarceration on depression and anxiety in adolescents. Important factors that could influence depression and anxiety were controlled for such as community involvement/physical activity, exposure to violence, and substance use. When controlling for these factors, it was discovered that when community involvement was removed, a great deal of cases from the sample were lost, and as a result community involvement was not included in the analyses. However, tables including the community involvement variable can be found in the Appendices.

A correlation matrix was also used to see the association among incarceration, depression, and anxiety. Follow up incarceration was found to have a negative association with baseline depression, baseline anxiety, and follow up anxiety, but a significant positive association with follow up depression ($p < .05$). This association is significant because it showcases how being incarcerated increases levels of depression. Furthermore, when the incarcerated juveniles are released, those levels of depression decrease, which was the result in studies such as Kashani et al. (1980) and White et al. (2010). Incarcerated at both time periods

also proved to be positively associated with baseline depression, baseline anxiety, follow up depression, and follow up anxiety.

Multiple significant relationships were found when determining if incarceration had an effect on depression. As seen in Table 1, prior depression is significantly and positively associated with follow up depression ($b = 0.393$, $SE = 0.023$; $p < .001$). More specifically, a one-unit increase in depression at baseline is associated with a .393 increase in depression at follow up. As seen in Table 1, females also had a significant negative association ($b = -0.173$, $SE = 0.049$; $p < .001$), and lastly, prior six-month substance use had a significant positive association ($b = 0.045$, $SE = 0.015$; $p < .01$). Adolescents who were in treatment at both baseline and follow up ($b = 0.147$, $SE = 0.062$; $p < .05$), and who were only in treatment at follow up ($b = 0.285$, $SE = 0.092$; $p < .01$) also showed significant levels of depression which is expected to see as they had to suffer from a mental disorder in order to be placed in treatment. All three variables of incarceration, (a) only incarcerated at baseline ($b = -0.159$, $SE = 0.059$; $p < .01$), (b) only incarcerated at follow up ($b = 0.244$, $SE = 0.07$; $p < .001$), and (c) incarcerated at both time periods ($b = 0.123$, $SE = 0.046$; $p < .01$), were each shown to be significant predictors of depression. No other variables yielded statistically significant findings that could have been correlated with depression (e.g., age, ethnicity, exposure to violence, treatment only at baseline, treatment at baseline but incarcerated at follow up, and incarcerated at baseline but treatment in follow up).

Table 1: Effect of Incarceration on Depression (n = 1031) is measured without the variable of Community Involvement.

	b	Std. Error	B
Baseline - Depression	0.393***	0.023	0.473
Age	0.016	0.015	0.029
White	0.048	0.043	0.031
Male	-0.173***	0.049	-0.095
Prior Six-Months Exposure to violence (witness plus victim)	0.011	0.009	0.033
Prior Six-Months Substance Use	0.045**	0.015	0.091
Baseline - Only Treatment	-0.085	0.125	-0.022
Follow Up - Only Treatment	0.285**	0.092	0.131
Treatment at Both (Baseline & Follow Up)	0.147*	0.062	0.069
Baseline - Only Incarcerated	-0.159**	0.059	-0.092
Follow Up - Only Incarcerated	0.244***	0.070	0.104
Incarcerated at Both (Baseline & Follow Up)	0.123**	0.046	0.083
Treatment at Baseline but Incarcerated at Follow Up	-0.043	0.220	-0.007
Incarcerated at Baseline but Treatment in Follow Up	0.043	0.127	0.016

B - Standardized

b - Unstandardized

*p <.05, **p <.01, ***p <.001

Several factors were shown to be significant when determining if incarceration had an effect on anxiety. As seen in Table 2, prior anxiety is significantly and positively associated with follow up anxiety ($b = 0.309$, $SE = 0.024$; $p < .001$). Specifically, a one-unit increase in anxiety at baseline is associated with a .309 increase in anxiety at follow up. In Table 2, other variables were also found to have a significant negative association such as female ($b = -0.114$, $SE = 0.045$; $p < .05$), white ($b = 0.078$, $SE = 0.039$; $p < .05$), and prior six-month substance use ($b = 0.056$, $SE = 0.013$; $p < .001$). In addition, age, exposure to violence, treatment only at baseline and only at follow up, treatment at both times, incarcerated only at baseline and only at follow up, incarcerated at both times, treatment at baseline but incarcerated at follow up, and incarcerated at baseline but treatment in follow up, had no statistically significant effect on anxiety at follow up.

Table 2: Effect of Incarceration on Anxiety (n = 1031) is measured without the variable of Community Involvement.

	b	Std. Error	B
Baseline - Anxiety	0.309***	0.024	0.375
Age	0.001	0.013	0.002
White	0.078*	0.039	0.059
Male	-0.114*	0.045	-0.074
Prior Six-Months Exposure to violence (witness plus victim)	0.016	0.008	0.060
Prior Six-Months Substance Use	0.056***	0.013	0.133
Baseline - Only Treatment	0.014	0.113	0.004
Follow Up - Only Treatment	0.126	0.084	0.069
Treatment at Both (Baseline & Follow Up)	0.067	0.055	0.037
Baseline - Only Incarcerated	-0.034	0.053	-0.024
Follow Up - Only Incarcerated	-0.035	0.063	-0.018
Incarcerated at Both (Baseline & Follow Up)	0.041	0.041	0.033
Treatment at Baseline but Incarcerated at Follow Up	0.026	0.198	0.005
Incarcerated at Baseline but Treatment in Follow Up	-0.047	0.115	-0.020

B - Standardized

b - Unstandardized

*p <.05, **p <.01, ***p <.001

Chapter Five: Discussion

The purpose of this study was to gain a better understanding of the relationship between incarceration, depression, and anxiety. There are a few key findings of the present research. First, with depression, the current study concluded that those adolescents who have been incarcerated suffer a higher level of depression. However, this current study cannot conclude that incarceration is associated with anxiety. Second, after controlling for factors like community involvement, substance use, age, sex, ethnicity, exposure to violence, and prior levels of depression, significant results were found in the association between all three variables of incarceration and depression. Third, adolescents who experience incarceration also experience increases in depression, but not anxiety.

Prior literature has concluded that during confinement adolescents report higher levels of anxiety and depression than the adolescents who were confined and then released (Ng et al., 2011; White et al., 2010, p. 305). These prior studies can serve as additional evidence when looking at the results of this study, as there was a statistically significant negative effect of baseline incarceration on follow up mental health. Another study conducted by Brown and Ireland (2006), also determined that levels of depression and anxiety do significantly decrease post incarceration. This could be due to the incarcerated adolescents being able to adapt to their environment (Lambie & Randell, 2013). Whereas past researchers have found that incarceration may or may not have been the leading factor in causing the mental health disorders present in juveniles (Brown & Ireland, 2006; Kashani et al., 1980; Ng et al., 2011; White et al., 2010), the present study has gone beyond that by establishing a clear causal ordering between mental health

and incarceration demonstrating that mental health appears to deteriorate during incarceration and improve after release. The results strongly imply that incarceration causes an increase in depression among adolescents.

Limitations and Future Research

Although the present study's results clearly support that incarceration is associated with mental health issues in adolescents, it is appropriate to recognize several potential limitations. These limitations include having to use an already existing data set as opposed to collecting original current data, not having another group such as juveniles that were in probation as opposed to incarceration in order to compare the two, and not having a measure prior to baseline incarceration that can provide data on depression and anxiety.

In terms of future research, it would be useful to extend the current findings by having two groups of individuals who are randomly assigned: one to probation and the other incarceration. This would be another way to determine if incarceration is the cause of their mental health disorders. This type of random assignment would not only help to determine the relationship between mental health and punishment but could also demonstrate alternatives to incarceration that may be more beneficial to juveniles. Another recommendation for future research would be to have a measure of depression and anxiety prior to baseline incarceration. This would aid in determining the adolescent's mental health before being incarcerated for the first time.

Despite these limitations, the present study has enhanced the profession's understanding of the relationship between incarceration, depression, and anxiety. The results gathered can be a future aid in the reform of juvenile incarceration. It can also serve to spark the interest of other

researchers interested in similar fields of study to conduct research on the effect of incarceration on the mental health of juveniles.

In summation, it can also be said that adolescents experiencing incarceration exhibit increases in depression. After release, depression is shown to dissipate. Although similar results were not found for anxiety, hopefully this study provides a framework for future research.

Appendix A: Depression

Table 3: Effect of Incarceration on Depression (n = 637) including the Community Involvement variable.

	b	Std. Error	B
Baseline - Depression	0.421***	0.031	0.466
Age	0.014	0.018	0.025
White	0.078	0.048	0.056
Male	-0.101	0.052	-0.066
Prior Six-Months Community Involvement	0.061	0.034	0.062
Prior Six-Months Exposure to violence (witness plus victim)	-0.001	0.010	-0.003
Prior Six-Months Substance Use	0.046**	0.016	0.112
Baseline - Only Treatment	-0.074	0.122	-0.023
Follow Up - Only Treatment	0.247*	0.096	0.094
Treatment at Both (Baseline & Follow Up)	0.020	0.293	0.002
Baseline - Only Incarcerated	-0.167**	0.059	-0.100
Follow Up - Only Incarcerated	0.277***	0.070	0.140
Incarcerated at Both (Baseline & Follow Up)	0.214*	0.084	0.089
Treatment at Baseline but Incarcerated at Follow Up	-0.079	0.264	-0.011
Incarcerated at Baseline but Treatment in Follow Up	-0.008	0.251	-0.001

B - Standardized

b - Unstandardized

*p <.05, **p <.01, ***p <.001

Table 4: Descriptive Statistics for Depression (n = 637) including the Community Involvement variable.

	Mean	Std. Deviation	N
Follow Up - Depression	0.41	0.61	637
Baseline - Depression	0.52	0.67	637
Age	15.91	1.12	637
White	0.25	0.43	637
Male	0.81	0.40	637
Prior Six-Months Community Involvement	0.34	0.62	637
Prior Six-Months Exposure to violence (witness plus victim)	1.75	2.19	637
Prior Six-Months Substance Use	0.94	1.46	637
Baseline - Only Treatment	0.04	0.19	637
Follow Up - Only Treatment	0.06	0.23	637
Treatment at Both (Baseline & Follow Up)	0.00	0.07	637
Baseline - Only Incarcerated	0.16	0.36	637
Follow Up - Only Incarcerated	0.11	0.31	637
Incarcerated at Both (Baseline & Follow Up)	0.07	0.25	637
Treatment at Baseline but Incarcerated at Follow Up	0.01	0.09	637
Incarcerated at Baseline but Treatment in Follow Up	0.01	0.09	637

Table 5: Descriptive Statistics for Depression (n = 1031) not including the Community Involvement variable.

	Mean	Std. Deviation	N
Follow Up - Depression	0.47	0.63	1031
Baseline - Depression	0.63	0.76	1031
Age	16.02	1.14	1031
White	0.21	0.40	1031
Male	0.86	0.35	1031
Prior Six-Months Exposure to violence (witness plus victim)	1.59	1.95	1031
Prior Six-Months Substance Use	0.70	1.27	1031
Baseline - Only Treatment	0.03	0.17	1031
Follow Up - Only Treatment	0.09	0.29	1031
Treatment at Both (Baseline & Follow Up)	0.10	0.30	1031
Baseline - Only Incarcerated	0.16	0.37	1031
Follow Up - Only Incarcerated	0.08	0.27	1031
Incarcerated at Both (Baseline & Follow Up)	0.24	0.43	1031
Treatment at Baseline but Incarcerated at Follow Up	0.01	0.10	1031
Incarcerated at Baseline but Treatment in Follow Up	0.06	0.23	1031

Appendix B: Anxiety

Table 6: Effect of Incarceration on Anxiety (n = 637) including the Community Involvement variable.

	b	Std. Error	B
Baseline - Anxiety	0.314***	0.03	0.378
Age	0.013	0.016	0.029
White	0.098**	0.044	0.083
Male	-0.064	0.047	-0.049
Prior Six-Months Community Involvement	0.042	0.030	0.050
Prior Six-Months Exposure to violence (witness plus victim)	0.014	0.009	0.058
Prior Six-Months Substance Use	0.059***	0.014	0.166
Baseline - Only Treatment	0.043	0.110	0.016
Follow Up - Only Treatment	0.163	0.087	0.073
Treatment at Both (Baseline & Follow Up)	0.233	0.265	0.031
Baseline - Only Incarcerated	-0.064	0.053	-0.045
Follow Up - Only Incarcerated	-0.021	0.063	-0.013
Incarcerated at Both (Baseline & Follow Up)	0.018	0.076	0.009
Treatment at Baseline but Incarcerated at Follow Up	-0.072	0.238	-0.012
Incarcerated at Baseline but Treatment in Follow Up	-0.025	0.226	-0.004

B - Standardized

b - Unstandardized

*p < .05, **p < .01, ***p < .001

Table 7: Descriptive Statistics for Anxiety (n = 637) including the Community Involvement variable.

	Mean	Std. Deviation	N
Follow Up - Anxiety	0.37	0.51	637
Baseline - Anxiety	0.45	0.62	637
Age	15.91	1.12	637
White	0.25	0.43	637
Male	0.81	0.40	637
Prior Six-Months Community Involvement	0.34	0.62	637
Prior Six-Months Exposure to violence (witness plus victim)	1.75	2.19	637
Prior Six-Months Substance Use	0.94	1.46	637
Baseline - Only Treatment	0.04	0.19	637
Follow Up - Only Treatment	0.06	0.23	637
Treatment at Both (Baseline & Follow Up)	0.00	0.07	637
Baseline - Only Incarcerated	0.16	0.36	637
Follow Up - Only Incarcerated	0.11	0.31	637
Incarcerated at Both (Baseline & Follow Up)	0.07	0.25	637
Treatment at Baseline but Incarcerated at Follow Up	0.01	0.09	637
Incarcerated at Baseline but Treatment in Follow Up	0.01	0.00	637

Table 8: Descriptive Statistics for Anxiety (n = 1031) not including the Community Involvement variable.

	Mean	Std. Deviation	N
Follow Up - Anxiety	0.37	0.54	1031
Baseline - Anxiety	0.49	0.65	1031
Age	16.02	1.14	1031
White	0.21	0.40	1031
Male	0.86	0.35	1031
Prior Six-Months Exposure to violence (witness plus victim)	1.59	1.95	1031
Prior Six-Months Substance Use	0.70	1.27	1031
Baseline - Only Treatment	0.03	0.17	1031
Follow Up - Only Treatment	0.09	0.29	1031
Treatment at Both (Baseline & Follow Up)	0.10	0.30	1031
Baseline - Only Incarcerated	0.16	0.37	1031
Follow Up - Only Incarcerated	0.08	0.27	1031
Incarcerated at Both (Baseline & Follow Up)	0.24	0.43	1031
Treatment at Baseline but Incarcerated at Follow Up	0.01	0.10	1031
Incarcerated at Baseline but Treatment in Follow Up	0.06	0.23	1031

Appendix C: Correlation Matrixes

Table 9: Correlation Matrix with Community Involvement

<i>Correlation</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
1 Age	1																		
2 B – D	.08*	1																	
3 B – A	.04	.68**	1																
4 F – D	.07	.49**	.39**	1															
5 F – A	.06	.39**	.42**	.65**	1														
6 Comm. Inv.	-	-.02	-.00	.07	.06	1													
7 ETV	.06	.09*	.13**	.10**	.16**	.01	1												
8 SU	.11**	.13**	.11**	.24**	.26**	-.01	.34**	1											
9 White	.02	.02	.07	.11**	.15**	-.02	-.08*	.23**	1										
10 Male	-.02	-.15**	-.20**	-	-.12**	.07	.10**	.02	-.06	1									
11 B - OT	-.01	.00	-.08	-.03	-.04	-.04	-.01	-.06	-.02	.03	1								
12 F - OT	-.07	-.00	-.01	.09*	.09*	.19**	.10*	.08*	.01	.03	-.05	1							
13 T at BT	-.08	.02	-.02	-.01	.02	-.04	-.03	.00	-.04	.03	-.01	-.02	1						
14 B - OI	-.01	.13**	.08	-.09*	-.05	-.08*	.01	-.07	-.09*	.06	-.08*	-.01	-.03	1					
15 F - OI	-.01	.01	-.01	.15**	.01	-.02	.10*	.13**	.01	.03	.07	-.08*	-.02	-.15**	1				
16 INC at BT	.07	.10*	.08	.15**	.08	-.08	.14**	.21**	-.03	-.01	-.05	-.07	-.02	-.12**	-.09*	1			
17 T at B but INC at F	-.01	.03	-.04	.02	-.03	-.05	-.02	.00	-.01	.04	.46**	-.02	-.01	-.04	.26**	-.02	1		
18 INC at B but T in F	.02	-.02	.02	-.01	.02	.04	.09*	-.02	-.05	.04	-.02	.36**	-.01	.21**	-.03	-.02	-.01	1	

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Listwise N=637

Comm. Inv. = Follow Up – Community Involvement

ETV = Past Six-Months - Exposure to Violence

SU = Past Six-Months - Substance use

B = Baseline

F = Follow Up

D = Depression

A = Anxiety

OT = Only Treatment

BT = Both Times

OI = Only Incarcerated

INC = Incarcerated

T = Treatment

Table 10: Correlation Matrix without Community Involvement

<i>Correlation</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 Age	1																
2 B - D	.12**	1															
3 B - A	.07*	.70**	1														
4 F - D	.09**	.50**	.42**	1													
5 F - A	.04	.35**	.41**	.64**	1												
6 ETV	.01	.09**	.14**	.11**	.15**	1											
7 SU	.05	.04	.06	.14**	.19**	.35**	1										
8 White	-.04	-.01	.05	.05	.10**	-.04	.22**	1									
9 Male	.03	-.04	-.12**	-.10**	-.11**	.07*	-.02	-.08*	1								
10 B - OT	-.01	-.02	-.06*	-.04	-.03	-.00	-.04	.02	.00	1							
11 F - OT	-.09**	-.04	-.02	.05	.02	-.01	-.03	.00	.01	-.06	1						
12 T at BT	.06*	.05	-.06	.04	-.02	-.08*	-.09**	-.09**	.11**	-.06	-.11**	1					
13 B - OI	-.05	.01	.03	-.08*	-.03	-.04	-.08**	-.05	.01	-.07*	.40**	-.14**	1				
14 F - OI	-.05	-.05	-.05	.07*	-.01	.10**	.15**	.05	-.01	.17**	-.09**	-.10**	-.13**	1			
15 INC at BT	.14**	.23**	.16**	.15**	.07*	.06*	-.02	-.10**	.11**	-.10**	-.18**	-.19**	-.25**	-.17**	1		
16 T at B but INC at F	-.00	-.02	-.04	-.00	-.02	-.01	-.01	.02	.01	.58**	-.03	-.03	-.04	.34**	-.06	1	
17 INC at B but T in F	-.04	-.00	-.00	.015	-.01	-.07*	-.11**	-.03	.03	-.04	.77**	-.08**	.56**	-.07*	-.14**	-.02	1

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Listwise N=1031

ETV = Past Six Months - Exposure to Violence

SU = Past Six Months - Substance use

B = Baseline

F = Follow Up

D = Depression

A = Anxiety

OT = Only Treatment

BT = Both Times

OI = Only Incarcerated

INC = Incarcerated

T = Treatment

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