Assessing the links between Internalizing Symptoms and Treatment Motivation in Incarcerated Juveniles

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Abstract

The assessment of internalizing symptoms among incarcerated juveniles is limited. Untreated internalizing symptoms can lead to both problems within the facility as well as a higher likelihood of recidivism. However, more research is needed to understand how specific types of symptoms experienced (i.e., depressive vs. anxiety symptoms) are associated with treatment motivation (i.e., problem recognition and treatment readiness) to inform treatment approaches. Alexithymia (i.e., difficulties communicating emotions) is prevalent in incarcerated juveniles and may contribute to the links between internalizing symptoms and treatment motivation. Accordingly, this study evaluated associations between internalizing symptoms and treatment motivation, including the influence of alexithymia, among detained youth.

The study used data from 111 detained juveniles who responded to surveys assessing levels of internalizing symptoms, alexithymia, and treatment motivation. An Exploratory Factor Analysis was conducted on all items of the PROMIS Anxiety scale (Ader, 2007) and SMFQ (Short Mood and Feelings Questionnaire; Angold et al., 1995) and revealed that the items measure two separate constructs (i.e., anxiety and depression, respectively) rather than shared negative affectivity in the population. Additionally, Confirmatory Factor Analyses on the PROMIS and SMFQ revealed that unifactorial models of depression and anxiety were maintained in incarcerated juveniles. Path models suggested that higher levels of depression, higher levels of anxiety, and higher levels of alexithymia were linked to higher levels of problem recognition when internalizing symptoms were assessed both simultaneously and separately. While higher levels of depressive and anxiety symptoms were linked to higher levels of treatment readiness when assessed in separate models, no variable was uniquely associated with treatment readiness when internalizing symptoms were assessed simultaneously. Further, alexithymia did not moderate any of the associations examined. Findings suggest that anxiety and depressive symptoms are both more strongly linked to problem recognition than treatment motivation. Implications for facility staff and clinicians are discussed.

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Assessing the links between Internalizing Symptoms and Treatment Motivation in Incarcerated Juveniles

Many youth involved in the juvenile justice system present with symptoms of psychological disorders in addition to the behavioral problems that led to their incarceration. Research suggests that 7-26% of males and 21-55% of females meet criteria for an anxiety disorder and 17-36% of males and 26-52% of females meet criteria for Major Depressive Disorder upon intake into the facility (i.e., Archer et al., 2010; Karnik et al., 2009; Wylie & Rufino, 2018). Stressors related to incarceration and processing through the juvenile justice system can increase levels of stress. Further, many juvenile offenders experience risk factors associated with psychological disorders early in life. Therefore, it is not surprising that rates of psychological disorders are much higher in this population (e.g., Casswell, French, & Rogers, 2012; White, Shi, Hirschfield, Mun & Lober, 2010). However, symptoms are often undetected or are not assessed thoroughly among incarcerated juveniles (e.g., Mitchell & Shaw, 2011), with some research indicating that up to half of youth with symptoms of psychological disorders are not identified during their intake into the facility (e.g., Burke, Mulvey & Schubert, 2015).

Many times, symptoms of psychological disorders do not manifest themselves to facility staff right away. Youth who rate themselves as having more problems when being interviewed during their intake are more likely to be recognized as having problems managing their symptoms (e.g., Mitchell & Shaw, 2011). However, youth who do not subjectively rate their symptoms as impairing or who may lack insight into the severity of their symptoms may not receive the appropriate help. Therefore, facility staff are often responsible for asking direct questions about symptoms of psychological disorders, which may help identify youth with mental health problems.

Youth with mental health problems may be provided with community referrals upon their release or be offered treatment within the facility. While efforts and improvements have been made to provide appropriate screening of mental health problems within juvenile detention facilities (e.g.,

Penn & Thomas, 2005), youth within the juvenile justice system overall display low levels of internal motivation for treatment of their mental health problems (Yeterian, Greene, Bergman, & Kelly, 2013). As a consequence, incarcerated juveniles may not take advantage of treatment services within the facility or referrals after their release. Thus, there is a need to further understand the intersection between psychopathology and treatment motivation among incarcerated juveniles. The goal of the current study was to evaluate associations between depressive and anxiety symptoms and treatment motivation within a sample of incarcerated juveniles.

Consistent with the goal of the study, the first aim of this research was to evaluate the measurement of internalizing symptoms in incarcerated juveniles. The second aim of the study was to assess the link between depressive and anxiety symptoms and treatment motivation. Finally, the third aim of the study was to examine the role of alexithymia (i.e., difficulties in identifying and describing emotions), which may interfere with motivation for treatment in incarcerated juveniles who report depressive and anxiety symptoms.

Mental Health Problems in Youth

During adolescence, youth to begin to spend more time with peers and value their peer relationships as they transition away from dependence on their parents (Casswell et al., 2012). Often, this may lead to experimenting with risky behaviors in order to gain acceptance with peers and challenges in defining one's self-concept. Neurological and psychosocial changes in adolescence, as well as the influence of delinquent peers place adolescents at a higher risk for engaging in risky behaviors (e.g., Barbot & Hunter, 2012; Dodge, Greenberg, & Malone, 2008; Steinberg, 2008). The transition to adolescence may also be associated with the emergence of new problems related to self-acceptance and social approval, even in the general population, thus leading to greater vulnerabilities in developing symptoms of psychological disorders (e.g., Casswell et al., 2012). Of note, up to 75% of psychological disorders emerge during adolescence and young adulthood, around ages 15 to 25

(e.g., Casswell, et al., 2012). Adolescence, therefore, may include increases in risk-taking behaviors, coinciding with the emergence of psychological disorders.

High rates of psychological disorders in juvenile offenders may partially be linked to the developmental challenges associated with adolescence. However, the significantly higher rates of psychological disorders in the juvenile justice population may further emphasize the need for facilities to better identify and treat the youth in their care who are struggling with symptoms of psychological disorders. Since juvenile detention facilities house youth who are pre-adolescents or adolescents, it is of particular importance that juvenile detention facilities use empirically validated assessments of psychopathology to screen vulnerable youth entering their facility.

Internalizing Symptoms in Juvenile Offenders

While externalizing symptoms such as acting out behaviors, impulsivity, and defiance may be readily observable, internalizing symptoms can be much more difficult to detect within a residential setting. Rates of internalizing symptoms are estimated to be as high as 75% within the juvenile offender population in some studies (i.e., Burke et al., 2015), while others report that juvenile offenders meet criteria for internalizing disorders at a rate of 11-33% (i.e., White et al., 2010).

Previous research on the impact of internalizing disorders on offending have suggested that externalizing behaviors share common risk factors with internalizing disorders such as heightened emotion reactivity, poor executive control, and challenges in forming relationships with peers (i.e., Lee & Stone, 2012; Oldehinkel, Hartman, de Winter, Veenstra, & Ormel, 2004; Rockhill, van der Stoep, Mccauley, & Katon, 2009). Limited assessment and treatment of such internalizing symptoms may perpetuate the behavioral issues that led to incarceration; thus, a lack of treatment of these symptoms is often related to higher rates of recidivism (Ford, Chapman, Connor & Cruise 2012; Mulder, Brand, Bullens, & Van Marle, 2010).

Further, many juvenile offenders who are eventually detained already have underlying symptoms of internalizing disorders (White et al., 2010). These symptoms may be further exacerbated when youth are processed through the juvenile justice system. Previous research suggests that youth who have psychological disorders are more likely to display a greater prevalence, frequency, and severity of crimes, thus highlighting the importance of identifying and treating youth with psychological disorders, particularly when psychopathology is not as observable (e.g., Molina & Pelham, 2003).

While rates of depression vary across studies of juvenile offenders depending on methods of measuring symptoms (i.e., type of diagnostic interview or assessment tool) and specific juvenile population (e.g., diversion or incarcerated), rates do indicate that depressive symptoms are a concern in populations of juvenile offenders. In a study of incarcerated juveniles, it was estimated that up to 26% of females and 17% of males reported depressive symptoms at intake to the facility when interviewed using the Diagnostic Interview Schedule for Children (DISC; Teplin et al., 2002). Another study identified 51.8% of females and 36% of males as meeting DSM-IV diagnostic criteria for a depressive disorder at intake into the facility; higher rates in this sample may be due in part to a predominantly male sample (i.e., 90.8% male), and therefore, less variability regarding depression symptomology in females. In a sample of offending youth referred to diversion, 19.6% of youth were found to meet criteria for an affective disorder (i.e., depression or mania) based off the DISC Predictive Scales (Wylie & Rufino, 2018). Depression is associated with peer rejection, hostility, poor academic outcomes, and aggression, all which are linked to delinquency (e.g., Kuo et al., 2005; Martinez-Ferrer & Stattin, 2017). Long-term effects of untreated depression include poor interpersonal functioning, substance abuse, fewer years of educational attainment, and recurrent episodes of depression (Hammen, Brennan, & Keenan-Miller, 2008; Richardson et al., 2014).

Anxiety disorders are associated with irritability, impulsivity, substance use, and school refusal, and can contribute to behaviors that may lead to a youth's arrest (Jones & Suveg, 2015;

Marmorstein, White, Loeber, & Stouthamer-Loeber, 2010). Endorsing symptoms of anxiety is very common amongst juvenile offenders, as many have experienced a series of negative life events or even traumatic stress (Dierkhising, Ko, Woods-Jaeger, Briggs, Lee, & Pynoos, 2013; Mitchell & Shaw, 2011). Similar to studies on prevalence rates of depression in incarcerated juveniles, the prevalence of anxiety disorders also varies depending on the method of measurement and juvenile population (i.e., incarcerated, previously incarcerated, on probation, etc.). A study by Archer et al. (2010) identified 6.9% of males and 20.9% of females meeting DSM-IV criteria for an anxiety disorder at intake during to the facility (Archer et al., 2010). A study of youth referred to diversion identified approximately 35% of youth as meeting criteria for an anxiety disorder based off the DISC Predictive Scales (i.e., Wylie & Rufino, 2018). Prevalence rates for anxiety disorders based off DSM-IV criteria are estimated to be approximately 26% for male and 55% for female incarcerated offenders when assessed after nine months of incarceration (e.g., Karnik et al., 2009), suggesting that psychological disorders persist in juveniles even after their arrest and intake into the facility. An understanding of anxiety disorders and their effects on interpersonal relationships may be vital for the success and safety of facilities in addition to referring youth to appropriate therapy services.

Many youth in juvenile detention facilities display high levels of anxiety in addition to having experienced traumatic events. For instance, symptoms of generalized anxiety disorder and social anxiety disorder have been found to predict early onset and problem substance use, placing youth at a higher risk for delinquency (e.g., Marmostein et al., 2010). Anxiety may frequently present as irritability in youth (i.e., American Psychiatric Association, 2013), and may lead to more interpersonal conflicts and oppositional behaviors that lead to incarceration, or that are presented within the facility.

Note, however, there is some evidence that symptoms of depression and anxiety actually decrease risks of arrest when controlling for demographics, substance use, school, and peer factors (e.g., Hirschfield, Maschi, White, Traub, & Loeber, 2006). This may illustrate the fact that there may

exist additional factors related to the processing of emotions, such as alexithymia, that help to explain the link between internalizing symptoms and subsequent outcomes.

Assessment of Depression and Anxiety within Facilities

Typically, trained staff are not present to provide a formal diagnostic assessment of psychological disorders for incarcerated juveniles who report internalizing symptoms. Therefore, facility staff may administer broadband self-report measures and assessments as a general screening for psychological disorders. Current assessments for psychological symptoms, such as the MAYSI-2 (Grisso & Barnum, 2000), can provide diagnostic impressions for youth who are screened using the measure. The Massachusetts Youth Screening Instrument, Second Version (MAYSI-2) is a 52-item validated assessment designed for screening mental health problems amongst youth ages 12-17 in juvenile justice settings. The MAYSI-2 is endorsed by the American Academy of Child and Adolescent Psychiatrists (Penn & Thomas, 2005) and can be administered by staff without clinical training and can help determine if a youth demonstrates elevated levels of substance use, internalizing symptoms, suicidal ideation, thought disturbance, somatic complaints, or anger problems (Gilbert, Grande, Hallman, & Underwood, 2015). However, psychometrics of the MAYSI-2 have not always demonstrated adequate sensitivity in identifying youth who may have elevated symptoms of psychopathology, particularly internalizing symptomology (Kuo et al., 2005). Part of this reason may be that the MAYSI-2 focuses on broadband screening for several problem domains rather than focusing specifically on certain problems or symptoms. There is a need for validated measurements of internalizing disorders within juvenile detention facilities that are practical, can be interpreted quickly, and can be administered by facility staff. To date, there is limited data on the validity of different narrow-band measures of depression and anxiety within a juvenile justice setting. Validated and easily administered assessments with good psychometrics could help identify youth who have high levels of depression and anxiety.

One measure of depression that has some limited research within population of juvenile offenders is the Short Mood and Feelings Questionnaire (SMFQ; Angold et al., 1995). The SMFQ is available free to the public and can also provide an assessment of depressive symptoms for no cost. The SMFQ has been validated in a in a sample of incarcerated juvenile offenders and has produced a unifactorial scale with good reliability ($\alpha = .97$) and strong item loadings (ranging from .43 to .78; Kuo et al., 2005). In their validation study, Kuo et al. (2005) identified that the SMFQ demonstrates concurrent validity with existing assessments of depression in youth (i.e., the V-DISC). In the same study, the authors provided support for content validity of the SMFQ in incarcerated youth when compared to the original 33-item MFQ (Kent, Vostanis, & Feehan, 1997). The authors also concluded that the SMFQ provides internal reliability and measurement invariance comparable to studies in the general population. Research on the SMFQ has helped identify the appropriateness of the measure in identifying incarcerated juveniles with high levels of depression. Kuo et al. (2005) have suggested specific cutoff scores, which may be more appropriate for juvenile offender populations, and identified that a score on the SMFQ ≥ 10 provides the best sensitivity and specificity. This is higher than the cutoff score in the general population that provides the best sensitivity and specificity (SMFQ ≥ 8). The authors posit that a higher SMFQ cutoff score is more meaningful for juvenile offenders, as many experience depressive symptoms related to situational stress (e.g., stressors of being detained in a facility) in addition to experiencing depressive symptoms that have been more chronic in nature.

Further, the SMFQ shows better psychometrics than other measures of internalizing symptoms commonly used in screening incarcerated juveniles. In a sample of 228 detained adolescents who were administered the Voice Diagnostic Interview Schedule for Children (V-DISC) and SMFQ, Kuo et al. (2005) found that the SMFQ has better positive predictive value and Area Under the Curve (AUC) than the MAYSI-2 or V-DISC, two other diagnostic assessment measures which focus on broadband screenings of psychological symptoms. Further, assessments such as the

V-DISC can be time-consuming in administration, and the MAYSI-2 does not provide a diagnosis of depression but instead only identifies youth at risk for a variety of disorders including depression. The MAYSI-2 also has only a 50% sensitivity rate, which makes it likely that many youth who do show high levels of depressive symptoms may not always be identified by the assessment (Kuo et al., 2005). Based on the study by Kuo et al. (2005), the SMFQ may provide a validated and accurate assessment of depressive symptoms in incarcerated juveniles. However, additional research replicating the work on Kuo et al. (2005) is needed to further support its use.

To date, there is not a published assessment of anxiety that has been validated in a population of incarcerated juveniles. The MAYSI-2 calculates a subscale of both depressive and anxiety symptoms but does not contain a measure that is specific to symptoms of anxiety. Therefore, high scores on a subscale of depressive and anxiety symptoms, such as through the MAYSI-2, may not indicate whether a youth has high symptoms of depression, anxiety, or both. One measure of anxiety which has been validated in community samples, the PROMIS Anxiety subscale (Ader, 2007), shows good psychometrics in measuring levels of anxiety, including constructs such as fearfulness, worry, and nervousness in youth. Research on the PROMIS Anxiety subscale has demonstrated its wide utility in measuring symptoms of anxiety in medical settings (e.g., DeWalt et al., 2015), school-wide settings (Irwin et al., 2010), and in other research settings (e.g., Irwin et al., 2010). However, to date, development and validation studies on the PROMIS Anxiety subscale have mainly relied on content analysis (Walsh, Irwin, Meier, Varni, & DeWalt, 2008) or Item Response Theory (Irwin et al., 2010). There are no known studies that confirm the factor structure of the PROMIS Anxiety subscale in youth using Exploratory Factor Analysis (EFA) or Confirmatory Factor Analysis (CFA) techniques. While Irwin et al. (2010) conducted a CFA on PROMIS Anxiety subscale items, the CFA was conducted using items that assess for both anxiety and depression. The goal of the CFA by Irwin et al. (2010) was to confirm that a bi-factor model (i.e., anxiety and depression) would be produced

from all items measuring internalizing symptoms, which suggested that the items were not just measuring negative affectivity.

The PROMIS Anxiety subscale is a measure that is available at no cost to the public and can be easily self-administered by facility staff. This measure may also provide a good measurement of anxiety in juvenile offender populations. If the PROMIS Anxiety subscale is validated in a sample of incarcerated juveniles, it may provide facility staff with a cost-effective and practical assessment of anxiety symptoms for youth in their care. Accordingly, the current study evaluated the psychometric properties of the PROMIS Anxiety subscale as well as the SMFQ prior to evaluating the associations between these symptom clusters and treatment motivation.

Treatment Motivation in Incarcerated Juveniles

Though there exist numerous barriers to obtaining quality mental health treatment (e.g., financial, cultural, and access to care), motivation for treatment may also be a significant barrier for youth to initiate and adhere to therapy (Breda & Riemer, 2012). Youth who are not motivated to change their behaviors or learn ways to cope with emotional problems may have difficulty making positive changes in therapy and developing a working alliance with the therapist (Ilgen, McKellar, Moos, & Finney, 2006; Prochaska & DiClemente, 1982). Ultimately, lack of motivation for treatment is associated with poor treatment outcome (e.g., Ilgen et al., 2006). Even if juvenile detention facilities screen youth for symptoms of psychiatric disorders and recommend that youth begin or initiate therapy, youth may not ultimately engage in treatment. Incarcerated juveniles have already received consequences for their behaviors by being arrested. However, the problem of low motivation for behavior change is further highlighted by a continued lack of motivation for treatment, even with pressures from the court to engage in mandated therapy (e.g., Yeterian et al., 2013), and this may depend on the stage of motivation for change.

The stages of change model posits that motivation for change consists of several stages (e.g., Prochaska, DiClemente, & Norcross, 1992; Prochaska & DiClemente, 1982) ranging from precontemplation (i.e., denying or choosing to ignore problems) to maintenance (e.g., the individual has made behavioral changes and is committed to preserving such changes). Many treatment perspectives assume that clients are ready to change their behaviors that led to them beginning therapy (Prochaska, Norcross, & DiClemente, 1995). However, many times this is not the case.

Individuals who are not motivated to change their behavior may be even less inclined to do so when treatment is mandated. Pressure to attend therapy from the facility or the court may be one factor that influences youth's motivation for treatment. Youth who have been detained may face legal pressure, parental pressures, or other external pressure for entering therapy (Brauers, Kroneman, Otten, Lindauer, & Popma, 2016; Yeterian et al., 2013). Consistent with theories on motivation for change, previous research has focused on the weaknesses of having only external pressure and little internal motivation on treatment adherence and initiation (e.g., Breda & Riemer, 2012; DiClemente & Prochaska, 1998; McMurran, Theodosi, & Sellen, 2006). Youth who are pressured into treatment may feel a loss of self-efficacy, leading to poor treatment engagement (e.g., Yeterian et al., 2013). Other research has found that youth who are referred to treatment by the justice system may initially show a strong motivation for treatment as they are aware of the negative consequences of not attending treatment (e.g., additional sanctions or fines). However, this motivation has been shown to decline over time, when compared to youth who are referred to treatment from agencies outside the justice system (i.e., Yeterian et al., 2013). Further, youth who are in compulsory care (e.g., residential treatment facilities), often have trouble engaging in treatment even though they are required to meet with a therapist and work through a behavioral program, and are not given the choice to leave the treatment center (Brauers et al., 2016). Other research argues that mandated treatment as well as demographic variables such as age, gender, and race do not strongly influence treatment motivation. Instead, greater severity of symptoms, recognizing the consequences of problem alcohol and drug

use, and amount of legal pressure are associated with greater treatment motivation (i.e., Battjes, Gordon, O'Grady, Kinlock, & Carswell, 2003).

For the current study, two components of treatment motivation were evaluated, both the ability to recognize that certain feelings and behaviors are causing problems (i.e. problem recognition), and the youth's readiness to enter treatment (i.e., treatment readiness). While the two concepts are related, they are distinct constructs regarding treatment motivation (i.e., Breda & Riemer, 2012) that need to be evaluated separately.

In terms of symptomology, the literature is mixed on whether higher symptom severity is associated with increased or decreased levels of treatment motivation. Breda and Riemer (2012) found that individuals reporting more severe internalizing symptoms were more likely to endorse higher overall treatment motivation, problem recognition, and treatment readiness. However, the authors could not conclude if the higher motivation was due to a lack of proper treatment for internalizing symptoms in the past, leading to youth desiring additional treatment, as their symptoms had worsened over time. Yeterian et al. (2013) found that higher levels of psychological distress were related to greater treatment motivation, but not related to a desire to find solutions for problem emotions or behaviors. While intrinsic motivation is generally related to better treatment engagement and outcome, the authors posit that individuals with more severe symptoms may present with higher intrinsic motivation for treatment but may make slower treatment progress due to their symptom severity.

Given these mixed findings, traits of specific internalizing disorders (i.e., depressive vs. anxiety symptoms) may help to explain the link between symptom severity and treatment motivation, rather than solely the amount of psychological distress. Youth are more likely to seek out help when they recognize they may be struggling with mental health issues and have the knowledge, support, and resources to seek help (Rickwood, Deane, & Wilson, 2007; Zwaanswijk, Verhaak, Bensing, Van der Ende, & Verhulst, 2003). Yet, even with the available support and resources, individuals with

depressive symptoms and suicidal ideation may be less likely to be motivated to seek treatment or social support for their symptoms (i.e., Wilson & Deane, 2010).

Help negation is a phenomenon in the treatment motivation literature related to treatment seeking in youth who experience depression and suicidal ideation (e.g., Wilson & Deane, 2010). Youth with severe symptoms of depression or suicidal ideation may begin to reject help from others and stop seeking out help for their symptoms, possibly due to apathy and decreased motivation associated with depressive symptoms. Not only does help negation include rejecting help from treatment providers, but with high levels of depressive symptoms and suicidal ideation, youth may also refuse help from family members and close friends (i.e., Wilson & Deane, 2010). The individual's cognitive responses to psychological distress may explain the relation between high levels of depressive symptoms and low levels of motivation to seek help. Wilson and Deane (2010) found that individuals who often view situations as hopeless or who are self-critical are less likely to seek help. Other traits common to help negation are poor judgment and decision-making, challenges with problem-solving and adaptive coping, and difficulties with interpersonal skills (i.e., Wilson & Deane, 2010). Individuals who experience hopelessness may have poor judgment regarding their need to receive help in managing their emotions, as they may already be committed to the idea that their feelings or present situation are unable to improve. These cognitive responses and traits may explain the lack of help-seeking intentions of those experiencing depressive symptoms. Thus, it was expected that higher levels of depressive symptoms would be associated with lower treatment motivation, both in terms of problem recognition and treatment readiness.

The link between symptoms of anxiety and treatment motivation are less clear (Wilson & Deane, 2010). Some research suggests that anxiety may in fact prompt youth to seek help for their symptoms; therefore, higher levels of anxiety would be associated with greater treatment motivation (Thompson, Hunt, Issakidis, 2004). A prominent process underlying anxiety is avoidance (e.g., Seligman & Ollendick, 2011). Youth who have high levels of anxiety may choose not to seek

treatment due to anxiety associated with discussing their problems, meeting a new therapist, or requesting help and treatment. Some theories on the etiology of anxiety disorders suggest that cognitive avoidance (e.g., worry as a means to avoid thinking about or experiencing negative emotions) leads to Generalized Anxiety Disorder symptoms (e.g., Olatunji, Moretz, & Zlomke, 2010; Rood, Roelofs, Bogels, & Alloy, 2010). Further, other research posits that rumination (i.e., dwelling on past events) allows for individuals to distract from situations that they find to be personally threatening (e.g., Dickson, Ciesla, & Reilly, 2012). Individuals may feel that their rumination can lead to more positive coping and problem-solving. However, rumination may in fact increase or sustain levels of anxiety, as it may be a means to divert thoughts about core beliefs that trigger anxiety. Due to the continued avoidance of anxiety-provoking situations, individuals who ruminate may actually be increasing their levels of anxiety (e.g., Dickson et al., 2012). By not addressing the root issues of their anxiety, individuals who ruminate may have little desire to find solutions to problems leading to their anxiety. However, it is likely that the distress resulting from rumination may lead individuals to recognize that their feelings are causing impairment, thus their high levels of problem recognition.

Further, youth who report symptoms of anxiety disorders, such as Social Phobia, demonstrate a tension between avoiding and exploring in social situations; while they may be motivated to improve their confidence in social situations, they also note their urges to avoid these situations due to anxiety (Kashdan, Elhai, & Breen, 2008). Therefore, a combination of both approach and avoidance may explain a conflict related to treatment motivation in anxious youth.

Specific to a sample of juvenile offenders, previous research suggests that behaviors commonly associated with juvenile offending, such as substance use and aggression, are prevalent in anxious youth who rate themselves high in emotionally-avoidant behavior (e.g., Bulley, Miloyan, Brilot, Gullo, & Suddendorf, 2016). Given the context of a population of juvenile offenders, it is likely that their anxiety may be associated with avoidance of their current emotional states and life

stressors, and consequently may lead to lower treatment readiness. However, juveniles may experience a tension between approach and avoidance goals. While they may have the motivation to recognize that their feelings and behaviors are causing problems, their anxiety may lead them to avoid taking action or challenging their core beliefs (i.e., participating in counseling) to address their problem emotions. Therefore, it was expected that high levels of anxiety symptoms would be associated with high problem recognition but with low treatment readiness. However, other factors, such as difficulty in communicating emotions (i.e., alexithymia), may also influence these associations.

The Role of Alexithymia

Alexithymia is one factor related to emotional processing that can moderate the relationship between depression and anxiety and treatment motivation (i.e., treatment readiness and problem recognition). While there are many potential moderators of the link between internalizing symptoms and treatment motivation (e.g., high levels of parental psychopathology, low levels of parent and child-rated treatment credibility, or poor therapeutic alliance; Levin & Henderson, & Ehrenreich-May, 2012; Wergeland et al., 2015), alexithymia may be one moderator that can be altered within a facility setting in order to improve youth outcomes (i.e., it does not require systems-based participation such as modifying parent behavior or other environmental factors). Alexithymia reflects a deficit in emotion processing and communication, including difficulties in identifying and describing feelings and high levels of externally oriented thinking (i.e., a cognitive pattern of low levels of introspection; Bagby, Parker & Taylor, 1994). Further, alexithymia is widely prevalent in juvenile offender populations (Snow, Woodward, Mathis, & Powell, 2016; Zimmerman, 2006), and if decreased within the facility, can lead to therapy progress and symptom reduction (Eastabrook, Flynn, & Hollenstein, 2014). While alexithymia may be considered to be stable across time and situations (e.g., Porcelli, Tulipani, DiMicco, Spedicato, & Maiello, 2011; Salminem, Saarojarvo, &

Tamminen, 1994), it is amenable to change with interventions. For instance, commonly used interventions, such as Cognitive-Behavioral Therapy, have been shown to significantly improve individuals' abilities to identify and communicate emotions (i.e., decrease levels of alexithymia) in individuals who have depression or anxiety-related disorders (e.g., Rufer et al., 2004; Rufer et al., 2010; Spek, Nyklicek, Cuijpers, & Pop, 2008). Therefore, alexithymia was the focus of the current study as it has the potential to influence treatment outcome, does not require the involvement of external factors such as parental motivation, and can be addressed within the juvenile detention facility before youth begin treatment.

Alexithymia may also be related to higher levels of psychopathology and challenges in social relationships (e.g., Honkalampi et al., 2009). Greater difficulties in identifying and describing emotions (i.e., high levels of alexithymia) are associated with elevated levels of internalizing symptoms (Angold et al., 1995; Angold, Erkanli, Silberg, Eaves & Costello, 2002) and a host of negative behaviors including non-suicidal self-injury (Gatta, Dal Santo, Rago, Spoto & Battistella, 2016), and behavioral challenges (Manninen et al., 2011). Similar findings have been found in research related to high-risk adolescents (e.g., Pihet, Combremont, Suter, & Stephan, 2012). Adolescents who have difficulty communicating negative feelings to social supports (i.e., high levels of alexithymia) may have more difficulty asking for help and may resolve their distress through negative coping mechanisms (e.g., Gatta et al., 2016). Alexithymia has also been found to play a role in the link between internalizing and externalizing symptomology and may further explain the link between internalizing symptoms and delinquency (i.e., Lavaf, Ghanbari & Shokri, 2016).

Most youth are aware that attending counseling would require them to discuss feelings or behaviors that are interfering with their safety, daily functioning, or quality of life. Youth who have trouble identifying and describing their emotions (i.e., high levels of alexithymia) may find this daunting, as they already have difficulties in communicating negative emotions (Gatta et al., 2016), and may be less inclined to see the value in attending counseling or believe they have the ability to

do so. Youth with greater difficulties in describing their emotions may also be unable to identify that their behaviors or feelings are causing problems, and may not be motivated for treatment, even when therapy has been mandated by the court (e.g., Yeterian et al., 2013). Given that incarcerated juveniles have been given clear consequences for their behaviors by being arrested and detained, youth who continue to lack the insight regarding the seriousness of their behavioral or emotional problems leading to their arrest are less likely to make long-term behavior changes. Therefore, deficits in emotion identification and communication (i.e., high levels of alexithymia) may moderate the link between internalizing symptoms and treatment motivation in incarcerated juveniles, such that symptoms of depression and anxiety would be related to lower treatment motivation (i.e., both problem recognition and treatment readiness) when alexithymia is high.

Current Study

Extant research has examined the link between psychological symptoms and motivation for treatment (e.g., Battjes et al., 2003; Breda & Riemer, 2012); however, the literature is not always consistent with regards to the direction of the link between symptoms of depression or anxiety and motivation for treatment. Further, research on the role of emotional factors in this link has not been examined. Incarcerated juveniles are an understudied population in the treatment literature, and there is limited research on the impact of internalizing symptoms in this population. Untreated internalizing symptoms in juvenile justice populations have been associated with increased recidivism, poor quality of life, and risky behaviors including substance use, violence, self-harm, and suicide (e.g., Mulder et al., 2010; Stokes, McCoy, Abram, Byck, & Teplin, 2015). Despite this link, levels of motivation for treatment are relatively low, placing youth at-risk for problems within the facility and increasing the chance of recidivism. Research on factors that may explain the association between levels of depressive and anxiety symptoms and treatment motivation may be important in understanding ways to encourage vulnerable youth to remain open to receiving help and decrease the

negative consequences of untreated symptoms. Difficulty identifying and communicating negative emotions (i.e., high levels of alexithymia) is common in juvenile populations and could be a factor that weakens the link between high levels of depression or anxiety and levels of treatment motivation. As such, this was the first study to assess the impact of alexithymia on the link between internalizing symptoms and treatment motivation within an incarcerated juvenile population.

The first aim of the current study was to assess the present study's measures of depression and anxiety in a sample of incarcerated juveniles. An EFA was first conducted using all items from the PROMIS and SMFQ to identify whether items load onto more than one factor (i.e., indicating that the items do not just measure negative affectivity). The current study then replicated the Confirmatory Factor Analysis (CFA) from Kuo et al. (2005) in order to evaluate whether the SMFQ provides a unifactorial measure of depressive symptoms in incarcerated juveniles. The measure of anxiety in the current study, the PROMIS Anxiety subscale, has been validated in community samples, and found to have a one-factor structure, but has not been validated in a population of incarcerated juveniles. Therefore, the present study aimed to assess whether the PROMIS Anxiety subscale may also demonstrate a unifactorial structure in a sample of incarcerated juveniles.

The second aim of the study was to understand the links between symptoms of depression and anxiety and treatment motivation. The third aim was to understand whether alexithymia moderates the links between depressive and anxiety symptoms and levels of treatment motivation (see Figure 1).

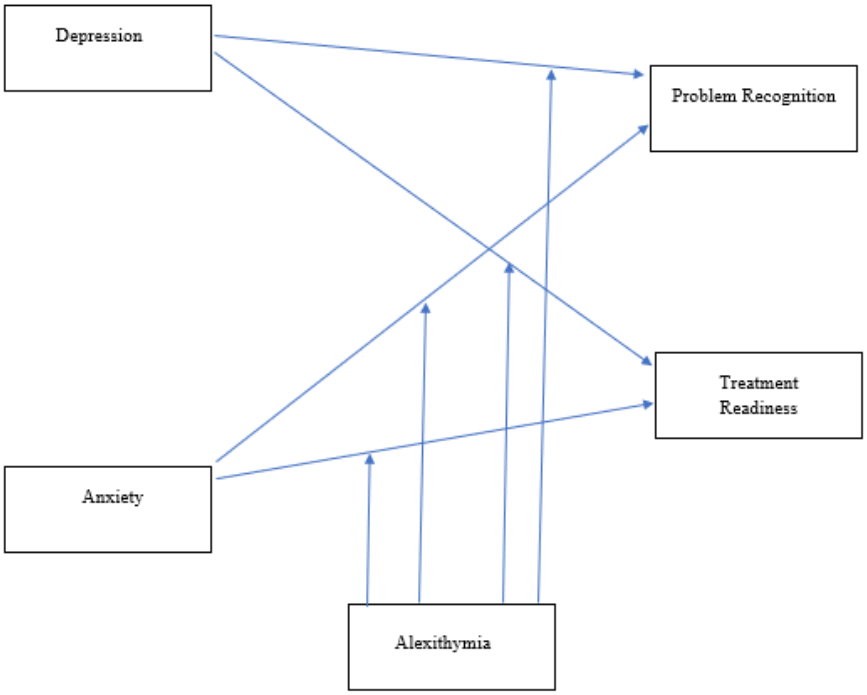

Figure 1. Hypothesized Path Model

It was hypothesized that high levels of depression would be related to low levels of treatment motivation, both in terms of problem recognition and treatment readiness. Alexithymia was expected to moderate the link between depression and both components of treatment motivation, such that depression would be associated with lower levels of problem recognition and treatment readiness when alexithymia was also high.

Given the combination of approach and avoidance goals observed in anxiety disorders (e.g., Kashdan et al., 2008) and potential impact of rumination on problem recognition, high levels of anxiety were expected to be related to high levels of problem recognition but low levels of treatment readiness. Alexithymia was expected to buffer the link between anxiety and problem recognition, such that anxiety would be associated with lower levels of problem recognition when alexithymia was high (i.e., due to difficulties describing or communicating problem emotions). Given that youth with high levels of alexithymia might feel unprepared to enter therapy (i.e., a setting where

identifying and communicating emotions is expected), it was expected that high levels of alexithymia would exacerbate the link between anxiety and low levels of treatment readiness.

Method

Participants

The current study used data from 111 youth (71.2% Male, 47.7% Caucasian, 24.3% African American, 18.9% Latino, 4.5% Native American/Alaskan Native, .9% other, and 3.6% Biracial) ranging from 11 to 17 years of age (M = 15.25, SD = 1.38) who were detained in a juvenile detention facility in a mid-sized community in the Midwest over the course of 16 months. Out of the 138 youth who entered the facility, a total of 116 participants provided assent (84% assent rate) for the data to be used for research purposes. Five participants were removed from analyses; 3 participants were adults who had been dishonest about their age at the time of booking into the facility; one participant provided invalid responses to the survey; and one participant had taken the survey twice. The majority of youth who were detained at this facility were awaiting a court date or were ordered to serve time in the facility. However, some of the youth in the facility had not been accused or charged with unlawful behavior prior to being detained but were referred to the facility as a child in need of care (CINC; n = 17 of the assented youth) typically due to violations of a court no-run order, or identified as an out of state runaway, or had a placement failure. Note that t-tests revealed no significant differences between youth classified as CINC and youth who had received a charge (i.e., not classified as CINC) for mean levels of anxiety, depression, problem recognition, treatment readiness, or age (p's >.05). Chi-square tests indicated that race (i.e., Caucasian vs. non-Caucasian) did not differ between groups, and the only significant group difference was based on gender (χ^2 (1) = 16.04, p<.001). Therefore, the entire sample was included in analyses. Although data on previous arrests was not collected by the facility, 31 of the youth (27.93%) were arrested for a probation violation.

The facility uses Positive Behavioral Supports in order to create a milieu that decreases problem behaviors. Examples include staff and juveniles working together to problem-solve, staff focusing on the prevention of behavior problems, and attending to positive behaviors rather than identifying youth's misbehaviors (e.g., Burke, Rispoli, Clemens, Lee, Sanchez, & Hatton, 2016). Youth behavior within the facility is managed through a token economy system where youth earn deposits into a checkbook balance for positive behaviors and are fined for undesirable behavior within the facility.

Measures

Measures can be found in Appendix A.

Demographics. Information regarding each youth's age, gender, and race were obtained from facility records. For the purposes of analyses, race was coded 0 = *Caucasian,* 1 = *Non-Caucasian*, and gender was coded as 0 = *Male,* 1 = *Female.*

Depressive Symptoms. Youth responded to 13 items from the Short Mood and Feelings Questionnaire (SMFQ; Angold et al., 1995). Youth reported on depressive symptoms they may have experienced in the past two weeks (e.g., *"I felt I was no good anymore", "I found it hard to think properly or concentrate"*) by rating each item as 0 = *Not True;* 1 = *Sometimes True;* or 2 = *True.* Mean scores were computed with higher scores indicating higher levels of depressive symptoms. Internal consistency for this measure was good (α =.92).

Anxiety Symptoms. Youth responded to 8 items of the PROMIS Anxiety subscale (PROMIS; Ader, 2007). Youth reported on anxiety symptoms they may have experienced in the past week related to fearfulness, worry, and hyperarousal (e.g., "*I felt like something awful might happen")*. Youth rated the frequency of their experience of each item on a 5-point Likert scale as 0 = *Never;* 1 = *Almost Never;* 2 = *Sometimes;* 3 = *Often;* 4 = *Almost Always.* Mean scores were computed with higher scores indicating higher levels of anxiety symptoms. Internal consistency for this measure was good (α = .89).

Alexithymia. Youth rated their difficulties in identifying and communicating emotions through the 20-item Toronto Alexithymia Scale (TAS; Bagby, Parker & Taylor, 1994). The TAS consists of three components: 1) Difficulty identifying feelings (e.g., *"When I am upset, I don't know if I am sad, frightened, or angry")*; 2) Difficulty describing feelings (e.g., "*People tell me to describe my feelings more"*); and 3) Externally-oriented Thinking (e.g., *"I prefer to just let things happen rather than to understand why they turned out that way"*). Participants rated their agreement with each item using a 5-point Likert scale as 1 = *Completely Disagree;* 2 = *Somewhat Disagree;* 3 = *Neither Agree nor Disagree;* 4 = *Somewhat Agree;* 5 = *Completely Agree.* Some items assessed for developed skills in identifying and communicating emotions, and were therefore reverse-coded (e.g., "*I am able to describe my feelings easily").* A mean alexithymia score was computed using all items on the TAS. Using a mean alexithymia score rather than the individual subscales is consistent with previous research using the TAS in the general adolescent population (e.g., Joukamaa et al., 2007) and in incarcerated juveniles (e.g., Snow et al., 2016; Zimmerman, 2006). Higher scores indicate greater difficulties in identifying and describing emotions. Internal consistency for this measure was acceptable ($\alpha = .72$).

Motivation for Treatment. Youth's motivation for treatment was assessed using the Motivation for Youth's Treatment Scale (MYTS; Breda & Riemer, 2012). The MYTS consists of 8 total items related to internal motivation for treatment; four items are related to problem recognition (e.g., "*My feelings are causing problems at home, school, with my friends or in other places"*) and an additional four items are related to treatment readiness (e.g., "*I want help finding solutions for my current problems"*). Youth responded to items by rating them on a 5-point Likert scale as 1 = *Strongly Disagree;* 2 = *Disagree;* 3 = *Neither Agree or Disagree*; 4 = *Agree*; 5 = *Strongly Agree.* Mean scores were computed for both subscales, with higher scores indicating greater treatment readiness and better problem-identification. Internal consistencies for this measure were good (problem recognition $\alpha = .83$ and treatment readiness $\alpha = .90$). This is consistent with previous

studies which have found good internal consistencies for problem recognition (α = .84) and treatment readiness (α = .86; Breda & Riemer, 2012).

Procedures

Study measures and procedures were approved by the researcher's Institutional Review Board and by the facility. The database used for the current study included de-identified youth behavioral and demographic information sent from the facility in addition to youth's responses to various measures assessing emotional and behavioral factors.

All youth completed measures as a part of the intake procedures. The facility director provided consent for all participants' data to be used for research, as legal custody had been given to the court upon the youth's admission to the facility. Youth assent was also necessary for responses to the survey to be used for research. Youth provided assent at the end of the survey administration.

All measures were administered by a trained research assistant who held at least a Bachelor's degree. Research assistants typically administered measures within 24 hours of youth's detention in the facility. The survey data was collected over a sixteen-month period. In order to ensure reliability of study procedures and data collected, all research assistants underwent data collection training and were also observed completing an interview by the study coordinator prior to administering surveys independently. Research assistants followed a protocol for survey administration, which included standardized instructions and response options read to the youth for each measure. Trained research assistants read aloud survey items as youth followed along with a paper copy of the survey and verbally provided answers for each item. Research assistants entered participants' survey responses directly into an online version of the survey on a laptop. Facility staff monitored youth through a window in the survey administration room but were unable to hear youth's responses to the survey items. Each survey administration was completed in approximately 15 minutes.

An additional research assistant simultaneously entered responses during interviews for a total of five participants in order to assess for reliability of recording responses into the computer. Reliability was calculated to be approximately 99% (i.e., a total of 7 discrepancies out of a total of 665 entries between research assistants) for these five survey administrations. From this sample of five participants, it can be assumed that responses were being entered accurately into the laptop during individual administration of surveys.

Of note, previous research has suggested that the language in the TAS requires an advanced reading level (i.e., Parker, Eastabrook, Keefer, & Wood, 2010) and may require adaptations to be used in adolescent populations, particularly with incarcerated juveniles who typically have lower verbal abilities (i.e., Kroner & Forth, 1995). The present study methodology allowed for participants to ask questions about survey items, and also allowed for youth to follow along on a hard copy of survey items as research assistants read aloud items to them, with the goal to improve comprehension on items.

Data Analytic Plan

Descriptive Statistics

Means and standard deviations were first evaluated in order to assess for the levels of depression, anxiety, alexithymia, and treatment motivation in the sample. Descriptive statistics and correlations were conducted using SPSS (IBM SPSS Statistics for Windows, Version 25.0). Correlations were also used to assess the bivariate associations between study variables; r-values of .10 are considered small effects, r-values of .30 are considered medium effects, and r-values of .50 or greater are considered large effects (Cohen, 1988).

Exploratory Factor Analyses

Given that both anxiety and depressive symptoms are associated with negative affectivity, an EFA measured whether items on the PROMIS and SMFQ measure separate constructs (i.e.,

depression and anxiety) rather than just measuring negative affectivity or internalizing symptoms as a whole. These analyses were conducted using RStudio (RStudio Version 3.5.1). All variables were standardized prior to being entered into the model, in order to aid in interpretation. Due to the ordinal response nature of the variables, General Least Squares estimation was used in performing analyses. Root Mean Square Error of Approximation (RMSEA), Standardized Root Mean Square Residual (SRMR) and the Comparative Fit Index (CFI) were used as measures of goodness of fit. Adequate model fit was determined by a RMSEA value of .06 or lower, a SRMSR value of .08 or lower, and a CFI value of .95 or greater (i.e., Brown, 2014). Values of factor loadings further assessed the model fit using Wald statistics and their p-values (Brown, 2014). Tabachnick and Fidell (2007) suggest that factor loadings should be at least .32. Models were also assessed for the proportion of variance explained by each factor and the reliability of each factor. Factors are considered reliable when four or more variables have loadings of .6 (i.e., Stevens, 2002). It was hypothesized that an EFA that included all items from the PROMIS and SMFQ would produce a two-factor solution. However, a parallel analysis was first conducted to produce alternative models that may fit the data.

Confirmatory Factor Analyses

All CFA analyses were conducted using RStudio (RStudio Version 3.5.1). A Confirmatory Factor Analysis (CFA) was performed on participants' responses on the SMFQ and PROMIS Anxiety subscale in order to evaluate the measurement of depression and anxiety in the current sample. Since a unifactorial model was found in previous studies of depression in both community and juvenile offender populations (i.e., SMFQ; Kuo et al., 2005) and anxiety in community samples (i.e., PROMIS Anxiety subscale; Ader, 2007), the CFA for both depression and anxiety was expected to also support a unifactorial model. Analyses were performed using Weighted Least Squares Estimation due to the ordinal nature of response choices to items of both the PROMIS Anxiety subscale and SMFQ. Further, variables were specified as "ordered" in the model syntax to indicate

that response choices were ordinal. All items were standardized prior to being entered into the model, and latent variables were allowed to freely correlate. Root Mean Square Error of Approximation (RMSEA), Standardized Root Mean Square Residual (SRMR) and the Comparative Fit Index (CFI) were used as measures of goodness of fit. Adequate model fit was determined by a RMSEA value of .06 or lower, a SRMSR value of .08 or lower, and a CFI value of .95 or greater (i.e., Brown, 2014). However, it should be noted that RMSEA may be inflated in smaller sample sizes and may not provide the best indicator of model fit with smaller samples (e.g., Curran, Bollen, Chen, Paxton, & Kirby, 2003; Hu and Bentler, 1999). Next, values of factor loadings assessed the model fit using Wald statistics and their p-values (Brown, 2014). Previous research has demonstrated factor loadings of .43 to .78 in a CFA of incarcerated juveniles for the SMFQ and .40-.77 in community samples (e.g., Kuo et al., 2005). Similarly, previous research on the PROMIS Anxiety scale has demonstrated factor loadings of .44-.76 in school and medical settings (i.e., Irwin et al., 2010).

Path Analyses

Analyses for the path model were conducted using RStudio (RStudio Version 3.5.1). All variables were standardized prior to model estimation. A first-order effects path model was first estimated with both treatment readiness and problem recognition identified as dependent variables. The models assessed symptoms of depression and symptoms of anxiety simultaneously in order to evaluate unique associations. Problem recognition and treatment readiness were regressed onto depressive and anxiety symptoms, alexithymia, and the control variables (i.e., age, gender, and race). Age, gender, and race were evaluated as control variables in the model, as there is evidence to suggest that treatment motivation may be influenced by these variables (Breda & Heflinger, 2004; Breland-Noble, Burriss, Poole, & AAKOMA Project Adult Advisory Board, 2010; Breda & Riemer, 2012). Specifically, youth who identify as Caucasian report higher levels of treatment motivation compared to youth who are ethnic minorities (Breland-Noble et al., 2010). Older youth are more

likely to have higher levels of treatment motivation, possibly due to the length of time they have been managing their emotional or behavioral problems (Breda & Heflinger, 2004). In terms of gender, females typically display higher levels of help seeking behavior, leading to high levels of both treatment readiness and problem recognition (Breda & Riemer, 2012).

The multiplicative interaction terms between depression x alexithymia and anxiety x alexithymia were then added to the first-order effects model. Interactions were added one at a time for power considerations. Note that mean scores of all variables were used to compute path analyses, rather than using solutions produced through the CFA as the current study aimed to provide direct clinical implications regarding treatment motivation for youth who may have high scores on measures used in the study. Clinicians or facility staff who hope to infer levels of treatment motivation from youth's scores on the SMFQ, PROMIS, or TAS will likely use mean scores on measures to do so, as it would be impractical to conduct CFA analyses for each youth who is administered these measures within a clinical setting.

With regard to model estimation, there was less than 10% missing data in the present database. Values indicating non-normality of data were not of concern for the current study (i.e., values across variables ranging from –2 to +2 and –3 to +3, respectively; Cohen, Cohen, West, & Aiken, 2003). Accordingly, Full Information Maximum Likelihood (FIML) estimates were used for path models. FIML uses all data available in the dataset, even with cases that have some missing data (Kline, 2015) and has been found to be less biased than other methods such as listwise deletion (Arbuckle, 1996).

Statistical Power

Previous research has suggested that small sample sizes can be used in factor analyses when commonalities are high (i.e., around .5 for sample sizes of 100-200 participants; MacCallum, Widaman, Zhang, & Hong, 1999), and that a sample size as low as 50 participants can be used to

conduct a CFA (i.e., Sapnas & Zeller, 2002) when communalities are greater than .6 and have well-defined factors, which is the case for the measures for the current study. For both the SMFQ and for the PROMIS Anxiety subscale, items have been shown to highly covary and factor loadings are high (e.g., Irwin et al., 2010; Kuo et al., 2005).

Sample size recommendations for SEM indicate at least 100 participants, and ideally at least 200, unless the population is restricted in size (i.e., Kline, 2015). Due to the stringent ethical guidelines on performing research on incarcerated populations as well as the small proportion of the adolescent population that is incarcerated, the population used in the current study may be considered one that is restricted in size. We note, however, previous studies on delinquency and offending in youth with similarly sized samples have had adequate power to detect medium to large effects (e.g., DiPierro, Fite, Cooley, & Poquiz, 2016; dos Santos, Alberto, & Marques, 2016).

Further, simple path model estimates are equivalent to ordinary least square estimates (e.g., Kline, 2015). As such, power to detect interaction effects are similar across techniques and statisticians recommend computing power-based regression models (e.g., Bernstein, 2008). Regression tables were consulted to predict the size of the interaction effect that could be detected given the study sample size (Aiken, West & Reno, 1991). When items are moderately correlated, a sample size of 122 is required for medium effects, and a sample size of 59 is needed for large effects with power of .80 (Aiken, West, & Reno, 1991). Accordingly, the current sample was powered to detect medium to large interaction effects.

Previous research on the link between difficulties in emotional processing (i.e., factors including alexithymia) and anxiety and depressive symptoms in youth have reported medium effect sizes (i.e., Sendzik, Schafer, Samson, Naumann, & Tuschen-Caffier, 2017). Medium to large effects have been reported in previous research examining treatment motivation in youth experiencing anxiety (i.e., Fjermestad et al., 2017). In treatment-seeking youth, studies on treatment motivation

have reported medium effects (i.e., Karver, Handelsman, Fields, & Bickman, 2005). Thus, there is some evidence to support power to detect effects in the current sample.

Results

Descriptive Statistics

Means and standard deviations are reported in Table 1 in order to provide descriptive levels of symptoms of depression and anxiety as well as levels of alexithymia and treatment motivation in the sample.

Table 1. Descriptive Statistics and Correlations

	1	2	3	4	5	6	7	8
1. Age	-	-	-	-	-	-	-	-
2. Gender	.05	-	-	-	-	-	-	-
3. Race	-.08	.02	-	-	-	-	-	-
4. Anxiety	.01	.12	-.12	-	-	-	-	-
5. Depression	-.03	.14	-.01	.68**	-	-	-	-
6. Alexithymia	-.08	-.01	.04	.39**	.45**	-	-	-
7. Treatment readiness	-.04	.08	.05	.27**	.27**	.10	-	-
8. Problem recognition	.06	.11	-.03	.67**	.69**	.49**	.34**	-
Mean	15.50	-	-	1.42	.55	2.62	3.05	3.08
Std. Deviation	1.38	-	-	1.06	.51	.54	1.22	1.03

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

Using a cutoff score of SMFQ total ≥10 (Kuo et al., 2005), 25.2% of youth reported elevated depressive symptoms. This rate is slightly lower, but similar to previous research using the SMFQ in incarcerated juveniles, where a previous study reported that 32.1% of incarcerated juveniles scored at

least a 10 on the SMFQ (Kuo et al., 2005). Using a cutoff score of PROMIS total ≥16 (e.g., Irwin et al., 2010), 29.7% of youth reported elevated symptoms of anxiety. In terms of treatment motivation, youth reported moderate levels of both treatment readiness (M = 3.05, SD = 1.22) and problem recognition (M = 3.08, SD = 1.03), with most youth indicating that they "Neither Agree or Disagree" or "Agree" with statements related to both problem recognition and treatment readiness.

Correlation analyses indicated large, positive associations between anxiety symptoms and depressive symptoms (See Table 1). There were large, positive associations between both anxiety and depression and problem recognition, and small, positive associations between anxiety and depression and treatment readiness. Levels of anxiety and depression also demonstrated medium, positive associations with levels of alexithymia. There were also medium, positive associations between alexithymia and problem recognition, and between treatment readiness and problem recognition. Alexithymia was not statistically associated with treatment readiness. Age, race, and gender were not statistically associated with any study variable.

Exploratory Factor Analyses

An Exploratory Factor Analysis (EFA) was estimated using all items from the SMFQ and PROMIS Anxiety subscale in order to assess whether items loaded onto two separate factors. A parallel analysis extraction indicated a three-factor solution for the combined PROMIS and SMFQ items. Oblique rotation was used to aid in interpretation and to allow items to correlate, as anxiety and depression are distinct, but related constructs. See Table 2 for factor loadings and communalities. Loadings that are ≥ .32 are denoted in bold font.

Table 2. Exploratory Factor Analysis of the Three-Factor Model with Oblique Rotation

Item	Factor 1	Factor 2	Factor 3	Communalities
MFQ 1	**.42**	**.38**	.27	.62
MFQ 2	**.43**	.17	.30	.43
MFQ 3	**.31**	.04	.21	.17
MFQ 4	**.37**	.13	**.37**	.38
MFQ 5	**.94**	-.11	-.03	.77
MFQ 6	**.48**	.24	-.21	.46
MFQ 7	**.50**	.15	**.40**	.56
MFQ 8	**.75**	.05	-.10	.60
MFQ 9	**.68**	.04	.14	.54
MFQ 10	**.66**	.10	.03	.55
MFQ 11	**.79**	-.05	-.01	.58
MFQ 12	**.67**	.12	-.05	.55
MFQ 13	**.89**	-.01	-.01	.78
PROMIS 1	.12	**.64**	.17	.55
PROMIS 2	.04	**.75**	.00	.60
PROMIS 3	.25	**.59**	**-.36**	.71
PROMIS 4	-.06	**.87**	.04	.70
PROMIS 5	.03	**.49**	.26	.33
PROMIS 6	.14	**.63**	**-.39**	.67
PROMIS 7	-.07	**.80**	.05	.57
PROMIS 8	.01	**.78**	.01	.62
Proportion Variance	.26	.20	.05	

Factor loadings for Factor 1 ranged from .31 - .94, loadings ranged from .38-.87 for Factor 2, and loadings ranged from .36-.40 for Factor 3. Factors 1 and 2, but not Factor 3, were considered reliable. Further, the majority of items had cross-loadings on one or more factors, with several of the cross-loadings greater than or equal to .3. Communalities ranged from .17 to .78; however, most communalities were greater than .50 (See Table 2). The proportion of variance explained by each factor was highest for Factors 1 and 2 (26% and 20%, respectively), and was much lower for Factor 3 (5%). Fit indices indicated adequate fit to the data (RMSEA = .08, TLI = .91), and the chi-squared test was significant ($\chi^2 = 287.86$, $p < .001$). While the three factors capture 51% of the cumulative variance observed by the 21 factors, given the modest amount of variance explained for Factor 3, and significant number of cross-loadings in the model, alternate factor solutions were examined.

A two-factor solution using all 21 PROMIS and MFQ items was examined next. See Table 3 for all factor loadings and communalities. Loadings that are ≥ .32 are denoted in bold font.

Table 3. Exploratory Factor Analysis of the Two-Factor Model with Oblique Rotation

Item	Factor 1	Factor 2	Communalities
MFQ 1	**.57**	.25	.57
MFQ 2	**.59**	.03	.38
MFQ 3	**.42**	-.06	.15
MFQ 4	**.58**	-.04	.30
MFQ 5	**.91**	-.09	.73
MFQ 6	**.36**	**.34**	.40
MFQ 7	**.72**	-.04	.47
MFQ 8	**.68**	.10	.56
MFQ 9	**.75**	-.02	.54
MFQ 10	**.67**	.09	.54
MFQ 11	**.77**	-.03	.56
MFQ 12	**.62**	.15	.53
MFQ 13	**.86**	.01	.75
PROMIS 1	.22	**.55**	.51
PROMIS 2	.05	**.74**	.60
PROMIS 3	.05	**.75**	.62
PROMIS 4	-.02	**.84**	.68
PROMIS 5	.18	**.36**	.25
PROMIS 6	-.07	**.81**	.58
PROMIS 7	-.03	**.76**	.55
PROMIS 8	.03	**.76**	.61
Proportion Variance	.28	.21	

While cross-loadings were evident for some items, only one exceeded a factor loading of .25 (i.e., the sixth item on the SMFQ had a loading of .36 on Factor 1 and .34 on Factor 2). Therefore, factors that were .3 or greater were retained as loading onto the respective factor. With the exception of the sixth item (i.e., “I cried a lot”), items from the SMFQ loaded onto Factor 1, with loadings ranging from .42-.91. Similarly, all items from the PROMIS loaded onto Factor 2, with loadings ranging from .36-.84. Factor 1 explained 28% of the variance, and Factor 2 explained 20% of the variance, and both factors were considered reliable. Communalities ranged from .15-.75. Model fit

indices indicated modest fit to the data (RMSEA = .09, TLI = .88), and the chi-squared test was significant ($\chi^2 = 287.86$, $p < .001$).

While model fit indices indicated that the three-factor model may have demonstrated a slightly better fit to the data, the two-factor model still provided an adequate fit to the data with factor loadings above .32 and increased the face validity of the model. For instance, the factors which loaded onto Factor 3 for the three-factor model included items that did not appear to have similar constructs (e.g., felt scared, got scared really easily, very restless, found it hard to think properly or concentrate), and their factor loadings ranged from .36-.40. Further these four items had cross-loadings and demonstrated higher loadings on Factor 1 or Factor 2 (i.e., .37 - .63). Thus, a two-factor solution was preferred over a three-factor solution.

In order to address the possibility of all 21 items loading onto a single factor (e.g., representing underlying negative affectivity), an EFA was conducted using GLS estimation and oblique rotation for a single-factor solution. See Table 4 for all factor loadings and communalities.

Table 4. Exploratory Factor Analysis of the One-Factor Model with Oblique Rotation

Item	Factor 1	Communalities
MFQ 1	.75	.57
MFQ 2	.59	.35
MFQ 3	.34	.12
MFQ 4	.51	.26
MFQ 5	.78	.61
MFQ 6	.63	.40
MFQ 7	.64	.41
MFQ 8	.73	.53
MFQ 9	.69	.47
MFQ 10	.71	.51
MFQ 11	.69	.48
MFQ 12	.72	.51
MFQ 13	.82	.67
PROMIS 1	.69	.47
PROMIS 2	.70	.48
PROMIS 3	.71	.50
PROMIS 4	.72	.51
PROMIS 5	.49	.24
PROMIS 6	.64	.41
PROMIS 7	.64	.41
PROMIS 8	.69	.48
Proportion Variance	.45	

Factor loadings ranged from .34-.82, and sum of square loading was 9.43. The single factor explained 45% of the variance in the model. Communalities ranged from .12 to .67 and the single factor could be considered reliable with the majority of factor loadings greater than .60. Upon examining model statistics (i.e., RMSEA = .12, TLI =.76), factor loadings, communalities, and significant chi-squared test ($\chi^2 = 450.65$, $p < .001$), it can be concluded that a model with additional factors provided a better fit to the data. Therefore, the two-factor solution was retained for the current study, with the SMFQ items loading onto one factor, and the PROMIS Anxiety scale items loading onto another factor. Further, it could be concluded that the SMFQ items and the PROMIS Anxiety items do measure distinct constructs rather than just measuring shared constructs such as internalizing symptomatology or negative affectivity.

Confirmatory Factor Analysis

CFAs were performed on youth's responses on the SMFQ and PROMIS Anxiety subscale in order to evaluate the measurement of depression and anxiety in the current sample. All CFA analyses were performed using RStudio using the lavaan package (RStudio Version 3.5.1).

Short Mood and Feelings Questionnaire. The CFA for the SMFQ included data from 111 youth and had no missing data. Global fit indices demonstrated that the unifactorial model of the SMFQ provided a very good fit to the data (CFI = 1.00, TLI= 1.00, RMSEA = .000, SRMR = .07). All factor loadings were significant and ranged from .44 - .95 ($p < .001$). See Table 5 for all factor loadings.

PROMIS Anxiety Subscale. A CFA was performed on all 8 items of the PROMIS Anxiety subscale. It was hypothesized that all items would load onto a single factor and that a unifactorial model would provide a good fit to the data. Three cases were removed due to missing data on one item of the PROMIS; there was no other missing data. Therefore, the CFA for the PROMIS Anxiety subscale included data from 108 youth. Items were constrained to a one-factor model. Global fit indices demonstrated that the unifactorial model of the PROMIS Anxiety subscale provided a good fit to the data (CFI = .996, TLI= .995, RMSEA = .075, SRMR = .065). Factor loadings for the PROMIS Anxiety Subscale ranged from .61-.91. and all were significant ($p<.001$; Table 6).

Table 5. Confirmatory Factor Analysis of the Short Mood and Feelings Questionnaire

	Standardized Factor Loading	
Item	**SMFQ**	**Standard Error**
MFQ 1	.84***	.05
MFQ 2	.70***	.07
MFQ 3	.44***	.09
MFQ 4	.61***	.08
MFQ 5	.95***	.03
MFQ 6	.72***	.08
MFQ 7	.78***	.05
MFQ 8	.87***	.04
MFQ 9	.80***	.06
MFQ 10	.83***	.04
MFQ 11	.88***	.04
MFQ 12	.82***	.05
MFQ 13	.94***	.02

*$p<.05$ ** $p<.01$ ***$p<.001$

Table 6. Confirmatory Factor Analysis of the PROMIS Anxiety Subscale

	Standardized Factor Loading	
Item	**PROMIS**	**Standard Error**
PROMIS 1	.75***	.05
PROMIS 2	.83***	.03
PROMIS 3	.85***	.03
PROMIS 4	.89***	.03
PROMIS 5	.61***	.08
PROMIS 6	.91***	.04
PROMIS 7	.80***	.04
PROMIS 8	.81***	.04

*$p<.05$ ** $p<.01$ ***$p<.001$

Path Analyses

A first-order effects path model was first estimated with both treatment readiness and problem recognition identified as dependent variables. Problem recognition and treatment readiness were regressed onto depressive and anxiety symptoms, alexithymia, and the control variables (i.e., age, gender, and race). The model assessed symptoms of depression and symptoms of anxiety simultaneously in order to evaluate unique associations. Path models were fully saturated; therefore,

model fit was not assessed via global fit indices, however, paths in the model were examined to address the study's hypotheses. Higher levels of depression (B = .37, p <.001), higher levels of anxiety (B = .35, p<.001), and higher levels of alexithymia (B =.19, p <.001) were linked to higher levels of problem recognition (see Figure 2). However, age, race, and gender were not linked to levels of problem recognition (p's > .05). None of the study variables were statistically associated with treatment readiness (p's > .05).

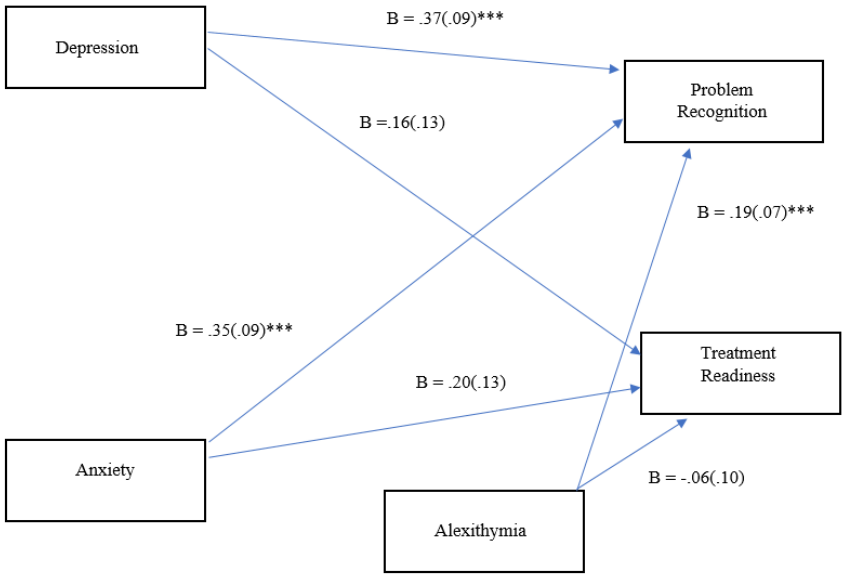

Figure 2. First-Order Effects Path Model

Note: First-order effects reported are standardized estimates.
*p < .05, **p < .01, ***p < .001

Another set of path models were specified to examine the potential moderating role of alexithymia. The multiplicative interaction terms between depressive symptoms x alexithymia and anxiety symptoms x alexithymia were then added to the first-order effects model. Interactions were added one at a time for power considerations. First, the interaction term between depressive

symptoms and alexithymia was added to the first-order model (see Table 7). The interaction term was not significant for either problem recognition (β= -.03, *p*>.05) or treatment readiness (β = -.09, *p* >.05).

Table 7. Interaction Model Assessing the Link between Depression and Treatment Motivation

	Problem Recognition		Treatment Readiness	
Predictor	*β*	*SE*	*B*	*SE*
Age	.09	.06	-.02	.09
Gender	.02	.06	.05	.09
Race	.02	.06	.07	.09
SMFQ Mean	.37***	.09	.18	.13
PROMIS Mean	.35***	.09	.20	.13
TAS Mean	.20**	.07	-.04	.10
SMFQ x TAS	-.03	.06	-.09	.08

Note. Gender (0 = Males; 1 = Females). Race (0 = White, 1 = Non-White)
**p < .05, **p < .01, ***p < .001*

Next, in a separate model, the interaction term between anxiety symptoms and alexithymia was added to the first-order effects model (see Table 8). However, there was not a significant interaction between anxiety symptoms and alexithymia for problem recognition (β = -.05, *p* > .05) or treatment readiness (β = -.08, *p* > .05).

Table 8.Interaction Model Assessing the Link between Anxiety and Treatment Motivation

	Problem Recognition		Treatment Readiness	
Predictor	*β*	*SE*	*β*	*SE*
Age	.09	.06	-.02	.09
Gender	.02	.06	.04	.09
Race	.02	.06	.08	.09
SMFQ Mean	.37***	.09	.17	.13
PROMIS Mean	.35***	.09	.20	.13
TAS Mean	.20**	.07	-.05	.10
PROMIS x TAS	-.05	.06	-.08	.09

Note. Gender (0 = Males; 1 = Females). Race (0 = White, 1 = Non-White)
**p < .05, **p < .01, ***p < .001*

Additional Analyses

Follow-up analyses regarding the first-order effects model and interaction models were conducted considering the impact of anxiety and depression on treatment motivation separately. That is, separate first-order and interaction models were estimated without controlling for the symptoms of other internalizing symptomology (e.g., models assessing the effects of depression did not control for symptoms of anxiety) and vice versa.

In the first-order effects path model for depression, problem recognition and treatment readiness were regressed onto depressive symptoms, alexithymia, and the control variables. Higher levels of depression (B = .58, p <.001) and higher levels of alexithymia (B =.24, p =.002) were linked to higher levels of problem recognition. Higher levels of depressive symptoms were linked to higher levels of treatment readiness (B = .29, p = .006). Levels of alexithymia were not statistically associated with treatment readiness (B = -.04, p =.72). Age, race, and gender were not linked to levels of problem recognition or treatment readiness (p's > .05). The interaction term of depression x

alexithymia was not significant when added to the model for either problem recognition (β = -.04, *p* = .55) or treatment readiness (β = -.10, *p* = .23).

In a separate first-order effects path model, problem recognition and treatment readiness were regressed onto anxiety symptoms, alexithymia, and the control variables. Higher levels of anxiety (B= .57, *p*<.001) and higher levels of alexithymia (B= .27, *p*<.001) were significantly associated with problem recognition. Higher levels of anxiety (B = .30, *p* = .003), but not levels of alexithymia (B = -.03, *p* = .80), were significantly associated with higher levels of treatment readiness. Age, race, and gender were not linked to levels of problem recognition or treatment readiness (*p's* > .05). When the interactive term of anxiety x alexithymia was added to the model, the interaction was not significant for problem identification (β = -.04, *p* = .52) or treatment readiness (β = -.08, *p* = .38).

Items from the PROMIS and SMFQ loaded onto separate factors in the EFA of all 21 items, suggesting that the PROMIS and SMFQ measure distinct constructs. However, the correlation between mean scores of the PROMIS and SMFQ (*r* =.68) suggests strong overlap. The current pattern of regression findings suggests that specific symptomatology of anxiety and depression are both uniquely contributing to problem recognition. However, the link between anxiety and depression on treatment readiness may have instead been obscured by the shared variance between anxiety and depression (i.e., negative affectivity).

Discussion

The current study contributes to the literature by being the first to assess the factor structure of the PROMIS in a sample of incarcerated juveniles and has replicated findings of the factor structure of the SMFQ in incarcerated juveniles found in previous research (i.e., Kuo et al., 2005). The study also contributes to the literature on treatment motivation in incarcerated juveniles by evaluating the impact of anxiety and depressive symptoms on treatment motivation and examined the moderating effect of alexithymia.

Measures within the Detained Sample

Findings from the study suggest that the SMFQ and PROMIS provide a reliable measure of anxiety and depressive symptoms in the sample and assess related but separate constructs, evidenced by an EFA of all items producing a two-factor solution. Further, individual CFAs of each measure produced a unifactorial solution, which is also consistent with study hypotheses and with previous, but limited, research on both measures (i.e., Irwin et al., 2010; Kuo, , 2005). All items in each respective CFA had significant factor loadings and global fit indices, demonstrating that the unifactorial model for both the PROMIS and SMFQ provided a good fit to the data and demonstrated good construct validity within the sample.

Internalizing Symptoms and Problem Recognition

Higher levels of depressive symptoms were expected to be linked to lower levels of problem recognition. Contrary to hypotheses, levels of depressive symptoms were positively linked to levels of problem recognition when symptoms of depression were assessed independently of symptoms of anxiety in the path model. Moreover, depressive symptoms were robustly linked to problem recognition, as the effect was evident even when controlling for anxiety symptoms. It was expected that higher levels of anxiety symptoms would be linked to higher levels of problem recognition when assessed independently of symptoms of depression in the path model. As hypothesized, symptoms of anxiety were positively linked to levels of problem recognition when assessed independently of depressive symptoms. Further, anxiety symptoms were robustly linked to problem recognition, as the effect remained even when controlling for depressive symptoms.

The literature on the link between internalizing symptoms and levels of treatment motivation present with mixed findings; however, some research suggests that higher levels of symptomology are linked to higher levels of treatment motivation (e.g., Breda & Reimer, 2012; Yeterian et al., 2013), as found in the current study. Findings suggest that incarcerated juveniles who experience

anxiety and depression may be able to identify that their feelings or behaviors are impairing and causing problems, evidenced by the unique effects of anxiety and depressive symptoms on problem recognition. Reasons why youth who reported symptoms of depression also reported high levels of problem recognition is an area for future research. It is likely that hopelessness and help negation, both common in youth who experience depression, are not fully responsible for explaining potential links between depression and low treatment motivation in incarcerated juveniles (e.g., Wilson & Deane, 2010). Instead, the consequences of being arrested may have led youth to recognize that their behaviors and emotions are causing significant problems, in spite of any feelings of hopelessness or help negation.

In terms of anxiety, it was hypothesized that mechanisms underlying anxiety, such as rumination (Dickson et al., 2012) may help youth recognize that their feelings or behaviors that are causing problems, thus increasing their levels of problem recognition. Given that study findings supported the hypothesis that high levels of anxiety would be positively associated with problem recognition, rumination may be a reason why higher levels of anxiety were linked to higher levels of problem recognition. Future research examining the mechanisms involved, such as rumination, will be an important next step.

Internalizing Symptoms and Treatment Readiness

Both depressive and anxiety symptoms were expected to be linked to lower levels of treatment readiness. Contrary to hypotheses, both higher levels of depressive symptoms and higher levels of anxiety symptoms were positively linked to treatment readiness when assessed independently of symptoms of the other disorder.

While previous literature suggests that traits commonly associated with depression, such as hopelessness, may lead poor judgment and decision-making, and thus a lack of help-seeking behavior (e.g., Wilson & Deane, 2010), the results of the current study are not consistent with this body of

literature. However, findings are consistent with literature regarding the link between severe internalizing symptoms and treatment motivation, suggesting that higher levels of internalizing symptomology are linked to higher levels of treatment motivation (i.e., Breda & Riemer, 2012).

The literature on anxiety and treatment motivation is not as clear (e.g., Wilson & Deane, 2010). It was hypothesized that higher levels of anxiety would be linked to lower levels of treatment readiness due to mechanisms underlying anxiety including avoidance (e.g., Olatunji et al., 2010; Rood et al., 2010). However, findings are consistent with some literature on anxiety and treatment motivation, which has found that youth who experience anxiety may be more likely to desire change and seek treatment (i.e., Thompson et al., 2004).

However, there were no unique effects of anxiety or depressive symptoms on treatment readiness when controlling for the other internalizing disorder in the model. In this model, the shared variance (i.e., negative affectivity) between symptoms of depression and anxiety led to the absence of unique effects. Therefore, specific symptomatology (i.e., anxiety vs. depression) did not impact levels of treatment readiness. Future research is needed to clarify the role of negative affectivity and to confirm the reasons why there was no statistical link to treatment readiness when one internalizing disorder was assessed in the path model, while controlling for the effects of the other disorder.

It is also likely that treatment readiness involves a more advanced desire for change compared to the ability to recognize that feelings or behaviors are causing problems. The stages of change model suggests that taking steps to change problem behaviors happens after an individual recognizes that their behavior is causing difficulties (e.g., Prochaska & DiClemente, 1982). The first stage of change, precontemplation, involves a lack of problem recognition. The second stage of change, contemplation, involves acknowledgement of problem behavior and consideration of behavior change. In the next stage, preparation, the individual intends to take immediate action to change problem behaviors. This stage is followed by increasing commitment and action toward behavior change (i.e., the stages of action and maintenance).

Further, the findings regarding treatment readiness are supported by other literature on treatment motivation, suggesting that higher levels of psychological distress are linked to treatment motivation, but not linked to a desire to find solutions to problems (i.e., Yeterian et al., 2013). In a study by Yeterian et al. (2013), substance-using youth who were involved with the justice system were aware that their substance use was causing problems and were aware of potential legal consequences; however, their involvement within the justice system did not necessarily make them more likely to want to abstain from using substances. A study by Cohen et al. (2005) suggested that male offenders display indifference toward their existing problems. The authors suggest this may be due to a tendency for offenders to externalize blame, have poor problem recognition skills, or tend to be indifferent toward making change. Assessing youth's stage of change may be useful when implementing interventions or preparing youth to enter treatment.

Alexithymia

Alexithymia was expected to be associated with lower levels of both problem recognition and treatment readiness. Previous research suggests that levels of alexithymia are linked to difficulties communicating emotions and low levels of introspection, thus likely leading to poorer problem recognition and treatment readiness (e.g., Gatta et al., 2016). Contrary to expectations, higher levels of alexithymia were linked to higher levels of problem recognition in all first-order models (i.e., models that controlled for the other internalizing disorder and models which did not). However, individuals with high levels of alexithymia may experience a host of negative behaviors and emotions including internalizing problems (Angold et al., 2002), non-suicidal self-injury (Gatta et al., 2006), and behavioral problems (Manninen et al., 2011) and therefore are likely aware they are experiencing problems. Consistent with the literature, individuals with high alexithymia may provide more vague descriptions of their problems (e.g., da Silva, Vasco, & Watson, 2018) but are not necessarily in denial of their problems, thus supporting the link between high levels of alexithymia

and high problem recognition. However, levels of alexithymia were not linked to levels of treatment readiness in any first-order model; individuals with high levels of alexithymia may not necessarily be opposed to counseling, but they also do not express a high level of internal motivation which can be necessary for engagement in the therapeutic process (e.g., Breda & Riemer, 2012; DiClemente & Prochaska, 1998; McMurran et al., 2006).

Further, alexithymia did not moderate the effects of anxiety or depression on either treatment motivation outcome; the interaction was not significant when internalizing symptoms were assessed both simultaneously and independently of each other. This is contrary to study hypotheses and previous research which suggests that youth who have difficulties communicating their emotions may not recognize that their emotions or behaviors are causing problems and may also be less inclined to engage in therapy (i.e., in a setting where they would likely be asked to describe their emotions; Gatta et al., 2016). Given that youth had been arrested within 24 hours of completing the survey, it is likely that they could easily identify that their feelings or behaviors were causing problems. Therefore, it is possible that any deficits in identifying and communicating emotions did not become a barrier in having this insight. Of note, the ability to simply recognize that feelings or behaviors are causing problems (i.e., high levels of problem recognition) is a much different skill from identifying and labeling the specific emotions that cause difficulty, and knowing the best way to communicate these emotions to others (i.e., low levels of alexithymia). It might be that alexithymia does not necessarily help or hinder youth experiencing anxiety or depression from detecting the presence of problem emotions or behaviors.

It is also likely that links between internalizing symptoms and treatment motivation might instead be moderated by cognitive and behavioral deficits which are prevalent in detained juvenile populations including lower executive functioning (i.e., deficits in error processing and inhibition; Vilà-Balló, Hdez-Lafuente, Rostan, Cunillera, & Rodriguez-Fornells, 2014), impulsivity, and belief

in one's ability to reach set goals (Mahler, Simmons, Frick, Steinberg, & Cauffman, 2017). Future research examining other moderating factors is warranted.

Limitations

Findings of the study must also be considered in the context of the study's limitations. All youth who entered the facility were administered surveys during the 16-month data collection period. Previous literature on first-time incarcerated offenders is limited, though one study suggests that first-time incarcerated female offenders typically display lower levels of emotional and behavioral problems compared to youth who have been previously arrested (i.e., Tille & Rose, 2007). However, other literature suggests that the severity of the crime, previous mental health treatment, and length of time spent incarcerated can impact levels of emotional problems (e.g., Zeola, Guina, & Nahhas, 2017). Youth were not excluded from the study if they had been previously detained at the facility, or at any other facility. However, youth who re-entered the facility during these sixteen months did not take the survey again. Information regarding prior detainment was not available from the facility or collected by the research team. This may pose a limitation to the study, as youth who were previously detained were included in the same analyses as youth who had never been detained. Another limitation is that the sample is limited to one juvenile detention facility in a Midwestern town; replication is needed in juvenile detention facilities in other geographical locations and in other secure settings to improve external validity. The present study is cross-sectional, so causal associations cannot be assessed. The cross-sectional nature of the study also poses limits on the predictive validity of anxiety and depressive symptoms on treatment motivation throughout and after incarceration. Further, it is possible that youth's motivation for treatment may be different upon their release from the facility, compared to their initial intake. The current study was therefore unable to assess the predictive validity of the Motivation for Youth's Treatment Scale in the current population. Implementing follow-up surveys to measure levels of treatment motivation post-release

may be a useful future direction. Further, the statement that the study had power to detect medium to large effects was based off previous research examining direct effects, but not interaction effects. Therefore, no firm conclusions should be drawn regarding the study's power to detect medium to large effects.

Further, all measures used in the present study were self-report measures; therefore, shared method variance may have impacted study results (Orth, 2013). Another future direction could be collecting data from facility staff and parents on measures used in the present study. While the present study used validated measures that have been previously studied in youth, the study could not provide concurrent validity regarding the constructs studied, as a single measure was used each to assess for levels of anxiety, depression, alexithymia, and treatment motivation. Another limitation of study methodology is that baseline levels of anxiety and depression prior to incarceration were not available. Previous research suggests that incarceration can lead to a temporary increase in internalizing symptoms (White et al., 2010). Therefore, links amongst study variables may have been different had the study been conducted later into the youth's incarceration, or if the study assessed more chronic experiences of anxiety and depression.

Given that the demographic makeup of the sample was predominantly male and Caucasian, future research may consider the associations amongst study variables in populations that are predominantly female and/or ethnic minorities. Future research may also consider gender differences amongst study variables; however, the current study was unable to do so due to power limitations.

Implications and Future Directions

Overall, findings support the use of the SMFQ and PROMIS as internally-consistent, and valid measures of symptoms of depression and anxiety in incarcerated juveniles. Both measures demonstrate factor structures identical to what has been found in previous studies using the SMFQ and PROMIS in adolescents (i.e., Irwin et al., 2010; Kuo et al., 2005). The SMFQ and PROMIS can

be interpreted quickly and easily by facility staff by summing responses, which would produce a unifactorial measure of anxiety and depressive symptoms. Further, the process for administering the measures from the present study was similar to the ways in which youth are interviewed during their initial assessment during their intake into the facility (i.e., asked questions in an individual format). Therefore, the study provided an ecologically valid means of collecting data on youth that might be similar in format should facilities adopt these measures for part of their intake questionnaires. Facility staff and clinicians may consider administering both the SMFQ and PROMIS to identify youth's levels of internalizing difficulties. Both the SMFQ and PROMIS are free and validated measures, and therefore can provide a free and cost-effective means to measure depression and anxiety in incarcerated juveniles.

Findings further suggest that both depressive and anxiety symptoms are associated with high levels of treatment motivation, particularly problem recognition. Thus, individuals who endorse these symptoms may be aware but not actually ready for treatment. Motivational Interviewing may be a potential intervention to help youth progress through stages of change in order to enhance their readiness and overall motivation for treatment (Dean, Britt, Bell, Stanley, & Collings, 2016).

The current study did not find that the strength of the link between anxiety or depression and treatment motivation is dependent on levels of alexithymia; though, results suggest that higher levels of alexithymia may indicate greater problem recognition. However, no specific conclusions can be made regarding treatment readiness based off a youth's level of alexithymia.

Given that previous treatment is associated with higher levels of both problem recognition and treatment readiness (Breda & Riemer, 2012), controlling for prior treatment in this model will be an important future direction. Additional directions for research include examining other moderators related to emotional processing, such as emotional intelligence (e.g., Mayer, Salovey, & Caruso, 2004) or emotion reactivity (e.g. Nock, Weding, Holmberg & Hooley, 2008), which are also linked to symptoms of anxiety and depression and might impact treatment motivation. Previous research

suggests that there exist several external factors which might influence levels of treatment motivation, including previous experiences in treatment and parental motivation for their child's treatment (Breda & Reimer, 2012; Snyder, Glaser, & Calhoun, 2015). Understanding ways that these external factors may be linked to levels of problem recognition or treatment readiness can help contribute to the development of appropriate interventions to improve overall treatment motivation in incarcerated juveniles. While the current study was conducted due to the limited research on internalizing symptoms in incarcerated juveniles, it will be important to study the impact of externalizing disorders as a comparison or in addition to the role of internalizing disorders on levels of treatment motivation. Given that the current study was conducted during youth's incarceration, it will also be essential to understand the predictive validity of the MYTS after youth are released back into the community.

Further, from a preventative standpoint, since there were moderate to large associations between anxiety and depression and alexithymia, interventions aimed at reducing levels of alexithymia may help to decrease levels of internalizing symptoms and their negative sequalae in the population. Given that incarcerated juveniles experiencing anxiety and/or depression demonstrated problem recognition and treatment readiness, facility staff may find that youth are responsive to these interventions. Interventions that have been shown to decrease levels of alexithymia include Cognitive-Behavioral Therapy (e.g., Rufer et al., 2004; Rufer et al., 2010; Spek et al., 2008), and Alexithymia Reduction Treatment (ART; Levant, Hayden, Halter, & Williams, 2009), a psychoeducational treatment for males that targets male emotion socialization. While not specific to a particular intervention, providing validation for youth's experiences of emotions and helping them practice healthy ways to communicate emotions to others (e.g., through role play) is another way to help youth develop skills in identifying and communicating emotions to others (Ogrodniczuk, Sochting, Piper, & Joyce, 2012). In terms of decreasing levels of anxiety and depression, treatments such as group Cognitive-Behavioral Therapy (Townsend et al., 2010) and group social problem-

solving skills training (i.e., Biggam & Power, 2002) have been shown to be effective within adolescent offender populations. In adolescent outpatient samples, previous research supports the use of group and individual-based Cognitive-Behavioral Therapy interventions for both depression and anxiety, and Interpersonal Therapy for depression (Oar, Johnco, & Ollendick, 2017). Future research, however, is warranted on interventions that can feasibly be conducted within or adapted to a juvenile detention setting, in order to decrease internalizing symptoms and alexithymia and to promote treatment motivation and positive outcomes in incarcerated juveniles.

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Appendix

PROMIS (Ader, 2007)

Instructions: Please respond to each item by indicating one response per row.
In the past 7 days…

	Never	**Almost Never**	**Sometimes**	**Often**	**Almost Always**
1. I felt like something awful might happen.	0	1	2	3	4
2. I felt nervous.	0	1	2	3	4
3. I felt scared.	0	1	2	3	4
4. I felt worried.	0	1	2	3	4
5. I worried when I was at home.	0	1	2	3	4
6. I got scared really easy.	0	1	2	3	4
7. I worried about what could happen to me.	0	1	2	3	4
8. I worried when I went to bed at night.	0	1	2	3	4

Short Mood and Feelings Questionnaire (Angold et al., 1995)

Instructions: This form is about how you might have been feeling or acting **recently**. For each question, please indicate how you have been feeling or acting ***in the past two weeks***.

If a sentence was not true about you, indicate NOT TRUE.
If a sentence was only sometimes true, indicate SOMETIMES.
If a sentence was true about you most of the time, indicate TRUE.

	Not True	**Sometimes**	**True**
1. I felt miserable or unhappy.	0	1	2
2. I didn't enjoy anything at all.	0	1	2
3. I felt so tired I just sat around and did nothing.	0	1	2
4. I was very restless.	0	1	2
5. I felt I was no good anymore.	0	1	2
6. I cried a lot.	0	1	2
1. I found it hard to think properly or concentrate.	0	1	2
8. I hated myself.	0	1	2
9. I was a bad person.	0	1	2
10. I felt lonely.	0	1	2
11. I thought nobody really loved me.	0	1	2
12. I thought I could never be as good as other kids.	0	1	2
13. I did everything wrong.	0	1	2

Toronto Alexithymia Scale (Bagby, Parker & Taylor, 1994)

Instructions: Please respond to the following statements by indicating the extent to which you agree or disagree with them. Indicate the number that best represents your evaluation of the item.

	Completely Disagree	**Somewhat Disagree**	**Neither Agree nor Disagree**	**Somewhat Agree**	**Completely Agree**
1. I am often confused about what emotion I am feeling.	1	2	3	4	5
2. It is difficult for me to find the right words for my feelings.	1	2	3	4	5
3. I have physical sensations that even doctors don't understand.	1	2	3	4	5
4. I am able to describe my feelings easily.	1	2	3	4	5
5. I prefer to analyze problems rather than just describe them.	1	2	3	4	5
6. When I am upset, I don't know if I am sad, frightened, or angry.	1	2	3	4	5
7. I am often puzzled by sensations in my body.	1	2	3	4	5
8. I prefer to just let things happen rather than to understand why they turned out that way.	1	2	3	4	5
9. I have feelings that I can't quite identify.	1	2	3	4	5
10. Being in touch with emotions is essential.	1	2	3	4	5
11. I find it hard to describe how I feel about people.	1	2	3	4	5
12. People tell me to describe my feelings more.	1	2	3	4	5
13. I don't know what's going on inside me.	1	2	3	4	5
14. I often don't know why I am angry.	1	2	3	4	5
15. I prefer talking to people about their daily activities rather than their feelings.	1	2	3	4	5
16. I prefer to watch "light" entertainment shows rather than psychological dramas.	1	2	3	4	5

17. It is difficult for me to reveal my innermost feelings, even to close friends.	1	2	3	4	5
18. I can feel close to someone, even in moments of silence.	1	2	3	4	5
19. I find examination of my feelings useful in solving personal problems.	1	2	3	4	5
20. Looking for hidden meanings in movies or plays distracts from their enjoyment.	1	2	3	4	5

The Motivation for Youth's Treatment Scale (Breda & Riemer, 2012)

Instructions: Below are statements about how youths might feel about their lives and about counseling. For each statement, please think about how you CURRENTLY feel and indicate the response that best describes how much you agree or disagree with each one. There is no right or wrong answer.

	Strongly Disagree	**Disagree**	**Neither Agree nor Disagree**	**Agree**	**Strongly Agree**
1. My behavior is causing problems at home, school, with my friends, or in other places.	1	2	3	4	5
2. My behavior is making my life worse.	1	2	3	4	5
3. Some of my feelings are really bothering me.	1	2	3	4	5
4. I want help finding solutions for my current problems.	1	2	3	4	5
5. Getting counseling seems like a good idea to me.	1	2	3	4	5
6. If I attend counseling, I think my life will get better.	1	2	3	4	5
7. I want to get counseling OR I am getting counseling because I want to.	1	2	3	4	5
8. My feelings are causing problems at home, school, with my friends, or in other places.	1	2	3	4	5