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ON THE ASSOCIATIONS AMONG TRAUMA-RELATED DISTRESS, SYMPTOMS

OF DEPRESSION, RESILIENCY, SUICIDAL IDEATION, AND RURALITY-

URBANICITY AMONG ADOLESCENT PSYCHIATRIC INPATIENTS

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Idaho State University

A dissertation

submitted in partial fulfillment

of the requirements for the degree of

Doctor of Philosophy in the Department of Psychology

Idaho State University,

August 2017

To the graduate faculty:

The members of the committee appointed to examine the dissertation of

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RE: regarding study number IRB-FY2016-247 : Understanding multiple domains of psychological and interpersonal distress among undergraduates after stressful life events, PI: Christopher DeCou

Dear Mr. DeCou:

Thank you for your responses from a previous full-board review of the study listed above. These responses qualify for expedited review under OHRP guidelines. This is to confirm that I have approved your application.

Notify the HSC of any adverse events. Serious, unexpected adverse events must be reported in writing within 10 business days.

You may conduct your study as described in your application effective immediately. The study is subject to renewal on or before Feb 17, 2017, unless closed before that date.

Please note that any changes to the study as approved must be promptly reported and approved. Some changes may be approved by expedited review; others require full board review. Contact Tom Bailey (208-282-2179; email humsubj@isu.edu) if you have any questions or require further information.

Sincerely,

Ralph Baergen, PhD, MPH, CIF
Human Subjects Chair

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Abstract

Adolescent inpatients represent a particularly at-risk group who suffer high rates of

trauma exposure, victimization, and suicidality. Several studies conducted with youth in

the general population have assessed the association between symptoms of Posttraumatic

Stress Disorder (PTSD) and suicidality, though relatively few have evaluated the

association between trauma-related distress and suicidality above and beyond the

influence of depression, and no known studies have evaluated resiliency as a mediator of

this association among adolescent inpatients. This study hypothesized that there would be

an association between trauma-related distress, depression symptoms, and suicidal

ideation, and that this association would be mediated by resiliency. It was also

hypothesized that there would be conditional effects of gender, rurality, and past history

of suicide attempt. This study utilized a cross-sectional chart review design, and included

550 adolescent inpatients admitted for care at a public psychiatric hospital. Adolescents

completed self-report measures that included measures of trauma-related distress,

resiliency, and depression symptoms. Psychiatric and psychosocial history, as well as

demographic information were obtained from available health records. Hypotheses were

evaluated using structural equation modelling, which demonstrated a significant indirect

effect of trauma-related distress upon suicidal ideation via emotional reactivity, such that

the total effect of trauma-related stress upon suicidal ideation was positive. There was

also a significant direct effect of depression symptoms upon suicidal ideation, however

there was no indirect effect of depression via resilience, nor was there a direct effect of

trauma-related distress. Gender, rurality, and suicide attempt history did not demonstrate

significant conditional effects. These findings demonstrate the importance of trauma-

related distress and depression symptoms as predictors of suicidal ideation, including the

potential utility of emotional reactivity as a mediator of the association between trauma-related distress and suicidal ideation. Implications for research, clinical intervention, and policy are discussed.

Introduction

Attempted and completed suicide are compelling health problems that affect

many individuals, families, and communities in the United States and around the world

(World Health Organization [WHO], 2014). Approximately one million people complete

suicide worldwide per year (WHO, 2014), and there are estimated to be between 4 and 80

close relatives and friends that survive each suicide death that occurs (Berman, 2011).

The impact of attempted suicide is even greater, with approximately 25 attempts

occurring for each suicide death (Centers for Disease Control and Prevention [CDC],

2012). In this way, suicide has broad implications that transcend the specific tragedy of

an individual's death by suicide. Several researchers (e.g., Guttierez & Osman, 2008;

Joiner, 2005; 2010) have noted the importance of identifying risk and protective factors

that contribute to suicide and suicidal behaviors. This includes identification and

examination of specific domains of overlapping and intersecting risk that may exist for

certain at-risk populations, including rural (Chavez-Heranandez, & Marcias-Garcia,

2015) and adolescent sub-populations (CDC, 2014; Guttierez & Osman, 2008; Heilbron,

Goldston, Walrath, Rodi, & McKeon, 2012). Indeed, previous work (e.g., Guttierez &

Osman, 2008; McLaughlin et al., 2013) has identified specific patterns of suicide risk

among adolescents, as well as disparate rates among adolescents from rural populations.

The association between trauma-related distress and suicidality may be

particularly salient among adolescents, given the developmental implications of

suicidality in adolescence (e.g., Masten & Cicchetti, 2010; Guttierez & Osman, 2008),

coupled with the alarmingly high base rates of trauma exposure among adolescents in the

United States (McLaughlin et al., 2013). Several previous studies have demonstrated the

ways in which trauma-related distress, including symptoms of posttraumatic stress, are associated with suicidal thoughts and behavior. However, what is less clear is to what extent individual resiliency may mediate this association. This type of intervening variable may be especially relevant for suicidality in at-risk populations, including adolescents in general, and adolescent inpatients in particular.

Indeed, most psychiatric inpatient adolescents are hospitalized due to contemporary suicidal ideation and attempted or threatened suicidal and/or self-harming behavior (Fennig et al., 2005). Given the relevance of suicidal ideation in adolescence with regard to future suicide attempt, there is utility in approaching specific risk and protective factors related to suicidal ideation among adolescents, including the role of trauma-related distress, a known predictor of suicide and parasuicidal thoughts and behaviors within the general population of adults and adolescents and among adolescent inpatients in particular (Lipschitz, Winegar, Hartnick, Foote, & Southwick, 1999). The proposed study will explore how resiliency may serve as a protective factor with regard to the risk conferred by trauma-related distress, and extend previous work by including contextual (i.e., rurality-urbanicity) and conditional (i.e., gender) variables that may modify both the total effect of trauma-related distress upon suicidal ideation, as well as the indirect effect of trauma-related distress via resiliency.

Suicide Among Adolescents

In the United States, the rate of suicide for people aged 12 to 17 years from 2008 to 2013 was 4.22 suicide deaths per 100,000 people (CDC, 2008). Although this rate is lower than the rate of suicide for all ages in the United States during the same time period (i.e., 12.50 suicide deaths per 100,000 people), it is necessary to consider how suicidal

behavior and suicidal thoughts in adolescence may portend later episodes of suicidality, and ultimately lead to completed suicide in adolescence or adulthood. Thus, it is important to address risk factors that may precipitate suicidal thoughts, which may contribute to subsequent incidents of suicidal behavior. To be certain, acquired capability for completing suicide via physical and psychological provocation, including history of suicidal thoughts and suicide attempts, remains the strongest predictor of future suicidal behavior, as well as the strongest predictor of completed suicide relative to other aspects of suicide risk (Joiner, 2005; 2010). Concerning the prevalence of suicidal thoughts and parasuicidal behaviors (e.g., suicide attempt), a survey of a nationally representative sample of 13,583 American youth enrolled in 9th through 12th grades (i.e., Youth Risk Behavior Surveillance Survey) indicated that during the 12 months prior to data collection: 13.6% of youth reported having made a suicide plan, 8.0% of youth attempted suicide, and 2.7% of students made a suicide attempt that required medical attention (CDC, 2014). Similarly, in their study of 4,023 randomly sampled American adolescents, Waldrop and colleagues (2007) found that approximately one-fourth (i.e., 23.3%) of adolescents endorsed having ever seriously considered suicide (i.e., suicidal ideation), and approximately three percent endorsed lifetime histories of suicide attempt. The proposed study will seek to assess multiple risk factors within the context of contextual and conditional variables that may predict, in part, suicidal thoughts among an at-risk population of adolescent inpatients, and thus inform prevention efforts to address future risk of suicidal behavior.

However, to address specific psychological and ecological factors that may explain suicidal ideation among adolescents, it is important to first define adolescence as

a distinct period of development, and discuss ways in which adolescence may represent distinct challenges and opportunities with regard to risk of suicidal thoughts, behavior, and durable patterns of suicidality across the lifespan (e.g., Briere, Rohde, Seeley, Klein, & Lewinsohn, 2015; Pompili, Innmorati, Girardi, Tatarelli, & Lester, 2011).

Adolescence Defined: Perspectives from Developmental Psychopathology

Adolescence is a distinct phase of development comprised of several intersecting changes in biological, social, psychological, and environmental functioning (Cichetti & Rogosch, 2002; Masten & Cichetti, 2010; Viner et al., 2012; Sawyer et al., 2012). This period is integral to the maturation of effective psychological, interpersonal, and even vocational faculties via typical developmental processes of role exploration and pursuit of novel situations (Schulenberg, Sameroff, & Cicchetti, 2004). Indeed, most adolescents attain reasonably effective affective and interpersonal skills, and successfully enter adult living (Masten & Cichetti, 2010; Masten, 2001). However, a subset of adolescents encounters significant psychosocial/environmental stressors (e.g., community violence, familial discord), traumatic events, experience severe psychological distress, or confront childhood onset of severe and persistent mental illness (Reef, Diamantopoulou, van Meurs, Verhulst, & van der Ende, 2009). For this subset of youth, it is important to consider how the intersection of adolescent development, psychopathology, and adversity may be experienced in a particular way and how these experiences may confer risk of long-term dysfunction and maladjustment. One paradigm that has advanced the understanding of psychopathology and maladjustment among children and adolescents has been that of developmental psychopathology (Masten & Cichetti, 2010; Cichetti & Rogosch, 2002; Sameroff, 2001).

As a paradigm, developmental psychopathology asserts the importance of considering interactive and transactional dynamics of both risk and protective factors, in concert with the overlapping and intersecting influence of psychological, social, environmental, and ecological domains of risk. Cichetti & Rogosch (2002) described this comprehensive approach to conceptualizing adolescent maladjustment this way:

> The developmental psychopathologist is concerned not simply with differences in symptom presentation at different developmental periods but rather with the degree of convergence or divergence in the organization of biological, psychological, and social-contextual systems as they relate to symptom manifestation and disorder. (p. 7)

This characterization of developmental psychopathology acknowledges the need for psychological research among adolescents to advance beyond discrete approaches to specific categories of mental illness, and instead offer continuous consideration of dynamic phenomena across levels of experience, including continuous measurement of symptomatology and contextual variables. This type of integrative approach to developmental psychopathology has been framed within the specific concept of development cascades (Masten & Cichetti, 2010). Developmental cascades represent indirect and conditional effects within and across developmental periods and within and across ecological layers that may explain the tertiary consequences of events that occur in childhood and adolescence, including the consequences of psychological symptoms. For example, one might experience the cumulative conditional effect of female gender via increased risk of sexual victimization, that in turn interacts with the presence or absence of protective factors (i.e., resiliency), and is manifest within the context of sufficient or

insufficient resources and support within one's community (e.g., metropolitan v. rural availability of healthcare providers). Of relevance to the proposed dissertation study, developmental cascades offer a theoretical foundation for inclusion of mediating (i.e., resiliency) and moderating (i.e., gender & rurality-urbanicity) effects that may explain the association between distress or adversity and maladaptive outcomes for an at-risk population. As noted by Sameroff (2001), analysis of adolescent mental health and mental illness should include explicit consideration of context, and simultaneous analysis of risk and protective factors. The proposed study will seek to appropriate this type of approach by examining risk and protective factors simultaneously within the context of gender and rurality-urbanicity in an inpatient sample of adolescents in a largely rural state.

Although extant approaches concerning the identification of risk and protective factors have done much to advance the understanding of adolescent suicide and suicidal ideation, effective integration of recommendations derived from perspectives in developmental psychopathology within the study of adolescent suicidal ideation may advance the literature concerning how risk and resilience factors operate in tandem against the backdrop of individual and environmental context. The proposed study will advance such an agenda through simultaneous inclusion of risk and protective factors within a comprehensive structural model. As noted in the aforementioned studies, adolescent suicidal ideation is strongly associated with symptoms of psychopathology, including trauma-related distress and symptoms of depression. This is especially true for adolescent psychiatric inpatients, who suffer higher levels of such symptoms relative to non-clinical peers, and who may experience specific patterns of risk given the severity of

their symptom presentations. In this way one should consider the extent to which adolescent inpatients represent an at-risk population that would likely benefit from additional study concerning risk and protective factors for suicidal ideation within the context of psychopathology.

Adolescent inpatients: An at-risk population

It is reasonable to assert the need to examine specific domains of risk among adolescents who have experience marked deviations from typical adjustment during this stage of development. In particular, adolescents who have been admitted to an inpatient psychiatric hospital due to completed or threatened harm against self and/or others may offer a unique opportunity for understanding patterns of psychological and emotional functioning that contribute to longstanding maladjustment and suicidality (Yen et al., 2013). That is, adolescent psychiatric inpatients represent an at-risk population by the nature of their severe symptom presentations, which may be protracted over time via the aforementioned mechanisms of developmental cascades.

In addition to the author's assertion that adolescent psychiatric inpatients are patently at-risk given the nature of psychiatric hospitalization, myriad scholarship exists to identify specific domains of risk that are especially salient among adolescent psychiatric inpatients. Indeed, Steer and colleagues (1999) estimated current suicidal ideation among a sample of 108 adolescent inpatients aged 12 to 18 utilizing the Beck Scale for Suicide Ideation (Beck & Steer, 1991). They found that approximately 40% of youth assessed met criteria for current suicidal ideation (Steer, Kumar, & Beck, 1999). Similarly, Yen and colleagues (2013) analyzed data collected among 119 adolescent inpatients who were hospitalized due to contemporary suicide risk. Similar to Steer and

colleagues (1999), they found that participants' average responses (M=92.2, SD=44.2) on the Suicidal Ideation Questionnaire (Reynolds, 1987) fell beyond the clinical cutoff of 20 (Pinto, Wishman, & McCoy, 1997) and suggested clinically significant levels of suicidal ideation for the sample overall. In addition, they found that 37% of participants endorsed past histories (i.e., lifetime) of suicide attempt, approximately 23% of participants met criteria for PTSD, and nearly 80% met criteria for Major Depressive Episode. At 6-month follow-up, PTSD diagnosis was the only mood or anxiety disorder that significantly predicted future suicidal attempts among the 104 adolescents who completed a follow-up assessment (Yen et al., 2013). Collectively, these findings highlight the high rates of contemporary suicidal thoughts and both recent and historical suicidal behaviors among adolescent inpatients, which serve to indicate the high risk nature of this populations. Further, the findings of Yen and colleagues suggest that trauma-related distress (i.e., PTSD diagnosis) may be an especially salient predictor of future suicidal episodes relative to other mental disorders, with the exception of Personality Disorders, which have been found to predict suicidality above and beyond other known risk factors (Yen et al., 2013). Personality Disorders will not be considered within the proposed study of adolescent inpatients given that Personality Disorders are not manifest in a diagnosable form until adulthood (American Psychiatric Association, 2013).

Associations among trauma exposure, trauma-related distress, & suicidality

Several studies have identified high rates of trauma exposure, trauma-related distress, and suicidality among adolescents. For example, a recent study that included a nationally representative sample of American adolescents found that two-thirds of adolescents had experienced at least one "potential-traumatic-event" (i.e., index trauma),

which included experiences of interpersonal violence, serious accidents, and/or witnessing another's traumatic experience (McLaughlin et al., 2013). This high rate of exposure to traumatic events was supported by a recent review, which estimated that four out of five adolescents are exposed to at least one index trauma (i.e., DSM-IV criteria), and thus there is significant potential for trauma-related distress within adolescents as a population (Nooner et al., 2012). Consistent with the high rates of victimization identified in these large studies of adolescents who were not hospitalized (e.g., Waldrop et al., 2007; Miranda et al., 2014), adolescent inpatients also experience high rates of physical and sexual victimization, and associated trauma-related distress (Havens, Grudino, Biggs, Diamond, Weis, & Cloitre, 2012; McLaughlin et al., 2013). Moreover, adolescent inpatients suffer high rates of psychopathology, including depression, as nearly all report lifetime and/or recent suicidal ideation prior to admission, and most report recent and lifetime histories of attempted and/or threatened suicide prior to and following admission (Pfeiffer & Strzelecki, 1990; Goldston, Daniel, Reboussin, Kelley, & Frazier, 1998). These experiences of distress and suicidality appear to arise, in part, from a diverse array of adverse and traumatic experiences. Indeed, several studies have found an association between psychological distress and high rates of victimization among adolescents admitted to inpatient settings, including high rates of sexual victimization, physical abuse, and neglect (Sullivan, Fehon, Andres-Hyman, Lipschitz, & Grilo, 2006). Given this convergence of multiple domains of risk (i.e., trauma exposure, trauma-related distress, and psychopathology) within this particular sub-population of adolescents, it is necessary to consider the broader evidence concerning the durability of the associations

between trauma exposure, trauma-related distress, psychopathology, and suicidal ideation.

Several studies have identified trauma exposure, trauma-related distress, and symptoms of psychopathology as predictors of suicidal thoughts and behaviors among a variety of populations (e.g., Stein et al., 2010; Tarrier, 2004; Kanwar et al., 2013), including adolescents (Hodges et al., 2013; Zetterqvist et al., 2013; Mazza & Reynolds, 1999) and adolescent inpatients (Sullivan et al., 2006). Knox (2008) summarized the broad empirical evidence base concerning the association between traumatic experiences, trauma-related distress (i.e., PTSD), and suicidality. Knox asserted that approximately 80% of suicide risk across the lifespan in the general population could ultimately be attributable to the experience of childhood trauma, broadly defined. Further, this summary of previous studies emphasized the importance considering the "reverberating" (p.1) effects of trauma, including childhood trauma and trauma-related distress (Knox, 2008); which was consistent with the work of Masten and Cichetti (2010) concerning the potential impact of adolescent and childhood trauma via tertiary effects (i.e., developmental cascades) across the lifespan. That is, there are implications of trauma exposure in the form of trauma-related distress and other forms of psychopathology that may manifest long-term consequences with regard to one's overall ability to function with specific contexts. As noted by Pynoos (1999):

> Repeated or sequential traumatic experiences should be analyzed in regard to emerging developmental contexts. These contexts generate new sources of traumatic distress, situation-specific reminders, secondary stresses, and new efforts at adjustment, which carry additional implications at each occurrence for

acquisition of developmental competencies and prolongation or new onset of

psychopathology. (p.1542)

This suggestion that traumatic experiences may occasion both opportunities for risk and resilience is consistent with previous studies that have identified trauma-related distress as a predictor of negative outcomes above and beyond the impact of traumatic experiences themselves. The concept of developmental cascades may explain this, to an extent, as it may be that cumulative and interactive effects of trauma-related distress "reverberate" in a sequential and progressive manner that is problematic, and perhaps especially so for adolescent populations, as adolescence represents an "emerging developmental context." Several studies demonstrate that trauma-related distress and psychopathology generally represent more potent and durable influences upon long-term functioning relative to trauma exposure itself. This association between trauma-related distress and suicidality appears to be robust across populations and developmental stages. Therefore, consideration of specific constellations of risk and protective factors for at-risk adolescents may inform prevention and intervention efforts with significant tertiary consequences.

There is clear evidence from several large studies that establishes an association between trauma exposure and attempted or completed suicide, such that greater frequency of trauma exposures predicts greater odds of lifetime suicide attempt and completed suicide (e.g., Stein et al., 2010). This finding has also been demonstrated in a nationally representative sample of adolescents, whereby exposure to sexual assault, partner violence, school-based violence, and witnessing violence predicted greater lifetime odds of suicidal ideation, suicide plan, and having made a suicide attempt

(Epstein & Spirito, 2009). Nonetheless, considerable scholarship has suggested the predictive utility of trauma-related distress above and beyond exposure to trauma, and thus it may be particularly important to consider trauma-related distress as a predictor of risk among those who have experienced trauma. For example, in a study of 4,023 adolescents, Waldrop and colleagues (2007) found that 8.2% of adolescents had experienced sexual assault, 22.5% had experienced physical assault, and 39.7% had witnessed violence. Furthermore, 8.1% of adolescents had experienced lifetime history of posttraumatic stress disorder (PTSD), and 15.2% had experienced clinically significant symptoms of depression. Results of sequential logistic regression analyses demonstrated that lifetime history of PTSD (OR = 2.22, p < .001) was a significant predictor of lifetime suicidal ideation above and beyond effects of lifetime history of depression (OR = 4.94, p < .001), gender (OR = 1.48, p < .001), age (OR = 1.06), sexual assault (OR = 1.69, p<.01), physical assault (OR = 1.89, p < .001), and witnessing violence (OR = 1.28, p < .05). Similarly, PTSD (OR = 1.92, p < .01) predicted lifetime history of suicide attempt above and beyond history of depression (OR = 8.38, p <.001), and experiences of violence (Waldrop et al., 2007). Thus, PTSD and depression symptoms emerged as distinctly important predictors of suicidality after controlling for other known risk factors, and suggested the importance of considering trauma-related distress above and beyond trauma exposure and other symptoms of psychopathology within the study of suicidal ideation and suicide risk within adolescent populations.

Similarly, Wilcox and colleagues (2009) reported the results of a follow-up study of primarily (i.e., 71%) African-American urban young adults, which was drawn from an original cohort of 2,311 children, to assess the relative risk of lifetime suicidal behaviors

across levels of trauma exposure and PTSD. Consistent with other studies, it was found that participants who had experienced one or more index traumas and developed clinically significant PTSD were at increased risk of having ever attempted suicide relative to participants who had experienced trauma but had not developed subsequent PTSD. This finding also suggests the distinctive role of trauma-related distress following victimization, and suggests that such distress may, in part, explain the association between trauma exposure and suicidality (Wilcox, Storr, & Breslau, 2009).

Given that trauma-related distress may differentiate between trauma survivors who experience suicidal thoughts and behaviors, and those who do not (e.g., Wilcox et al., 2009), it is necessary to consider which forms of distress and psychopathology are meaningful predictors of suicidality relative to others. For example, a study by Sareen and colleagues (2005) analyzed data from the National Comorbidity survey (N=5,877), a nationally representative sample of Americans aged 15 to 54 years, and sought to examine the association between lifetime diagnosis of psychiatric illness and lifetime history of suicide attempt or suicidal ideation. Psychiatric illness included PTSD, Major Depressive Disorder, other psychiatric conditions, and comorbid psychopathology. After controlling for several potential confounds, including socio-demographic (i.e., age, sex, ethnicity, educational level, marital status) and other psychiatric diagnoses (e.g., substance use disorders, anxiety disorders), they found that lifetime diagnosis of PTSD significantly predicted greater odds of lifetime suicidal ideation (OR=2.79) and suicide attempt (OR=2.67) above and beyond symptoms of depression. Similarly, lifetime history of Major Depressive Disorder predicted greater odds of suicidal ideation (OR=4.53) and suicide attempt (OR=3.34) relative to disorders other than PTSD. Notably, these

researchers did not find an independent effect of non-PTSD anxiety disorders, however they did find that comorbid diagnoses significantly predicted suicide attempt (OR=2.25) but not suicidal ideation. Thus, PTSD and Major Depressive Disorder appeared to be uniquely salient predictors of suicidal ideation and suicide attempt (Sareen, Houlahan, Cox, & Asmundson, 2005), and likely represent important risk factors within the broader constellation of variables that contribute to suicidality.

Similarly, Marshall and colleagues (2001) evaluated the association between PTSD symptoms and suicidality among a sample of 2,608 trauma survivors aged 18 to 94 years, who endorsed at least one symptom of PTSD of 1 month's duration since the index trauma occurred. They found that there was a significant increase in the odds of suicidal ideation across levels of sub-threshold PTSD symptoms. Specifically, they found that sub-threshold PTSD symptoms (OR=1.73) predicted greater odds of suicidal ideation above and beyond socio-demographic variables and symptoms of depression (OR=3.91). The authors also noted the similarity in the level of risk conferred by sub-threshold PTSD symptoms (OR=1.73) relative to meeting full diagnostic criteria for PTSD (OR=2.09), which suggested the importance of considering the degree to which one experiences trauma-related distress rather than solely focusing on categorical approaches to diagnostic status within the context of suicidality among trauma survivors (Marshall et al., 2001). That is, had these researchers not considered the degree to which participants experienced trauma-related distress (i.e., PTSD symptoms), their results would have obfuscated the continuous nature of the association between trauma-related distress and suicidality.

In regard to adolescent populations, there also appear to be consistent associations between trauma-related distress and suicidal ideation. For example, a meta-analysis of 28

published studies by Panagioti and colleagues (2015) found a strong positive association

between trauma-related distress (i.e., primarily presence/absence of PTSD diagnosis) and

suicidality. Specifically, PTSD symptoms predicted suicide attempt (d = .697) and

suicidal ideation (d = .714) above and beyond socio-demographic variables (i.e., age and

gender), study methodology, and sample type (i.e., community v. clinical samples;

Panagioti, Gooding, Triantafyllou, & Tarrier, 2015).

   Notwithstanding the previously cited works, which establish an association

between trauma-related distress (i.e., PTSD diagnosis or symptoms of PTSD) and

suicidality across multiple contexts, it should be noted that most people who contemplate

and/or attempt suicide do not complete suicide despite the marked increase in suicide risk

following these parasuicidal behaviors. Thus, the work of Gradus and colleagues (2010)

offered an important extension of existing findings by evaluating the association between

trauma related-distress (i.e., PTSD diagnosis) and completed suicide, above and beyond

socio-demographic variables and other psychiatric diagnoses (i.e., Major Depressive

Disorder). They found that PTSD independently predicted greater odds (OR=5.3) of

completed suicide above and beyond potential confounds, including Major Depression,

which also emerged as an independent predictor (OR=13.00) of completed suicide. In

addition, the comorbidity of PTSD and Depression demonstrated the greatest increase in

risk of completed suicide (OR=29.00; Gradus, et al., 2010), and suggested the

imperativeness of considering both PTSD and Depression within models of completed

and attempted suicidal behavior.

   In addition to the association between comorbid PTSD and Depression and

completed suicide, previous studies have also found greater risk of attempted suicide and

suicidal ideation that is attributable to comorbid PTSD and Depression. Specifically, a

meta-analysis of 63 studies that evaluated the association between PTSD, Depression,

and suicidality (i.e., suicidal ideation and suicide attempt) found that PTSD was a

significant predictor of suicidality across the studies included (Panagioti, Gooding, &

Tarrier, 2012). Furthermore, this meta-analysis found that the association between PTSD

and suicidality was conditional upon the level of depressive symptoms reported by study

participants, such that the association between PTSD and suicidality was stronger at

higher levels of depressive symptoms. Although there was considerable variability

among the studies concerning the definition of suicidality (e.g., suicidal ideation, suicide

attempt, suicidal ideation and suicide attempt), the pooled effects are consistent with the

literature reviewed herein, and also correspond with other meta-analyses concerning the

association between trauma-related distress, depression, and suicidality (e.g., Kanwar et

al., 2013). Taken together, these findings demonstrate how trauma related-distress and

psychopathology predict thoughts of suicide, suicidal behaviors, and death by suicide

above and beyond trauma exposure alone, and above and beyond potential confounding

variables (e.g., socio-demographic variables).

With the exception of Marshall and colleagues (2001), the above cited studies

operationalized trauma-related distress within the context of diagnostic categories (i.e.,

dichotomous presence/absence variables). This dichotomization of psychopathology may

limit both the statistical power of analyses conducted, as well as the ecological validity of

the findings offered. That is, trauma-related distress is likely experienced dimensionally

as a matter of degree and extent rather than as a discrete phenomenon. As noted by Ford

and Courtois (2009), "…existing diagnoses, including PTSD, cannot fully account for, or

guide the treatment of the sequellae of complex trauma" (p.19). This assertion that

trauma-related distress may be more complex than traumatic stress (i.e., PTSD

symptomatology) alone is especially pertinent to the study of trauma-related distress in

adolescent inpatient populations, who are more likely to have experienced traumatization

within the context of a caregiver relationships over prolonged periods relative to other

populations, and who commonly present with a range of symptomatology that spans

multiple diagnostic categories (e.g., Havens et al., 2012). As described by previous

studies, conventional diagnostic nosologies (i.e., DSM criteria) of trauma-related

psychopathology may not readily capture the continuous phenomenology of dissociative,

somatic, cognitive, and affective symptoms that are likely to occur in concert for

survivors of repeated trauma, including that which occurs in childhood (Hermann, 1992;

Courtois, 2004). This suggests the necessity of measuring distress across these domains

within the study of trauma-related distress and suicidality among adolescent inpatients.

In addition to the potential for underestimating distress that may occur when

estimating symptoms within discrete categories, it may be particularly important to assess

complex and overlapping symptoms of PTSD among adolescents, who are more likely to

suffer trauma-related distress across multiple domains of psychopathology (e.g., PTSD

and depression; Ford & Cloitre, 2009). Consistent with the aforementioned work in the

field of developmental psychopathology (e.g., Masten & Cicchetti, 2001), other

researchers (e.g., Ford, 2009; Ford & Cloitre, 2009) have noted the particular

vulnerability that may accompany complex symptoms of trauma-related distress when

they occur in childhood and adolescence, including the potential for compromised

interpersonal functioning and emotion regulation via the consequences of trauma-related

distress. Therefore, there may be utility in conceptualizing trauma-related distress more broadly than traumatic stress (i.e., PTSD symptoms) alone. Within the proposed study, trauma-related distress will be considered across several domains of symptomatology, including symptoms of posttraumatic stress, depression, anger, dissociation, and sexual concerns.

Few studies have evaluated the association between trauma-related distress and suicidality using continuous measurements of distress that span multiple domains of symptomatology as described above. One study that has considered this association using a continuous measurement of distress is a recent investigation by Zetterqvist and colleagues (2013). They found that Swedish adolescents with more severe histories of suicidal behaviors and self-harm reported significantly higher levels of trauma-related distress relative to adolescents who reported not having engaged in suicidal or self-harming behaviors. This included higher scores on all subclass of the Trauma Symptoms Checklist for Children (TSCC), including Depression, Anger, Anxiety, Posttraumatic stress, and Dissociation subscales. Moreover, the largest differences were found with regard to the Posttraumatic Stress and Depression subscales (Zetterqvist, Lundh, & Svedin, 2013), which corresponds with other studies that have demonstrated the particular salience of PTSD and Depression symptoms relative to suicidal ideation and attempted suicide. Andover and colleagues (2012) noted similar effects across the studies included in their recent review. In particular, they noted trauma and depressive symptoms, along with suicidal ideation, as identified correlates of suicide attempt (Andover, Morris, Wren, & Bruzzese, 2012), which further supports the importance of

considering the association between these symptoms and suicidal ideation as a research aim within the study and prevention of completed suicide.

Despite previous scholarship concerning the high prevalence of PTSD, comorbid mood disorders, and high rates of suicidal ideation and attempts among adolescent inpatients following discharge from inpatient care, there is a dearth of studies concerning the association between trauma-related distress and suicidal ideation that specifically included adolescent inpatients. Only two identified studies analyzed the main effect of trauma-related distress with regard to suicidal ideation among adolescent inpatients (i.e., Lipschitz et al., 1999; Havens et al., 2012). In their investigation of 74 adolescents admitted to an inpatient unit (52.3% female, aged 11 to 18 years), Lipschitz and colleagues (1999) found that 93% of participants endorsed at least one traumatic event (i.e., index trauma), and that approximately one-third (32.8%) met DSM-III-R criteria for PTSD. Similar to previous studies of adults in the general population, this study of adolescent inpatients found that approximately 67% of participants who met criteria for PTSD also had a comorbid diagnosis of a mood disorder. Furthermore, this study found large significant differences on measures of suicidal ideation (i.e., $d = 0.96$, Suicidal Ideation Questionnaire-Revised scores) and estimated lifetime number of suicide attempts (i.e., $d = 0.78$, specific item from Traumatic Events Questionnaire-Adolescent version) between adolescents diagnosed with PTSD, and those who did not meet criteria for PTSD, such that those who met criteria for PTSD had higher rates of suicidal ideation and suicide attempt (Lipschitz et al., 1999). To be certain, the work of Lipschitz and colleagues (1999) has a number of strengths, and represents a study of particular importance given the limited number of subsequent studies that explicitly address the

association between trauma-related distress and suicidal ideation. However, the limitations of group comparisons employed in this early study, including the limitations of categorical variables representing trauma-related distress (i.e., PTSD diagnosis v. No PTSD diagnosis), and the failure to account for inflated Type I error arising from multiple comparisons, tempers the extent to which firm conclusions can be drawn from the findings. It also underscores the importance of the proposed study, which will extend this important early work via integration of continuous variables within a more comprehensive framework of risk and protective factors.

Another study, by Havens and colleagues (2012), also found that nearly all (i.e., 96%) adolescents in a sample of 140 inpatients aged 12 to 18 had been exposed to at least one "potentially traumatic event." Similar to previous findings, these researchers discovered that nearly 30% of adolescents surveyed were likely to have met diagnostic criteria for PTSD. These researchers asserted likelihood of a PTSD diagnosis based upon response to a symptom inventory, rather than presence/absence of PTSD based upon a structured diagnostic instrument. Further, there was a high rate of comorbidity between PTSD symptoms and Major Depression, such that PTSD symptoms were associated with greater likelihood of having been diagnosed with Depression upon intake. Probable diagnosis of PTSD also differentiated between youth with regard to suicidal ideation, such that youth with significant PTSD symptoms were overrepresented within the group of participants who reported suicidal ideation relative to peers who did not report clinically significant PTSD symptoms (i.e., probable PTSD; Havens et al., 2012).

Another recent investigation, by Bodzy and colleagues (2015), compared sub-samples of child inpatients (aged 7 to 12 years) who had reported ($n = 70$) and who had

not reported (*n* = 59) current suicidal ideation. Consistent with other studies that have

demonstrated an association between trauma-related distress and suicidality among

adolescents (i.e., Lipschitz et al., 1999; Havens et al., 2012), children with current

suicidal ideation also reported higher levels of trauma-related distress on the Trauma

Symptoms Checklist for Children, including greater endorsement of symptoms on the

Depression and Posttraumatic Stress subscales (Bodzy, Barreto, Swenson, Liguori, &

Costea, 2015). This finding, even though not demonstrated in an adolescent sample per

se, lends support for the conclusion that there is an association between trauma-related

distress and suicidal ideation among youth admitted to inpatient settings, and further

supports the importance of considering the ways in which this association may be

addressed via conditional and intervening variables that might explain the mechanisms

underpinning this association. Specifically, these nascent findings from inpatient settings

demonstrate a clear association between trauma-related distress and suicidal ideation and

suggest the importance of further examining these links by exploring intervening (i.e.,

resiliency), contextual (i.e., rurality-urbanicity), and conditional (i.e., gender) effects,

which may in turn permit a clearer understanding of how, and under what conditions,

trauma-related distress predicts suicidal ideation.

Although there is strong evidence to suggest that trauma-related distress is

uniquely predictive of suicidality, including suicidal ideation, it is should be noted that

there is some conflict within the literature concerning the association between trauma-

related distress (i.e., PTSD) and suicidality. Specifically, in a study of 668 American

participants who ranged in age from 18 to 45 years, Yen and colleagues (2003) found that

PTSD was not a significant independent predictor of suicide attempt when Borderline

Personality Disorder was included within the same statistical model. These researchers suggested that Borderline Personality Disorder may better explain increased rates of suicidality resulting from trauma, and that the association between PTSD and suicidality may be confounded by the influence of Borderline Personality Disorder (Yen et al., 2003). Although Personality Disorders are not diagnosable within children and adolescents, the findings of Yen and colleagues highlight the importance of considering specific processes within the context of adolescence. That is, the findings of Yen and colleagues (2003) may eschew the importance of developmental cascades by offering the descriptive category of Borderline Personality Disorder as an explanation for the complex patterns of behavior that are likely to have unfolded over time. Perhaps the observed explanatory utility of the diagnosis of Borderline Personality Disorder within the work of Yen and colleagues (2003) is in fact better explained by the framework posited above, whereby early experiences of adversity (e.g., invalidating early environment; see Linehan, 1993) result in trauma-related distress, which may yield recursive and compounding experiences of risk via suicidal ideation and subsequent suicidal behaviors over time. In this way, the identified influence of Borderline Personality Disorder may represent responses to trauma-related distress within particular contexts, rather than a qualitatively distinct characterological cause.

Other studies have also reported null findings concerning the association between trauma-related distress and suicide attempt among specific sub-populations (e.g., military veterans; Griffith, 2012). Therefore, it is important that research address ecological and contextual variables that may modify the relationship between trauma-related distress and suicidality, and in doing so, further elucidate the extent to which trauma-related distress

represents nomothetic or idiographic patterns of risk for suicidal ideation within particular populations and sub-populations. A recent meta-analysis by Kanwar and colleagues (2013) supported the broader finding that trauma-related distress predicted suicide attempt and suicidal ideation across 10 and 6 studies, respectively. However, this meta-analysis explicitly addressed heterogeneity across analyzed studies via the I^2 statistic (Higgins & Thompson, 2002), which estimates the extent to which variability among studies is due to sampling error or other sources of error (Huedo-Medina, Sánchez-Meca, Marín-Martínez, & Botella, 2006). Notably, the I^2 estimates for pooled effects within this meta-analysis were in many cases greater than 0.50, which suggested that more than half of the variability in the error observed between studies was attributable to true differences between studies rather than sampling error alone, and thus suggested that there may be systematic variation across studies that was not captured within the assessed association between trauma-related distress and suicidality. This heterogeneity across studies further supports the need for research that accounts for conditional and indirect effects within distinct populations concerning the association between trauma-related distress and suicidality. For example, there may be intervening variables that have not been well-represented within previous studies that would explicate the indirect effect of trauma-related distress via particular mechanisms. One such mechanism would be the extent to which one experiences meaningful connection with social support, competence in developmentally-relevant domains of functioning, and sufficient ability to manage intense emotions. The proposed study will include these three processes within the latent construct of resiliency as an intervening variable that may explain, in part, the total effect of trauma-related distress upon suicidal ideation.

Resiliency, trauma-related distress, and suicidal ideation

Resiliency factors, including sense of connectedness and sense of competence (i.e., mastery) have been found to protect against the negative consequences of problematic substance use, violence exposure, and problematic sexual behaviors (Fergus & Zimmerman, 2005). This is well reflected across several empirical studies that measured resilience relative to negative outcomes among adolescents. The nature of resiliency as a variable of importance, and the potential of resilience to inform translational research and subsequent intervention efforts is well captured by Masten (2001), who wrote:

> Resilience appears to be a common phenomenon that results in most cases from the operation of basic human adaptational systems. If those systems are protected and in good working order, development is robust even in the face of severe adversity; if these major systems are impaired, antecedent or consequent to adversity, then the risk for developmental problems is much greater, particularly if the environmental hazards are prolonged (p. 227)

This emphasis on resilience as fundamental processes that are malleable to therapeutic intervention within the context of ecological constraints was echoed by Zolkoski and Bullock (2012) in a recent review of adolescent resilience. Further, these researchers emphasized the importance of integrating multiple domains of resiliency rather than discrete elements of individual or familial functioning (Zolkoski & Bullock, 2012).

Considered within the context of trauma exposure and recovery, Wilson and Agaibi (2006) defined resiliency as "a complex repertoire of behavior tendencies" (p. 374). They explicated this broad characterization within a dynamic and interactive model

of posttraumatic resiliency that incorporated a nuanced assessment of complexity within

regard to 'what' represents trauma exposure (e.g., type of trauma, duration, severity, etc.),

as well as a joint consideration of both dispositional resiliency (e.g., self-efficacy) traits

alongside specific behavioral responses and skills (e.g., adaptability, comfort &

tolerance), that may promote and portend optimal coping and adjustment in the wake of

trauma (Wilson & Agaibi, 2006). Similarly, in a review of literature concerning survivors

of trauma, Agaibi and Wilson (2005) noted the challenges of assessing resiliency in a

meaningful and consistent manner, especially given the myriad definitions and measures

of resiliency offered within the psychology and trauma literatures.

In describing early definitions and studies of resilience, Agaibi and Wilson (2005)

discuss the longitudinal findings of Felsman and Valiant (1982), who analyzed resiliency

and psychopathology among Harvard students over 40 years. Consistent with

contemporary approaches in adolescent psychopathology, Felsman and Valiant (1982)

identified the importance of incremental development of resiliency over time via

exposure to typical experiences of adversity in childhood and adolescence. In contrast,

experiences of marked adversity (i.e., trauma) appeared to predict greater

psychopathology in adulthood, and were thought to have thwarted formative experiences

of mastery and efficacy within the context of childhood and adolescent development

(Felsman & Valiant, 1982; Agaibi & Wilson, 2005). In this way, scholars have asserted

the importance of considering resiliency within the context of development, and within

the context of conditional and indirect effects grounded in the complex individual (e.g.,

gender) and ecological (e.g., rurality-urbanicity) factors that accompany experiences of

adversity, development, and psychopathology (i.e., trauma-related distress) across

populations (Agaibi & Wilson, 2005; Wilson & Agaibi, 2006). This is not to say that abrupt and unexpected events will never occasion the opportunity for resilience to emerge, as many studies have highlighted the potential for adaptive growth and transformation in the wake of traumatic events (i.e., posttraumatic growth; Tedeschi & Calhoun, 1995). For example, Bensimon (2012) found that trait resilience (i.e., one's longstanding personal characteristics that buffer the effects of trauma exposure) was associated with greater post traumatic growth and lower symptoms of PTSD among a sample of 500 Israeli college students. However, some sub-populations may be particularly vulnerable to thwarted resiliency, and may therefore suffer disproportionate risk of maladjustment and psychopathology over time. One specific population that may experience distinct outcomes related to resiliency following trauma is adolescents, who experience several intersecting biological, psychosocial, and ecological influences within a relatively brief span of development.

In a review of the literature concerning resiliency in adolescent populations, Fergus and Zimmerman (2005) defined resiliency to include processes of mitigating consequence of exposure to risk factors, successfully responding to traumatic experiences, and "avoiding the negative trajectories associated with risks" (p.399). Implicit within this characterization of resiliency as the avoidance or diversion from negative trajectories is another key assumption guiding approaches to the study of resiliency, that of the need to understand typical development (Cicchetti, 1984). That is, understanding typical development permits a clear distinction between circumstances under which resiliency is a factor that mitigates future harm, and circumstances in which resiliency is, as Masten (2001) described it, "the operation of basic human adaptational

systems" (p.227). This distinction is important to consider within the study of adolescent inpatients, a population that has been found to experience marked departures from typical developmental trajectories via trauma exposure (e.g., Lipschitz et al., 1999; Havens et al., 2012). Thus, measured cognitive-behavioral repertoires related to sense of mastery, emotional reactivity, and sense of connectedness with others are likely to be representative of resiliency despite adversity for adolescent inpatients as a population.

Zimmerman (2005) also described resiliency as inclusive of environmental and social resources that extended original conceptualizations of resiliency, which were primarily focused on characterological traits. Indeed, contemporary researchers (i.e., Fergus & Zimmerman, 2005; Zimmerman, 2013) assert that solely trait-based appreciations of resiliency are limited with regard to intervention and prevention efforts as such approaches may confer blame or criticism toward individuals based upon dispositional traits without offering a clear mechanism for enhancing protective factors via enhancement of resiliency. In considering resiliency within an ecological context, and as both disposition and a repertoire of specific skillsets and responses, it becomes possible to consider resilience as a potential point of intervention. In particular, resilience may represent a process of "steeling or inoculation" (p. 404) if it occurs at a low to moderate level that does not overwhelm available resources and conditions (Fergus & Zimmerman, 2005; Zimmerman, 2013). This is similar to the work of Agaibi and Wilson (2005) concerning the potential for effective adjustment via gradual exposure to typical challenges and adversities that arise over time and are commensurate with the attained personal resources (i.e., coping skills and adaptability) of an individual at a given time.

Consistent with the above described broad framework of resiliency, Prince-Embury (2008) defined resiliency in children and adolescents to be comprised of three domains that include: sense of mastery (i.e., "sense of optimism, self-efficacy, and adaptability" p. 44); sense of relatedness (i.e., "trust, support, comfort and tolerance" p. 44); and emotional reactivity (i.e., "perceived sensitivity, recovery time, and impairment because of emotional arousal" p. 43). These domains correspond with previous research (e.g., Social cognitive theory of posttraumatic recovery; Benight & Bandura, 2004) concerning the distinct and overlapping influences of personal resources (i.e., sense of mastery) and environmental (i.e., sense of relatedness) protective factors, and extend previous research by offering a clear synthesis across specific facets of resources and protective factors within the context of emotional reactivity. Such an integration of personal resources and environmental supports has been advocated by other researchers, including Barron and colleagues (2015), who suggested that consideration of multiple domains of resiliency, including both risk and protective factors, might offer a more meaningful approach to assessment of functioning among child and adolescent populations.

This model is further supported by data collected among normative and clinical samples of youth during the development of the Resiliency Scales for Children and Adolescents (RCSA; Prince-Embury, 2006; 2007). In a comparison of non-clinical (N=100) and clinic-referred youth ($N = 169$), different domains of resiliency were correlated with psychopathology, such that resiliency was negatively correlated with symptoms of psychopathology. Specifically, sense of mastery was negatively correlated with symptoms of anxiety ($r = -.51$), depression ($r = -.59$), and anger ($r = -.61$) on the

Beck Youth Inventory – Second Edition (BYI-II; Beck, Beck, Jolly, & Steer, 2005; Prince-Embury, 2008). Sense of relatedness was also negatively correlated with symptoms of anxiety ($r = -.50$), depression ($r = -.56$), and anger ($r = -.57$) on the BYI-II. In contrast, emotional reactivity was positively correlated with symptoms of anxiety ($r = .65$), depression ($r = .74$), and anger ($r = .76$) on the BYI-II (Prince-Embury, 2008). These correlational findings highlight the potential utility of considering adolescent resiliency across domains of resources and vulnerability within a single model of resiliency (e.g., RCSA).

Furthermore, clinic-referred and non-clinic-referred youth evidenced differing levels of resiliency overall, such that non-clinical samples of youth reported higher levels of sense of mastery ($d = 1.11$) and sense of relatedness ($d = 1.12$), and lower levels of emotional reactivity ($d = 1.20$) on the RSCA relative to clinic-referred youth (Prince-Embury, 2008). These mean comparisons are consistent with previously cited studies concerning the potential for trauma exposure, trauma-related distress, and suicidality among adolescent inpatients, who may also experience lower levels of resiliency relative to age-mates who have not been hospitalized. This tripartite model of adolescent resiliency is supported by factor analytic studies that demonstrate these distinct aspects of resiliency as the best fit for data collected among diverse samples of children and adolescents (Prince-Ebury & Courville, 2008). However, few studies have evaluated the associations between trauma-related distress or suicidality and this particular operationalization of resiliency. Nonetheless, several studies have evaluated similar aspects of resiliency that are useful for asserting Prince-Embury's (2006; 2007; 2008) model of resiliency within the context of the proposed study.

For example, in a study of 255 Norwegian young adults (i.e., late adolescents; M=20 years), Nrugham and colleagues (2010) found that resiliency traits protected against suicide attempts relative to violence exposure, such that those with higher resiliency traits had lower risk of attempting suicide. In this study resiliency was measured utilizing the Connor-Davidson Resiliency Scale (CD-RISC; Connor & Davidson, 2003), which includes several subscales (e.g., personal competence, trust in one's instincts, sense of control, and spirituality) that are similar to the RCSA (Nrugham, Holem, & Sund, 2010). However, the CD-RISC does not include a subscale for emotional reactivity or other domains of vulnerability, and thus likely does not sample the dialectic of resources and reactivity espoused by Prince-Embury (2006; 2007; 2008) with regard to resiliency in adolescents. In addition to this study that utilized a relatively comprehensive measure of personal resources within the context of resiliency, several other studies have assessed specific aspects and/or facets of resiliency with regard to suicidal ideation and trauma-related distress.

One such study, conducted by Valois and colleagues (2015), considered one aspect (i.e., emotional self-efficacy) of mastery with regard to suicidal ideation in a sample of 3,836 high school students aged 12 to 17 in a Southern State. They found that high emotional self-efficacy (i.e., the ability to manage negative and positive emotions effectively) was protective against suicidal ideation and suicide attempt, and that low emotional self-efficacy put youth at increased risk of suicidal ideation and suicide attempt. Specifically, youth with low emotional self-efficacy were approximately twice as likely to seriously consider suicide relative to peers with high emotional self-efficacy (Valois, Zullig, & Hunter, 2015).

Similarly, a recent study by He and colleagues (2015) considered sense of connectedness, another specific aspect of resiliency with regard to risk of suicidal ideation. They surveyed a sample of 995 children aged 11 to 17 years, and who were involved in the child protection system, and evaluated the association between socio-demographic variables, symptoms of psychopathology, sense of connectedness with caregivers and peers, and suicidal ideation via a series of sequential regressions. They found that youth who reported a greater sense of connection with caregivers had significantly lower odds of endorsing suicidal ideation (OR=0.56), above and beyond the influence of symptoms of depression (OR=3.98) and posttraumatic stress (i.e., Posttraumatic Stress subscale of the TSCC; OR=2.63; He, Fulginiti, & Finno-Velasquez, 2015). In this way, a particular aspect of resiliency (i.e., sense of connectendess) appeared to protect against thoughts of suicide, even when considered within the context of other risk factors that confer risk of suicidal thoughts.

Similar to specific findings in other areas discussed above, there is limited empirical literature concerning the nature and influence of resiliency with regard to trauma exposure, trauma-related distress, and suicidality among adolescents in general, and adolescent inpatients in particular. One study, by Jardin and colleagues (2015), examined the association between trauma exposure and trauma-related distress (i.e., Trauma Symptoms Checklist for Children) as moderated by secure attachment in a sample of 229 adolescent inpatients aged 12 to 17 years. The researchers found that the level of secure attachment (i.e., sense of connectedness) that youth felt between themselves and their parents moderated the association between sexual trauma and trauma-related distress, such that youth with lower levels of reported attachment

experienced higher levels of trauma-related distress (Jardin, Venta, Newlin, Ibarra, & Sharp, 2015). This finding was consistent with other studies of trauma survivors, including both adolescents and adults, and further supports the inclusion of connectedness and relatedness variables within the assessment of adolescent resilience. Furthermore, in another sample of youth that included 24 previously suicidal Canadian adolescent females, Everall and colleagues (2006) qualitatively analyzed adolescents' perceptions of the ways in which they had overcome their own suicidality. They found that youth identified specific domains of resiliency that included social, cognitive, emotional, and action-oriented approaches to recovery. Of note, the processes identified via qualitative inquiry yielded a variety of skills, tools, and coping strategies that youth had employed to address their own thoughts of suicide, and thus emphasized the importance of considering resiliency broadly, including both coping skills and enduring traits (Everall, Altrows, & Paulson, 2006).

Gerson and Rappaport (2013) note that resiliency factors remain understudied among adolescents who have experienced trauma-related distress, and thus warrants additional investigation, including evaluation of resiliency factors as modifiable points of intervention for youth experiencing such symptoms. The proposed study will attempt to address this gap in the literature by measuring multiple domains of resiliency within a vulnerable inpatient population who are likely to report high rates of trauma-related distress and suicidal ideation. Specifically, the proposed study will include resiliency factors of sense of connectedness, sense of mastery, and emotional reactivity as indicators of overall resiliency, and will consider resiliency as a mediator of the association between trauma-related distress and suicidal ideation. In addition, the proposed study will attempt

to integrate ecological and contextual variables that may modify the effects of resiliency, and that may also account for disparate rates of suicidal ideation among specific sub-populations, consistent with the studies cited above.

Conditional Effects of Rurality & Gender

Rural communities offer a distinct quality of life that in many ways has advanced important discourses of resilience via sustainability and emphasis on self-reliance within the context of small kinship communities of interdependent members (Scott, 2013). Indeed, there are myriad examples of healthy and sustainable approaches to individual, family, and community lifestyles that have their genesis in rural ways of living (e.g., Goodwin & Taha, 2014). However, despite the potential benefits of rurality that may be attributable to cohesion within a particular community, there exist compelling health disparities for rural populations when compared to individuals from urban communities.

Chief among health disparities suffered by rural populations are disproportionate rates of suicidal ideation, suicide attempt, and completed suicide suffered by rural communities across the world (Fontanella et al., 2015; Taylor et al., 2005; Hirsch & Cukrowicz, 2014). Several possible mechanisms have been identified to explain these disparities, including limited access to resources (e.g., broadly defined to include financial resources, healthcare & social services, education, & professional opportunities; Beard, Tomaska, Earnest, Summerhayes, & Morgan, 2009; Hirsch & Cukrowicz, 2014), shifting economic influences (i.e., decline of agricultural and manufacturing sectors; Scott, 2013; Beard et al., 2009), the often precarious nature of available social support (i.e., small populations; Beard et al., 2009; Hirsch & Cukrowicz, 2014), and maladaptive

cultural prescriptions against seeking help or addressing sources of distress (i.e., trauma, psychopathology; Beard et al., 2009; Hirsch & Cukrowicz, 2014).

Previous research has demonstrated longstanding disparities between rural and urban adolescents concerning rates of completed, attempted, and threatened suicide (Forrest, 1988). Recent scholarship continues to identify myriad ways in which rural populations, including rural adolescents, suffer disproportionate stressors antecedent to suicidal thoughts and behavior. In a recent study of suicide deaths in the United States between 1999 and 2010, Fontanella and colleagues (2015) compared rates of death by suicide across rural-urban continuum codes (i.e., 1 = "counties in a metropolitan area of 1 million population or more"; 9 = "Completely rural or less than 2500 urban population, not adjacent to a metropolitan area"; United States Department of Agriculture [USDA], 2013), which comprise an ordinal rating scale developed by the USDA to classify counties from most urban to most rural. Notably, all analyses controlled for the influence of potential confounds, including educational level, income, unemployment, poverty status, and immigration status at the county level. It was discovered that for both male and female decedents, the rate of suicide (i.e., deaths per 100,000 population) increased systematically across levels of rurality, such that the most rural locations had the highest observed rates of completed suicides for decedents aged 10 to 24 years. Furthermore, this study observed a significant conditional effect of gender, such that the increase in suicide rates across the rurality continuum was greater for males relative to females. When compared to the most urban category from the rurality continuum, between 2008 and 2010, males living in the most rural counties suffered nearly twice (Index of Relative Risk = 1.93) as much risk of suicide mortality, and females from the most rural locations

suffered a significant but lower increased risk of suicide mortality (Index of Relative Risk = 1.19). The data reported for deaths occurring between 2008 and 2010 represent a significant linear decrease in suicide rates among urban but not rural males since 1996, and thus suggest that rates of suicide and risk of suicide mortality have remained durable among rural populations relative to more urban communities (Fontanella et al., 2015).

In contrast to the effects noted above, Taylor and colleagues (2005) analyzed rates of suicide death across rural and urban communities in Australia, and found no effect of rurality after controlling for socio-demographic and economic variables. Although other studies have noted consistently higher rates of death by suicide in rural areas (e.g. Fontanella et al., 2015), Taylor and colleagues offer important insight concerning the potential limitations that may emerge when employing categorical ratings of rurality and urbanicity, and suggest the importance of considering rurality via a continuous classification system that integrates multiple domains of risk commonly attributed to rurality. The present study seeks to address this limitation via implementation of such a system.

Although previous studies have demonstrated elevated risk of death by suicide and suicidal behaviors among rural Peoples, previous scholarship has also indicated equivalent rates of psychopathology across urban and rural contexts (e.g., McCall-Hosenfeld; Peen, & Beckman, 2010). For example, in a large nationally representative sample of American communities, McCall-Hosenfeld and colleagues compared rates of psychopathology and trauma exposure across levels of the USDA rurality continuum. They reported no statistically significant differences between rural and urban communities concerning the presence of mental illness and the odds of having suffered

trauma (McCall-Hosenfeld, Mukherjee, & Lehman, 2014). These null findings are important to consider within the context of the proposed study, and may reflect the domains of resilience that are conferred by rurality and the quality of life present in rural communities. However, it may also reflect methodological limitations that include binary coding of rurality, as well as the use of aggregate data across all ages and ethnic groups. Similarly, another analysis of data from the National Commodity Study found that those raised in rural communities were significantly less likely (OR=0.74) to meet lifetime criteria for any mental disorder, and also less likely to have experienced childhood sexual abuse (OR=0.63; Goodwin & Taha, 2014).

In addition, recent findings from McLaughlin and colleagues (2013) were consistent with those of McCall-Hosenfeld and colleagues (2014), concerning rural-urban differences among a nationally representative sample of adolescents. Specifically, they found that there were no statistically significant differences between urban and rural adolescents across several domains of trauma exposure, however there was significantly increased odds of victimization by a caregiver (OR=140) for urban youth compared to rural counterparts, and significantly decreased odds of trauma related to an automobile accident (OR=-.70) for urban youth compared to rural counterparts. Further, there were no significant differences between rural and urban youth with regard to meeting criteria for the diagnosis of PTSD (McLaughlin et al, 2013).

Notwithstanding the aggregate equivalence that exists between rural and urban populations across population level measures of trauma, PTSD, and other psychiatric diagnoses, it is still necessary to evaluate specific constellations of risk that may exist for those who do ultimately suffer trauma-related distress and suicidality across levels of

rurality and urbanicity. Given the disproportionate rates of suicide and suicidal ideation that exist among rural populations, it may be that rural populations experience greater symptoms of distress and negative outcomes (e.g., suicidal ideation) at similar levels of trauma exposure and psychopathology relative to urban peers. That is, youth referred for inpatient care are not representative of the general population, for whom there appear to be equivalent rates of trauma exposure and PTSD observed in large studies (e.g., McLaughlin et al., 2013). Instead, it may be that those rural adolescents who do suffer trauma, psychopathology, and subsequent psychiatric hospitalization are at increased risk of suicidal ideation responsive to trauma-related symptoms and resilience factors, even though rural adolescents may not suffer disproportionate rates of trauma-related distress and psychopathology compared to urban peers in general.

Whether or not degree of rurality or urbanicity confers risk of suicidality within the context of trauma-related distress and resiliency remains unanswered within the literature. The previously cited scholarship offers some insight concerning the potential challenges of rurality with regard to increased rates of completed suicide and suicidal behaviors. It should be noted that the studies cited within the present review relied upon categorical approaches to classifying communities as rural or urban, or within the conventional continuum of rural to urban developed by the USDA. This use of categorical methods for classifying urban-rural differences has long been understood to be problematic. As noted by the USDA Economic Research Service (1971):

> …narrow statistical definitions that remain largely constant over time can fail to capture the full significance of emerging situations. A neat compartmentalization of society into urban and rural, or even metro and nonmetro, categories can show

differences and trends and is the best tool available, but hides many complex

degrees and variations in rural and urban American. (p. xii)

Thus, this is a significant and longstanding limitation that may serve to either over-estimate the differences between categories, or otherwise under-estimate the differences that may exist within categories. Given this significant limitation, the proposed study will implement a continuous measure of rurality, and perhaps offer a more powerful approach to assessing the influence of rurality within an adolescent inpatient population.

Although rurality does offer an important domain of risk with regard to completed suicide and suicidal thoughts, Armstrong and Manion (2015) describe the importance of considering the intersection of rurality and gender, as the gender differences observed across other populations also manifest particular patterns of risk for rural populations. In a study of 813 Canadian adolescents, aged 13 to 19 years, it was found that the presence of supportive others offered differential patterns of protection across rural and urban male and female participants. Specifically, they found that rural males and females differed, such that there was a significant effect of the role supportive others relative to symptoms of depression for rural females but not for rural males. Thus, the researchers advanced the importance of future studies that also include both rurality and gender within comprehensive models of suicidal ideation and resiliency in adolescents (Armstrong & Manion, 2015).

As with rates of suicide among adults, adolescents evidence a "gender gap" (e.g., Möller-Leimkühler, 2003) with regard to suicide rates among males and females. Specifically, male adolescents (5.97 suicide deaths per 100,000 people) completed suicide at a higher rate than female adolescents (2.38 suicide deaths per 100,000)

between 2008 and 2013 (CDC, 2005). Indeed, completed suicide among males in the

United States remains a longstanding public health concern, particularly given the

durability of this health disparity over several decades (Conner & Goldston, 2007).

However, the identified gender gap is somewhat paradoxical, in that although males

complete suicide at higher rates across several contexts, females tend to report higher

rates of suicidal ideation, and attempted suicide. Given that the proposed study includes

youth who were referred to inpatient care, this gap may be less salient. Nonetheless,

previous research supports the inclusion of gender within the proposed study as a

conditional effect with regard to the association between trauma-related distress,

depression symptoms, resiliency, and suicidal ideation.

Present study & Hypotheses

Noticeably absent from previous scholarship is a large (i.e., N > 140) sample of

adolescent inpatients that includes measures of depression symptoms and trauma-related

distress within a single model, and explores the indirect effect of resilience with regard to

suicidal ideation. The present study sought to advance this conspicuous gap in the

literature by examining the association between trauma-related symptoms, symptoms of

depression, and suicidal ideation among a large sample (i.e., $N = 550$) of adolescent

inpatients in a rural Northwestern State. Thus this study offers a strong potential

contribution to the literature given that it included a relatively large sample of adolescent

inpatients compared to previous studies, and therefore may have enhanced statistical

power and veracity with regard to several of the limitations noted among the previous

studies described above. Further, the present study examined the mediating influence of

resiliency, and the conditional effects of rurality, gender, and suicide attempter status.

This study also integrated the explicit and continuous measurement of context (i.e., rurality-urbanicity) within an incremental contribution to extant scholarship concerning the association between trauma-related distress and suicidal ideation in an at-risk population. The present study tested the following hypotheses via a hypothesized structural model (see Figure 1):

1. There will be a significant indirect effect of trauma-related distress upon suicidal ideation via resilience, such that trauma-related distress will predict lower levels of resiliency, and resiliency will predict lower levels of suicidal ideation. Thus, the total effect of trauma-related distress upon suicidal ideation will be a positive (i.e., increased trauma-related distress will predict greater suicidal ideation overall).

2. There will be a significant rurality by resilience interaction with regard to suicidal ideation, such that adolescents with higher rurality will have higher suicidal ideation across levels of resilience relative to adolescents with lower rurality.

3. Group comparison will demonstrate different structural models for male and female adolescents, and adolescents with and without a past history of suicide attempt, such that the indirect effect of trauma-related distress upon suicidal ideation will be stronger among female adolescents relative to male adolescents, and stronger among those with one or more past suicide attempts compared to those with no history of attempted suicide.

Method

Participants

Participants (i.e., patient health records) included 550 adolescent psychiatric

inpatients aged 11 to 17 years ($M = 14.60$, $SD = 1.68$) who presented for their first

admission to an adolescent unit of a public psychiatric hospital in a Northwestern State

between January 2010 and December 2015. Adolescents who had been previously

admitted to the partnering psychiatric hospital were excluded from the present sample. It

should also be noted that youth in this sample had typically exhausted other options for

psychiatric care (e.g., private inpatient care) prior to referral to the partnering hospital.

Fifty-six percent of participants ($n = 311$) identified as female, 43% ($n = 237$) identified

as male, and less than one percent identified as transgendered. In regard to ethnicity, the

adolescents in this sample identified as European-American ($n = 443$, 80.5%), Latino/a ($n

= 36$, 6.5%), American Indian ($n = 32$, 5.8%), African-American ($n = 23$, 4.2%), and

other ethnicities (i.e., Asian-American, Pacific Islander, Other, or Multi-ethnic; $n = 16$,

2.9%).

Participants reported a wide range of religious identifications. A notable portion

of the sample denied any specific religious identification or spirituality ($n = 220$, 40%),

and approximately nine percent described themselves as atheist or agnostic ($n = 50$,

9.1%). Among those who did identify as religiously observant, the plurality identified as

Non-Denominational or Protestant Christians ($n = 147$, 26.7%), approximately 14%

identified as members of the Church of Jesus Christ of Latter Day Saints (i.e., LDS; $n =

75$, 13.6%), approximately six percent identified as Catholic ($n = 31$, 5.6%), and less than

five percent identified with other religious and spiritual traditions (e.g., Wiccan,

Buddhist, Muslim; $n = 23$, 4.2%). Participants reported educational attainment that ranged from grade 4 to grade 12 ($M = 8.76$, $SD = 1.84$), while approximately one percent ($n = 4$) of adolescents denied completion of any formal education. Data concerning parental education and income were not available due to variability within available patient records.

Procedure

This study utilized a chart review method that collected data from medical records of adolescents admitted for inpatient psychiatric care at a public psychiatric hospital. Given that the medical records reviewed were considered protected health information, a waiver of informed consent was obtained from the ISU Human Subjects Committee, the Northwestern State's Department of Health & Welfare, and the partnering psychiatric hospital's administration for the present study. This procedure was consistent with existing State and Federal guidelines (e.g., Health Insurance Portability and Accountability Act [HIPAA]), and included a written data use agreement that defined the scope and procedure for the present study. All researchers involved with data collection completed training in the appropriate access and coding of protected health information. All methods and materials were approved by the ISU Human Subjects Committee prior to data collection.

Predictor and outcome variables were collected from clinical assessment measures that were administered by hospital staff to all admitted adolescents as part of the standard intake battery. These assessments included the Trauma Symptoms Checklist for Children (TSCC), the Children's Depression Inventory (CDI), Resiliency Scales for Children and Adolescents (RSCA), and the Minnesota Multiphasic Personality Inventory

– Adolescent Version (MMPI-A). Youth were requested to complete these assessments during the first 2 days following admission to the inpatient unit while on initial precautions for self-harming behaviors and suicidal behaviors and elopement (i.e., typically 48 hours). All youth who successfully completed the standard intake battery assessments were given gift certificates to be used at the hospital canteen. Although measures were scored by hospital staff for inclusion in patient assessment and treatment planning, this study gathered all raw testing data to ensure fidelity of scoring for all measures. This also allowed for the evaluation of measurement models for the latent constructs inferred from each scale that were included in the hypothesized structural model (see Figure 1).

Data were collected from paper and pencil administrations of the TSCC, CDI, RSCA, and MMPI-A via review of original medical records for each adolescent patient admitted from January 2010 to December 2015. This time period was chosen due to the implementation and consistent administration of standard battery measures beginning in January 2010. Undergraduate research assistants were trained in the use of a structured codebook to enter information from health records. This training included completion of several cases of data entry under the direct supervision of the principal investigator to ensure that coding was done reliably and was consistent with the established codebook. In addition, research assistants made note of data entry questions and concerns that were then addressed by the author. The trained research assistants entered data manually into a computer database (i.e., Microsoft Excel), including participant responses to all assessment items on measures comprising the standard intake battery. Next, research assistants accessed electronic medical records to code psychosocial history, demographic

information, and psychiatric background information. All data entry was checked by the principal investigator by reviewing every fifth record to ensure acceptable accuracy of data entry for both paper and electronic records review. There were several cases ($n = 14$) of data that were not properly aligned within the database (e.g., skipped column in spreadsheet) that were checked and corrected by the principal investigator. In addition to manual review of every fifth record, descriptive statistics were calculated to ensure that study variables were consistent with the possible range of values for study measures.

Measures

      Trauma-Related Distress. The Trauma Symptoms Checklist for Children (TSCC) is a 54-item self-report measure that assesses the presence and severity of trauma-related distress among children and adolescents aged 8 to 17 years (Briere, 1996). Respondents are instructed to rate each item using a-4-point point Likert scale (e.g., 0 = "never", 1 = "sometimes," 2 = "lots of times," 3 = "almost all of the time"). The TSCC is comprised of two validity scales and six clinical scales. The clinical scales include Anxiety, Depression, Posttraumatic Stress, Sexual Concerns, Dissociation, and Anger. Previous research has established the TSCC as a valid and reliable instrument across several distinct populations of children and adolescents (Briere, 1996; Nilsson, Wadsby, & Svedin, 2008).

      Specifically, Briere (1996) reported strong estimates of reliability and validity within the validation sample for the TSCC, which included approximately 3000 American school children aged 8 to 16 years. This study found good internal consistency ($\alpha = .77$ to .89) for the clinical scales (Briere, 1996). Subsequent research has established the TSCC as valid and reliable among other populations of children and adolescents,

including adolescent trauma survivors. In a study of 97 sexually abused youth presenting

for outpatient treatment, Crouch and colleagues (1999) found estimates of internal

consistency for the TSCC clinical scales (α = .69 to .87) that were similar to those

observed by Briere (1996). Furthermore, Crouch and colleagues noted the convergent

validity of the TSCC relative to the Children's Impact of Traumatic Events Scale –

Revised (CITES-R; Wolfe & Gentile, 1991), including significant moderate (i.e., r = .45)

to large (i.e., r = .66) correlations between nearly all (i.e., the Anger subscale was not

correlated with CITES-R PTSD subscale) TSCC subscales and the PTSD symptoms scale

of the CITES-R (Crouch, Smith, Ezell, & Saunders, 1999).

Similarly, a study by Sadowski and Friedrich (2000) examined the psychometric

properties of the TSCC in a sample of 119 adolescent inpatients, including 32 adolescents

who reported past histories of sexual abuse. Consistent with the aforementioned studies,

the TSCC demonstrated good estimates of internal consistency (α = .71 to .91) for this

sample of adolescents. In addition, a principal axis factor analyses revealed a one-factor

solution that accounted for 36.8% of the total variance, which was reflected in the strong

correlations between TSCC subscales and the TSCC total score (r = .69 to .89) and

suggested the viability of a single factor representing trauma-related distress across the

specific domains represented by TSCC subscales. All TSCC items, except for three items

from the Sexual Concerns subscale, loaded onto the identified single factor solution for

trauma-related distress (Sadowski & Friedrich, 2000). Several other studies have found

estimates of validity and reliability that are commensurate with the specific studies

reviewed above, including studies conducted among Swedish adolescents, (Nilsson et al.,

2008), children aged 8 to 12 years with sexual behavior problems (Allen, Thorn, & Gully,

2015), sexually abused adolescents (Bal, De Bourdeaudhuij, Crombex, & Van Oost, 2004), Child Protective Services-referred youth (Faulkner, Goldstein, & Wekerle, 2014), and incarcerated female adolescents (Grande et al., 2012). It is important to note that recent work by Butcher and colleagues (2015) has suggested the viability of a unique two-factor solution for the TSCC subscales, among a large sample (N=2,268) of juvenile offenders, via confirmatory factor analysis. However, there were negligible difference in reported deviance statistics between the single factor and two factor solutions. Notably, there were some inconsistencies in the statistical methods reported (Butcher, Kretschmar, Singer, & Flannery, 2015). Therefore, it is difficult to assess the veracity of the model comparisons offered by Butcher and colleagues. Nonetheless, this recent factor analytic study underscores the importance of explicitly assessing the validity of a single factor for trauma-related distress on the TSCC, and suggests the potential importance of the present study to further elucidate the measurement model of trauma-related distress via confirmatory factor analysis within the context of structural equation modelling.

The strong estimates of reliability and validity for the TSCC are reflected by the widespread use of the TSCC across a variety of clinical contexts. A survey of trauma psychologists in clinical practice found that the TSCC was the most commonly used measure of trauma-related distress among children and adolescents (Elhai, Gray, Kashdan, & Franklin, 2005). Given the overlap between the TSCC depression subscale and the Children's Depression Inventory, as well as the overlap of depression subscale items for self-harm and the MMPI-A suicidal ideation component scale, the TSCC Depression subscale and items assessing suicidal ideation were excluded from the hypothesized structural model. Subscale scores were calculated by summing the raw

scores for participant responses within each subscale consistent with the manualized version of the TSCC (i.e., Briere, 1996).

Symptoms of Depression. The Children's Depression Inventory (CDI) is a 27-item self-report instrument for use with children aged 7 to 17 years (Kovacs, 1992; Kovacs, 1980). The CDI invites respondents to rate specific symptoms of depression utilizing a 3-point Liker scale (e.g., 0 = "I am sad once in a while"; 2 = "I am sad all the time"). The CDI is comprised of five subscales, including Negative Mood, Interpersonal Problems, Ineffectiveness, Anhedonia, and Negative Self-Esteem. The CDI demonstrated good to excellent internal consistency (α = .71 to .89; Kovacs, 1992) across a broad range of samples, including American and Canadian normative samples (Sitarenios & Stein, 2004), child and adolescent psychiatric inpatients (α = .86; Kovacs, 1985), and pediatric outpatients in a medical setting (α = 71; Kovacs, 1985; Sitarenios & Stein, 2004). The CDI has also been found to evidence test-retest validity, and convergent validity with other measures of childhood depressive symptoms (Sitarenios & Stein, 2004).

A recent study by Huang and Dong (2014) analyzed the psychometric characteristics of the CDI via a meta-analysis that included 35 independent samples (N = 18,099), and included English and Non-English versions of the CDI across many unique contexts. This study utilized principal components factor analysis to evaluate the 5-factor solution proposed by Kovacs (1992) for the CDI. Principal components analysis demonstrated support for a 5-factor solution for the English version of the CDI, consistent with the model proposed by Kovacs (1992). Although there was some evidence for a 6-factor solution, it was determined that the 5-factor solution was more parsimonious, as only two items loaded on the sixth factor identified (Huang & Dong,

2014). Given the correspondence between the suicidal ideation item on the CDI and the suicidal ideation component scale of the MMPI-A, the suicidal ideation item was excluded from the CDI for the present analyses. Other than the exclusion of the suicidal ideation item from the Low Self-Esteem subscale, all subscale scores were calculated by summing the raw scores for participant responses within each subscale consistent with the procedure specified by Kovacs (1992).

      Resiliency. The Resiliency Scales for Children and Adolescents (RSCA) is a 64-item self-report instrument that assesses for the presence of specific domains of resiliency, including sense of relatedness (e.g., "There are people who love and care about me"), sense of mastery (e.g., "If I try hard, it makes a difference"), and emotional reactivity (e.g., "When I get upset, I stay upset for several days"; Prince-Embury, 2008; 2009; Prince-Embury & Courville, 2008; 2008a; Prince-Embury, 2010; 2010a; 2010b). Respondents are invited to rate each item using a 5-point Likert scale (0="Never", 4="Almost Always"; Prince-Embury, 2008). Previous research supports the internal consistency of the RSCA across diverse samples of American adolescents, including a validation sample of non-referred community adolescents (α = .93; Prince-Embury, 2010), adolescent inpatients (α = .91 to .94; Kumar, Steer, & Gulab, 2010), and juvenile offenders (α = .91 to .94; Mowder, Cummings, & McKinney, 2010). Furthermore, the RSCA has been found to have strong convergent validity with youth self-report measures of psychological distress and symptoms of psychopathology, as well as the predictive utility of the RSCA to discriminate between clinical and non-clinical youth (Prince-Embury, 2008). In addition, a confirmatory factor analysis that utilized a stratified sample of 650 adolescents aged 9 to 18 found strong support for a three-factor model of youth

resiliency that included sense of relatedness, sense of mastery, and emotional reactivity (Prince-Embury & Courville, 2008). For the present study, resiliency was estimated using the three identified indicators of resiliency (see Figure 1), which included summed raw scores for each of the three resiliency scales. In addition, given that emotional reactivity is scored such that higher scores indicate greater risk (i.e., more emotional lability), this study reverse scored this subscale to allow for consistent estimation of a single latent factor for resiliency, as well as to allow for the consistent interpretation of mediated effects within the revised structural model.

Suicidal Ideation. The Minnesota Multiphasic Personality Inventory - Adolescent Version (MMPI-A) is a 478-item broadband measure of personality functioning and psychopathology developed for adolescent populations (Butcher et al., 1992; Archer, 2005; Graham, Archer, Tellegen, Ben-Porath, & Kaemmer, 2006). Although the MMPI-A is primarily an actuarial instrument that employs a criterion-keyed approach without face validity for individual items, the MMPI-A also includes several content scales comprised of items that are obvious in content (i.e., face valid). The proposed study included aspecific subset of four items (e.g., "I sometimes think about killing myself"; "Most of the time I wish I were dead") from the content scales that comprise the Adolescent Depression - Suicidal Ideation (A-dep4) content component scale. These items were utilized as indicators of a latent factor for suicidal ideation, and served as the primary outcome for the study. Few studies have explicitly evaluated the psychometric properties of the A-dep4 component scale apart from the normative validation sample collected during the development of the MMPI-A (Archer, 2005). Indeed, previous research has demonstrated strong validity and reliability of the parent A-

dep scale, including convergent validity with other self-report measures of depression among adolescent inpatients (Archer & Gordon, 1991b). In regard to the component scales, Sherwood and colleagues (1997) identified four specific dimensions of the A-dep content scale, including the suicidal ideation component scale, which was found to have strong psychometric characteristics in a sample of inpatient adolescents during the initial validation study of the MMPI-A. For this study, the component subscale items were reverse-coded such that affirmative responses (i.e., "true") were scored as 2 and negative (i.e., "false") responses were coded as 1.

Demographics. Age (i.e., years), biological sex, identified gender, sexual orientation, ethnicity, first language, religious identification, adoption status, and educational level were collected from hospital admission records completed by the patient and their parent or guardian upon intake to the adolescent unit. Parent educational level and household income were not consistently available via electronic medical records and thus were not able to be included in this study.

Psychiatric History. Basic information concerning chief complaint, presenting concerns, diagnoses at admission, and history of previous psychiatric hospitalizations were ascertained from medical records to characterize the nature of the sample to be included in the chart review study. Given that diagnoses at admission are not offered via a structured diagnostic instrument, these diagnoses were not included in subsequent analyses, and are offered as descriptive information only (see Table 1). Additionally data concerning trauma history (i.e., presence/absence of physical abuse, sexual abuse, neglect) was collected from the Standard Mental Health Assessment completed by regional case workers prior to admission to the partnering hospital.

Rurality-Urbanicity. Rurality-urbanicity was assessed using the Index of Relative Rurality (IRR; Waldorf, 2006; Waldorf & Kim, 2015). The IRR is a continuous metric that assesses the degree of rurality within a particular county based upon population size, population density, percentage of urban residents, and distance to the nearest metropolitan area. Values comprising the IRR range from 0.00 to 1.00, with 0.00 representing the most urban and where 1.00 represents the most rural counties. Notably, the IRR addresses the categorical limitations of other attempts to assess rurality and urbanicity by offering a continuous scale rather than discrete categories based on conventional definitions of rurality (Waldorf, 2006). For the present study, participants' permanent address were compared to the most recent (i.e., 2010 census data; Waldorf & Kim, 2015) IRR data that include IRR values by county. Despite the limited application of continuous measures of rurality-urbanicity within the rural mental health literature, several papers across other allied health sciences, as well as scholarship from researchers in rural nations (e.g., Australia, Canada, New Zealand) have asserted the importance of reconsidering flawed typological and categorical approaches to the measurement of rurality and urbanicity. Thus, the present study included IRR scores to assess the conditional effects of rurality within the proposed structural model.

Analyses

Descriptive statistics and zero-order correlations were computed for all study variables. All study variables were assessed for violations of normality. The sexual concerns subscale of the TSCC, the Interpersonal Ineffectiveness Anhedonia, and Self-Esteem subscales of the CDI, and the IRR demonstrated significant skew and kurtosis. A square root transformation was applied to the sexual concerns subscale and yielded a

reasonably normally distributed variable. However, inclusion of the transformed variable within subsequent models did not substantially alter any of the conclusions reached, and thus the un-transformed version of the subscale was included in the final reporting of results. Several transformations were attempted to improve the distribution of the IRR. None of these attempted transformations improved the distribution of the IRR. The skewed variable was included in subsequent analyses, which may have limited the power of structural paths and the latent interaction term that employed to assess the conditional influence of rurality. A frequency distribution that demonstrates the skewness of the IRR is presented in Table 4. Similarly, square root and logarithmic transformations were applied to the CDI subscales, however these transformations yielded increased negative kurtosis and thus the untransformed values were retained.

The amount of data missing for study variables ranged from 1.5% (i.e., IRR) to 21.8% (i.e., Sense of Relatedness). The missing data in the present sample appeared to reflect several factors related to the nature of the setting in which the data were collected, as well as the distress experienced by adolescents upon intake. These potential causes of missing data observed in this sample represented data that were missing at random, as described by Graham (2009). Specifically, there appeared to be missing data within the suicidal ideation items, the observed indicators for the primary outcome, that was missing at random. Missing at random refers to missingness that is conditioned by another observed variable within the dataset (Graham, 2009). This was assessed by evaluating the pattern of missing via the creation of a dummy code (i.e., 1 = missing, 0 = not missing) for whether or not data were missing on the four MMPI-A items used to assess suicidal ideation. Next, zero-order correlations between the dummy-coded variables and other

study variables (i.e., CDI, TSCC, and RSCA subscales, and the IRR) were examined.

There were small statistically significant zero-order correlations between all four MMPI-

A suicidal ideation item missing data dummy codes and the Anhedonia, Mood, and Self-

Esteem subscales of the CDI, such that lower CDI scores were correlated with

missingness (see Table 5). There was also a small significant correlation between

missingness on item 242 of the MMPI-A and the Ineffectiveness subscale of the CDI.

Given this evidence of a correlation between missingness and another observed variable,

and the possibility that differences in symptoms of depression may have influenced

participants' willingness and ability to complete subsequent items, these data were

considered to be missing at random. A similar procedure was employed to evaluate the

association between missingness on the RSCA subscales and other study variables,

however there were no statistically significant correlations between RSCA missingness

and other variables.

Missing data were addressed using full-information maximum likelihood, which

is an appropriate procedure to employ for addressing data that are missing at random.

Full-information maximum likelihood (FIML) is a statistical procedure that estimates

parameters within a model using all available information within the dataset, rather than

imputing values to replace missing cases (Graham, 2009; Dong & Peng, 2013). In

addition to the use of FIML to address missing data for the above noted study variables,

gender comparisons excluded the small number ($n = 2$) of participants who identified as

transgendered.

Due to the nature of the chart review data collected, a priori power analysis was

not performed. That is, the present study included all available cases within the specific

sub-population chosen (i.e., adolescent inpatients admitted to a public psychiatric hospital in the Northwestern State), and thus it would have not have been possible to recruit additional participants in the conventional sense. However, this was not necessarily a limitation for the present analyses given existing guidelines and recommendations for minimum sample size to conduct analyses using Structural Equation Modelling. For example, Kline (2011) recommended that approximately 200 cases was the minimum number needed for trustworthy analyses utilizing Structural Equation Modelling. Similarly, Weston and Gore (2006) also recommended that a sample size of 200 or more was sufficient for most structural models. Furthermore, in regard to group comparison designs, Kline (2011) also recommended that models include at least 100 cases per group. As noted above, the present sample included 550 adolescents, and approximately equal proportions of male (n = 237) and female (n = 311) adolescents, as well as a reasonable number of adolescents in each group based on past history of suicide attempt (attempter, $n = 313$; non-attempters, $n = 237$). In view of these recommendations and the relatively large sample employed for this study, statistical power was not a marked concern for the hypothesized model.

In addition to the above noted guidelines and conventions, MacCallum and colleagues (1996) offered a framework for assessing the sample size necessary to achieve acceptable statistical power based upon the ability to detect models with differing levels of fit (e.g., test of close fit comparing $\varepsilon_0 = .05$ and $\varepsilon_a = .08$, where ε_0 is the root mean square error of approximation (RMSEA) of the null model and ε_a is the RMSEA of the alternative model) relative to the observed data. Using this approach, it was calculated that the hypothesized model would have 153 degrees of freedom based upon the 18

manifest variables included in the hypothesized model. Given that a model with 100

degrees of freedom with an alpha value of .05 would require a minimum sample size of

132 to obtain a power of .8 (MacCallum, Browne, & Sugawara, 1996), the present study

would be considered to be sufficiently powered with a sample of 550 adolescents.

Notably, given the estimators employed for the structural model that included binary

indicators, which included the use of numerical integration, the tested structural model in

this study calculated degrees of freedom for tests of model fit differently than the

equation recommended to calculate minimum necessary sample size using the approach

described above (Rupp, Templin, & Henson, 2010). Nonetheless, the approach described

by MacCallum and colleagues offers additional support for the present study having been

sufficiently powered.

Study hypotheses were evaluated using structural equation modeling. Structural

equation modeling is a general method that can be used to simultaneously test

hypothesized associations among multiple predictor and multiple outcome variables

(Schumaker & Lomax, 2010). In addition to permitting evaluation of multiple predictor

and outcome variables, structural equation modeling allows for explicit estimation of

error terms for observed variables, and evaluation of measurement models for latent (i.e.,

unobserved) variables included in the analysis (Schumaker & Lomax, 2010).

Given that the proposed analyses include multiple unobserved (i.e., latent)

constructs (i.e., trauma-related distress, depression symptoms, resiliency, suicidal

ideation), structural equation modeling offered the ability to evaluate a measurement

model for each latent variable and determine the extent to which observed subscales and

items were adequate indicators of the unobserved variables, consistent with the factor

structures suggested by previous scholarship. This ability to explicitly estimate error

terms and evaluate measurement models was especially important given the nature of the

proposed sample of adolescent psychiatric inpatients in a largely rural Northwestern

State, and the lack of previous scholarship concerning the use of the proposed

instruments with rural inpatient youth. Thus, although previous research supports the

versatile application of the proposed measures, structural equation modeling permitted

explicit evaluation of the factor structure for key study variables within the hypothesized

structural model. The identified measurement models were evaluated for goodness of fit

and adjusted via theoretically-informed and theoretically-coherent review of modification

indices in MPlus (Muthen & Muthen, 1998-2012) to achieve optimal fit. For the

measurement models, models were considered to represent a good fit for the observed

data when the chi-square test of model fit was not significant (i.e., $p > .05$) or the ratio of

the Chi-Square statistic to degrees of freedom was less than three (Ullman, 2001), the

Comparative Fit Index (CFI) and Tucker Lewis Index (TL) were greater than or equal to

0.95, and the Root Mean Square Error of Approximation (RMSEA) was less than 0.05.

Previous research (e.g., Cheng & Rensvold, 2002) has found the chi-square test of model

fit is often significant for large samples, even when models represent reasonably good fit

relative to the observed data.

Subsequent to identification of the measurement model for latent variables, the

hypothesized structural model was evaluated, including the indirect effect of trauma-

related distress and symptoms of depression via resilience (i.e., mediated effects), and

interactions calculated to examine the conditional effects (i.e., moderating effect) of

rurality-urbanicity. Mediated effects were evaluated for statistical significance by

calculating an asymmetric confidence interval (ACI) utilizing the procedure specified by McKinnon (i.e., PRODCLIN; MacKinnon, 2008; Tofighi & MacKinnon, 2011). Interaction terms calculated in MPlus were estimated consistent with the procedure specified by Maslowski and colleagues (2014).

To test the hypothesis that the proposed structural model (see Figure 1) would vary between male and female adolescents, and adolescents with and without a past history of attempted suicide, group comparisons were conducted to examine the extent to which there was measurement invariance across genders and attempter statuses, as well as the extent to which the hypothesized structural relationships differed among study variables. Group comparisons were conducted consistent with the procedure specified by Dimitrov (2006), and included systematic comparison of deviance statistics for structural models that included constrained and unconstrained structural paths. Due to the expected severity of symptom presentations within an inpatient sample, group invariance (i.e., equal factor loadings and structural regression coefficients between the groups) was chosen as the starting point for group comparisons in the present study, and factor loadings and regression coefficients were systematically allowed to vary between groups. That is, although there was a hypothesized conditional effect of gender, some studies (e.g., McCullumsmith, Clark, Perkins, Fife, & Cropsey, 2015) have suggested that gender differences may be attenuated among people in institutional settings (e.g., inpatient psychiatric hospitals, prisons, military contexts). Therefore, the present study assumed group invariance as the criterion model. Structural paths were allowed to be freely estimated one at a time, and models were compared to assess for changes in overall model fit. In view of the sample size employed in this study (N=550), and previous

simulation studies (e.g., Bollen, Harden, Ray, & Zavisca, 2014) that have found the

Bayesian Information Criterion (BIC) to be a more accurate criterion for model selection

relative to other fit indices (e.g., Chi-square test p-values, CFI, TLI, RMSEA) in

moderate to large samples (i.e., ≥ 500 cases), BIC values were compared for the purpose

of selecting a final structural model. Although BIC and AIC values are often considered

primarily within the comparison of non-nested models, several researchers (e.g., Bollen

et al., 2014, Kass & Raftery, 1995; Raftery, 1992) have noted the viability and utility of

Bayesian criteria, including the BIC, for the comparison of nested and non-nested

models. The BIC does not allow for statistical significance testing, and thus the

magnitude of absolute BIC differences between competing models was evaluated using

the criteria proposed by Kass and Raftery (1995). Specifically, absolute differences of six

or more were considered meaningful for the purpose of model comparison and selection.

In addition to the aforementioned studies that support the appropriateness and accuracy of

the BIC for model selection in moderate to large samples, a Bayesian approach was also

chosen to favor a more parsimonious model from among the competing structural models

that were estimated. In contrast, a frequentist approach to model selection, as described

above, was chosen for the selection of competing measurement models due to the robust

and specific a priori factor structures that exist for the measures employed in this study.

In addition, given that numerical integration was not necessary for the estimation of

measurement models, a frequentist approach allowed for the consideration of several

different available fit indices (i.e., CFI, TLI, RMSEA) above and beyond those available

when numerical integration was employed (i.e., AIC, BIC, -2LL).

Given that the dependent variable (i.e., suicidal ideation) was a latent factor that was indicated by dichotomous items from the MMPI-A and that independent variables were latent constructs and observed indicators with some missing data, numerical integration (Muthen & Muthen, 1998-2012) was employed to allow for convergence of the hypothesized model that included dichotomous and continuous indicators within the same structural model using the maximum likelihood estimator with robust standard errors. Numerical integration does not allow for the calculation of incremental fit indices (e.g., CFI, TLI), and thus overall model fit for the structural models was assessed via the Pearson Chi-Square test, and the ratio of the Chi-Square test statistics to degrees of freedom (χ^2/df), whereby a ratio of three or less was considered to represent acceptable fit (Ullman, 2001).

Findings

Descriptives

The present sample of adolescent inpatients reported pervasive histories of

physical and sexual victimization, as well as other forms of trauma exposure.

Specifically, approximately three-fourths of the adolescents ($n = 412$, 74.9%) in this

sample reported some form of trauma exposure (e.g., severe neglect, witnessing domestic

violence, motor vehicle accident, interpersonal violence). Notably, approximately half of

the sample reported exposure to sexual abuse ($n = 278$, 50.5%) or physical abuse ($n =$

280, 50.9%), respectively, and approximately one-third of adolescents indicated histories

of physical and sexual abuse ($n = 175$, 31.8%).

In regard to suicidal thoughts and behaviors, more than half of the adolescents'

records indicated at least one prior suicide attempt ($n = 313$, 56.9%). Among those who

reported one or more previous suicide attempts, the plurality ($n = 141$, 45.1%) indicated

one previous attempt, and those with histories of multiple suicide attempts ranged from 2

to 20 past attempts. The vast majority of respondents endorsed past histories of suicidal

thoughts ($n = 456$, 82.9%), and more than half of adolescents had made suicidal threats

prior to admission ($n = 301$, 54.7%).

Consistent with the significant histories of suicidal thoughts and behaviors noted

above, most of adolescents were admitted due to risk of harm to self ($n = 300$, 54.5%).

Adolescents were also admitted due to risk of harm to self and others ($n = 96$, 17.5), risk

of harm to others ($n = 122$, 22.2%), and grave disability or requests for diagnostic

clarification ($n = 32$, 5.8%). The vast majority of respondents' records ($n = 443$, 80.6%)

indicated that they had previously presented to an emergency department of a general

hospital for psychiatric care. Similarly, most respondents ($n = 477$, 86.7%) had been admitted to an inpatient psychiatric unit prior to their admission to the public psychiatric hospital included in this study. However, the present study only included adolescents' first admission to the public psychiatric hospital involved in this study.

Descriptive statistics for all study measures are reported in Table 2, including estimates of internal consistency for all subscales. Most subscales demonstrated acceptable to excellent levels of internal consistency. However, despite the excellent (Cronbach's $\alpha = .91$) internal consistency of the CDI overall (i.e., full scale), there was considerable variability among the estimates of reliability for the subscales comprising this measure. Specifically, the internal consistency of the Interpersonal problems scale was poor (Cronbach's $\alpha = .46$), and the internal consistency of the Ineffectiveness (Cronbach's $\alpha = .65$) and Anhedonia (Cronbach's $\alpha = .64$) subscales was marginal. Nonetheless, based upon the overall estimate of internal consistency and the intended inclusion of the CDI subscales as indicators of a single latent factor for depression symptoms, the subscales were included in the hypothesized measurement and structural models. Further, the inclusion of CDI subscales as indicators within subsequent models allowed for explicit estimation of measurement error, including error which may be reflected by the limited estimates of internal consistency demonstrated by some CDI subscales. Zero-order correlations among all study variables are reported in Table 3.

Measurement Model

Prior to evaluation of the hypothesized structural model, observed variables (i.e., CDI, TSCC, RSCA subscales, and MMPI-A component scale items) were evaluated as indicators of the hypothesized latent factors of trauma-related distress, depression

symptoms, resilience, and suicidal ideation. All observed indicators and latent variables were included within a single measurement model, and latent variables were allowed to be correlated with one another. Given the hypothesized group comparisons between genders and suicide-attempter statuses, measurement models were assessed for measurement invariance/noninvariance among groups.

First, the measurement model was evaluated holding all factor loadings constant between male and female adolescents, which yielded marginal model fit (χ^2(248) = 485.39, $p < .001$, CFI = .91, TLI = .90, RMSEA = .060; see Figure 2). Upon review of modification indices, it appeared that there were significant correlated residual variances between the emotional reactivity subscale of the RSCA and several subscales of the TSCC and CDI. Given that these correlated error variances were inconsistent with the theory underlying the hypothesized model, and the relatively lower factor loading for the emotional reactivity subscale, the subscales of the RSCA were considered as separate observed variables rather than as indicators of a single latent factor for resilience. Alternatively, a re-specified model that did not include the emotional reactivity subscale did demonstrate acceptable overall fit (χ^2(216) = 337.74, $p < .001$, CFI = .95, TLI = .94, RMSEA = .046), and could be modified to include correlated error variances to achieve good model fit (χ^2(212) = 279.05, $p < .001$ CFI = .97, TLI = .97, RMSEA = .035). However, the exclusion of emotional reactivity from the model was problematic given the salience of emotional reactivity as a predictor of suicidal ideation within previous research (e.g., Rajappa, Gallagher, & Miranda, 2012). An invariant measurement model that did not include a latent factor for resilience demonstrated acceptable overall model fit (χ^2(166) = 265.67, $p < .001$, CFI = .95, TLI = .95, RMSEA = .048). The model was re-

specified based upon modification indices that were theoretically consistent with the

proposed model, and included noninvariant correlated error variances between subscales

of the CDI and TSCC for male and female adolescents. To examine group differences in

the measurement of the latent constructs included in this model (i.e., trauma-related

distress, symptoms of depression, suicidal ideation), factor loadings were systematically

allowed to vary, one at a time, between male and female subgroups (see Table 6). This

included identification of a significant reduction in overall model deviance when the

factor loading for the Ineffectiveness subscale of the CDI was freed within a noninvariant

model. Thus, the final measurement model, including the noninvariant factor loading for

the Ineffectiveness subscale of the CDI, yielded good overall model fit ($\chi^2(162) = 214.75$,

$p = .004$ CFI $= .98$, TLI $= .97$, RMSEA $= .035$; see Figure 3).

Next, a measurement model was evaluated holding all factor loadings constant

between suicide attempters and non-attempters. As was the case in the measurement

model estimated for the sample stratified by gender, the measurement model did not yield

a positive definite variance-covariance matrix for latent factors when the emotional

reactivity subscale of the RSCA was included in the model. Although the emotional

reactivity subscale could have been excluded from the model to achieve acceptable fit

($\chi^2(216) = 319.14$, $p < .001$, CFI $= .96$, TLI $= .95$, RMSEA $= .043$), the emotional

reactivity subscale was retained alongside the other RSCA subscales (i.e., Sense of

Master, Sense of Relatedness) as three independent observed mediators of the association

between trauma-related distress and suicidal ideation. A measurement model was

estimated without including a latent factor for resilience, and demonstrated acceptable

overall fit. As noted for the evaluation of the measurement model for gender groups

described above, factor loadings were systematically unconstrained for attempters and non-attempters to assess for group noninvariance. As is demonstrated in Table 6, there was no statistically significant decrease in overall model deviance when specific factor loadings were allowed to vary freely between suicide attempter subgroups. The model was further re-specified to include correlated error variances between CDI and TSCC subscales, which yielded a final measurement model with good fit ($\chi^2(191) = 308.67$, $p < .001$, $\chi^2/df = 1.62$, CFI = .95, TLI = .94, RMSEA = .048; see Figure 4).

Structural Model

First, the indirect effect of trauma-related distress and depression symptoms upon suicidal ideation via resilience subscales was evaluated for the entire sample (i.e., without including grouping variables; see Figure 5). The model indicated acceptable fit ($\chi^2(6) = 13.79$, $\chi^2/df = 2.30$, $p = 0.32$, BIC = 37576.76), and indirect effects were evaluated by calculating asymmetric confidence intervals (ACI) using the PRODCLIN method, such that ACIs that did not include zero were considered to be statistically significant. This first model demonstrated the significant indirect effect of trauma-related distress via emotional reactivity ($\beta = .05$, ACI = .003 to .100). However, there was not a significant indirect effect of trauma-related distress via either sense of mastery ($\beta = .01$, ACI = -.007 to .046) or sense of relatedness ($\beta = .01$, ACI = -.009 to .022). There was no significant indirect effect of depression symptoms via emotional reactivity ($\beta = .01$, ACI = -.003 to .037), sense of relatedness ($\beta = .07$, ACI = -.037 to .172), or sense of mastery ($\beta = .11$, ACI = -.033 to .245). In contrast, there was a strong positive association (i.e., direct effect) between symptoms of depression and suicidal ideation ($\beta = .82$, $p < .001$). There was not a significant direct effect of trauma-related distress upon suicidal ideation ($\beta = -$

.030, p = 705). In addition, depression symptom also demonstrated significant negative

associations with sense of mastery (β = -.822, p < .001) and sense of relatedness (β = -

.757, p < .001).

Next, participants were compared across specific groups to assess the extent to

which the invariant model described above was conditional upon group membership (i.e.,

gender, suicide attempter status). A group invariant model comparing male and female

adolescents was estimated (χ^2(19) = 19.16, χ^2/df = 1.01, p = .447, AIC = 37853.28, BIC =

38143.71) and compared with subsequent models that systematically allowed structural

paths to vary freely between groups, beginning with the structural paths representing the

association between trauma-related distress and resiliency subscales. Model summary

statistics, including differences in BIC values are reported in Table 7. First, the

associations between trauma-related distress and emotional reactivity was allowed to vary

between male and female adolescents, and did not indicate a meaningful improvement

relative to the group invariant model. Next, a model was estimated that allowed the paths

from trauma-related distress to sense of mastery and sense of relatedness to vary was

estimated, and was also found to represent no improvement relative to the invariant

model. These two paths were allowed to be freely estimated within a single model due to

the theoretical and observed overlap between these variables. As noted in Table 7,

models were also estimated that allowed structural paths between depression and

resiliency subscales to be freely estimated between groups, and did not demonstrate

substantial improvements to model fit on the BIC. Next, the structural paths between the

resiliency subscales and suicidal ideation were evaluated one at a time to assess for group

noninvariance. As with previous models, these noninvariant structural models did not

yield meaningful (i.e., ΔBIC ≥ 6) reductions in model deviance relative to the invariant structural model. Finally, the direct effects of trauma-related distress and depression symptoms, controlling for the influence of resiliency were estimated. These group noninvariant models also did not yield improvements in model deviance relative to the invariant model via decreased BIC values (see Table 7). Thus, there did not appear to be a conditional effect of gender with regard to the structural model, and the group invariant model was retained as the final model.

Similar to the group invariant model for male and female adolescents, the group invariant model comparing adolescents with and without one or more prior suicide attempts also demonstrated good fit (χ^2(19) = 24.03, χ^2/df = 1.27, p = .195, AIC = 37713.27, BIC = 37999.04). As in the group comparison of male and female adolescents, structural paths were again systematically unconstrained and allowed to be freely estimated across groups to evaluate possible improvements to model fit via specific non-invariant paths. Model summary data for all structural models evaluated are presented in Table 8. As with the comparison of male and female adolescents, the structural paths between trauma-related distress and resiliency subscales were evaluated one at a time. None of the noninvariant models that allowed these structural paths to be freely estimated across attempter groups yielded improvements in model fit (see Table 8). Next, the structural paths between resiliency subscales and suicidal ideation were considered in turn. These noninvariant models demonstrated no improvements in model deviance relative to the invariant model. Thus the group invariant model was considered to represent optimal fit and there appeared to be no conditional effect of suicide attempter status.

Conditional Effect of Rurality

To test the hypothesis that there would be a significant conditional effect of rurality (i.e., interaction) with regard to the association between resilience and suicidal ideation, the observed IRR values and an IRR by emotional reactivity interaction term were evaluated as part of the re-specified model that included the RSCA subscales as independent observed mediators in lieu of a latent factor for resilience. Given that emotional reactivity was the only significant mediator of the association between trauma-related distress and suicidal ideation, this was the only conditional indirect effect evaluated.

First, a group invariant model was estimated to evaluate the conditional effect of rurality upon the association between emotional reactivity and suicidal ideation. This invariant model did not indicate a significant interaction between rurality and emotional reactivity, nor was there a significant direct effect of rurality upon suicidal ideation (-2LL =32200.20, BIC = 32577.58). Given the non-significant associations between rurality, the rurality by emotional reactivity interaction term, and suicidal ideation, a follow-up model was estimated that constrained these associations to be zero. This constrained model yielded a significant reduction in overall model deviance (-2LL = 32201.48, BIC = 32566.68; ΔBIC = 11.10), and did not support the hypothesized conditional effect of rurality for a group invariant model.

Next, two different group comparison models (i.e., male and female, suicide attempters and non-attempters) that included this interaction term (i.e., IRR by emotional reactivity) were estimated. An invariant structural model that included the interaction term was estimated for male and female adolescents (-2LL = 32610.40, BIC = 33030.07),

which yielded non-significant path coefficients for both the IRR (i.e., moderator) and the IRR by emotional reactivity interaction as predictors of suicidal ideation. Structural paths were systematically allowed to vary across male and female subgroups to evaluate potential improvements to the model via non-invariant structural paths. However, none of the non-invariant structural models demonstrated significantly improved model fit (e.g., completely unconstrained model, -2LL = 32588.83, BIC = 33093.65), nor did any of the non-invariant models demonstrate significant path coefficients for IRR or the latent interaction term. Given the non-significant structural paths associated with the IRR and the latent interaction term, a follow-up model was estimated that constrained the association between these paths and suicidal ideation to be zero. This constrained model (-2LL=32611.59, BIC=33019.10) yielded a significant improvement in overall model fit when the effect of the IRR and an IRR by resilience interaction were excluded from the model. This finding was also inconsistent with the hypothesized conditional effect of rurality and did not demonstrate any conditional or direct effect of rurality with regard to suicidal ideation across male or female subgroups.

Next, an invariant structural model that included the latent interaction term was estimated for suicide attempters and non-attempters (-2LL =32557.25, BIC =32976.76), which yielded non-significant path coefficients for both the IRR (i.e., moderator) and the IRR by emotional reactivity interaction as predictors of suicidal ideation (See Figure 8). As in previous models, structural paths were systematically allowed to be unconstrained across attempter and non-attempter subgroups to evaluate potential improvements to the model via non-invariant structural paths. Given that none of the non-invariant structural models yielded a significant decrease in deviance (e.g., all paths estimated freely across

groups, -2LL = 32544.97, BIC =33049.60), and that none of the non-variant models indicated a significant association between the IRR or the interaction term and suicidal ideation, a final model was estimated that constrained the association between the IRR and latent interaction and suicidal ideation to be zero. This final model (-2LL=32558.13, BIC=32965.49) indicated that optimal fit was achieved when the direct and conditional effects of rurality were excluded from the model (i.e., constrained to zero). Similar to the failure to detect a conditional effect of rurality across male and female subgroups, this finding did not support the hypothesis that rurality would moderate the indirect effect of trauma-related distress via resilience (i.e., emotional reactivity) with regard to suicidal ideation across suicide attempter subgroups. In sum, there was no evidence of a conditional effect of rurality with regard to emotional reactivity and suicidal ideation, nor were there significant group differences with regard to the interaction term. Nonetheless, the present findings do evidence the relative salience of depression symptoms and trauma-related distress with regard to suicidal ideation among adolescent inpatients, and also demonstrate the indirect effect of trauma-related distress upon suicidal ideation via emotional reactivity above and beyond symptoms of depression.

Discussion

This sample of adolescent psychiatric inpatients reported substantial histories of trauma exposure, physical and sexual victimization, and past suicidal thoughts and behavior. These descriptive findings suggest the importance of research conducted with this under-studied population, and also highlight the need for understanding the specific processes by which suicidal thoughts and behavior may emerge for this at-risk group. Concerning the re-specified structural model and group differences, these findings replicate and extend previous findings concerning the role of depression symptoms and trauma-related distress among adolescent psychiatric inpatients. Specifically, these findings demonstrated the primary salience of depression symptoms as predictive of suicidal ideation, such that symptoms of depression predicted higher levels of suicidal ideation. Depression was the only significant direct effect detected with regard to suicidal ideation within the identified structural model (see Figure 5). Despite the strong significant positive correlation between depression symptoms (i.e., CDI) and trauma-related-distress (i.e., TSCC), there was also a significant indirect effect of trauma-related distress via emotional reactivity. However, neither sense of mastery or sense of relatedness emerged as significant mediators of the association between symptoms of distress (i.e., depression symptoms, trauma-related distress) and suicidal ideation. This pattern of results partially-supported the hypothesized association between trauma-related distress and suicidal ideation via resilience, in that the hypothesized indirect effect of trauma-related distress via resilience was manifest via one subscale of the RSCA, even with a robust self-report measure of depression symptoms included in the model. However, this pattern of findings was inconsistent with the hypothesized model, in that

there was no significant effect of trauma-related distress via sense of relatedness or sense of mastery above and beyond depression symptoms.

The present findings were generally consistent with previous findings (e.g., Waldrop et al., 2007; Wilcox et al., 2014; Bodzy et al., 2015) concerning the association between trauma-related distress, depression symptoms, and suicidal ideation, as both of these measured forms of distress emerged as significant predictors of suicidal ideation via direct and indirect (i.e., mediated) paths. However, the present findings are distinct from previous scholarship, in that the findings of this study demonstrated a strong direct effect of depression symptoms upon suicidal ideation and an indirect effect of trauma-related distress via one domain of resilience (i.e., emotional reactivity). This pattern of findings offers an important contrast relative to previous work conducted among adolescents within the general population (e.g., Waldrop et al., 2007). Specifically, the present sample included adolescents admitted for inpatient care, primarily due to risk of harm to self and risk of harm to self and others. Thus, the emergence of depression symptoms as the only significant direct predictor of suicidal ideation within the hypothesized model may reflect the salience of depressive symptoms for youth who are acutely distressed and unable to maintain their own safety in the community. In addition, the identification of depression symptoms as the strongest predictor (i.e., direct effect) of suicidal ideation within the hypothesized model was also consistent with the circumstances and conditions that lead to inpatient care, in that youth admitted for this high level of supervised care are very likely to be distinct from other adolescent trauma survivors who have not experienced or have not disclosed symptoms of depression to caregivers. Given that previous work conducted among adolescent (e.g., Waldrop et al., 2007) and adult

samples (e.g., Sareen et al., 2015), included nationally representative samples that were not acutely distressed, it is not entirely surprising that direct effect of trauma-related distress was not statistically significant above and beyond symptoms of depression. This difference in populations may also account for how the indirect effect of trauma-related distress upon suicidal ideation, though statistically significant, was less substantial than the direct effect of depression symptoms. Previous work conducted among veterans (e.g., Griffith, 2012) has evidenced similar patterns of non-significant findings with regard to direct effect of posttraumatic stress upon suicidality, and thus the present findings may suggest important differences in contemporary suicidality among those in institutional versus non-institutional settings.

Notably, the magnitude of the indirect effect of trauma-related distress ($\beta = .05$) was considerably smaller than the direct effect of depression symptoms ($\beta = .82$) with regard to suicidal ideation. However, despite the comparative strength depression symptoms as a predictor of suicidal ideation, it is still important to consider the significant mediating influence of emotional reactivity, a potential target for treatment, that emerged with regard to the association between trauma-related distress and suicidal ideation. This significant indirect effect was consistent with the two previous studies identified that explicitly addressed the relationship between PTSD symptoms and suicidal thoughts and behavior in small samples (i.e., Lipshitz et al., 1999, $N = 73$; Havens et al., 2012, $N = 140$) of adolescent inpatients. The present study extended this previous work in several important ways. First, the present study included a large sample of adolescents, and thus is able to offer a more accurate estimate of the effects under consideration via increased statistical power. Next, the present study included a broad conceptualization of

trauma-related distress via a multi-faceted measure of several different trauma-related symptoms, rather than measuring PTSD symptoms or diagnostic criteria alone. This was consistent with the recommendations put forth by Ford and Courtois (2009) concerning the importance of considering multiple domains of symptoms that may result following trauma exposure, including symptoms of posttraumatic stress. This recommendation is particularly important when assessing trauma-related symptoms in children and adolescents, who may manifest unique constellations of trauma-related symptoms, particularly in instances of childhood sexual abuse and/or abuse perpetrated by a caregiver (Ford & Courtois, 2009; Ford & Cloitre, 2009). Next, this study included a robust self-report measure of depression symptoms (i.e., CDI), which permitted suicidal ideation to be regressed simultaneously on both depression symptoms and trauma-related distress. This was a particularly important contribution of the present study, given that previous work (e.g., Lipschitz et al., 1999) did not include depression symptoms within their analyses.

Finally, this study included components of resilience as possible mediators of the aforementioned forms of psychological distress, and identified emotional reactivity as a significant mediator of the association between trauma-related distress and suicidal ideation above and beyond the association between depression symptoms and suicidal ideation, such that a greater emotional regulation skills repertoire (i.e., higher scores on the emotional reactivity subscale) appeared to be protective against contemporary suicidal ideation. This was consistent with previous work by Nrugham and colleagues (2010), who found resilience to be protective against suicidal behavior in a nationwide sample of adolescents in Scandinavia.

Contrary to the hypothesized effects, the present findings do not support the conditional effect of rurality or gender with regard to revised structural model (see Figure 5). Specifically, group invariant models demonstrated optimal fit relative to noninvariant models for gender and suicide attempter subgroups, and thus did not support significant differences between these subgroups within the present sample. Even though previous scholarship has identified robust gender differences in suicidal behavior (e.g., Conner & Goldston, 2007), it may be that the acute distress experienced by male and female adolescents presenting for inpatient care limited the extent to which a gender difference was present in this inpatient sample.

It is also noteworthy that none of the resilience subscales were significant mediators (i.e., protective factors) of the association between depression symptoms and suicidal ideation. Nonetheless, depression symptoms emerged as a strong negative predictor of the sense of mastery and sense of relatedness subscales, but not the emotional reactivity subscale. This pattern of results was somewhat consistent with previous work by Prince-Embury (2008) that found a negative correlation between each facet of resilience (i.e., Sense of Master, Sense of Relatedness, Emotional Reactivity) and symptoms of depression, however inconsistent with the same study, which found resiliency subscales to be correlated with symptoms of anxiety and anger. In contrast, trauma-related distress was significantly negatively associated with emotional reactivity, but not sense of relatedness or sense of mastery. It may be that the strong negative associations between depression symptoms and resilience subscales represented a suppressing effect of depression symptoms with regard to the overall protective influence of resilience, and thus limited the ability to detect indirect effects of distress via sense of

mastery or sense of relatedness. Furthermore, this pattern of results also reflects the important differences that exist between symptoms of depression and trauma-related distress. Thus, the lack of an indirect effect of depression upon suicidal ideation via any of the resiliency subscales, and the observed associations between depression and trauma-related symptoms and particular subscales of the RSCA, offer important implications for future research and clinical intervention, which will be discussed below.

Although previous literature (e.g., Hirsch & Cukrowicz 2014; Fontanella et al., 2015) suggests that there are significant differences between people from urban and rural areas with regard to suicidal thoughts and behaviors, the findings of this study did not support a significant association between rurality (i.e., IRR values) and suicidal ideation, nor was there evidence of a significant rurality by emotional reactivity interaction. This failure to detect an effect may have resulted from the significant non-normal distribution (i.e., bimodal distribution) of the IRR variable, which also was somewhat restricted in range (i.e., 0.38 to 0.65). There was a small (i.e., $r = .11$, $p < .01$) significant zero-order correlation between the IRR and suicide attempter status, which indicated that increased rurality was significantly correlated with having made one or more suicide attempts. This is consistent with previous scholarship that has found higher rates of suicidal behavior in populations of adolescents (e.g., Fontanella et al., 2015), however reflects a limited influence of rurality within the present sample of psychiatric inpatients.

Limitations

The present findings should be considered in view of several limitations. First, the chart review methodology employed relies upon clinical data that were collected by direct care workers within the context of inpatient care. Although this type of practice-

based evidence offers an enhanced degree of external validity with regard to the ecological relevance and potential utility of these findings, this type of data is limited by the absence of a strictly standardized data collection procedure and potential variability in assessment administration by different clinicians. It is also possible that clinicians and psychometricians made errors in scoring assessment measures, however this was addressed via the inclusion of raw test data for the present study. Another limitation of the chart review method utilized for this study was the inconsistent and incomplete reporting of family income and parental educational attainment. Given the inconsistency in the availability and quality of these data, the present study did not explicitly account for either of these measures of socio-economic status (SES). The inclusion of the IRR does account for this to an extent, however these findings are still limited by the potentially confounding influence of SES and access to resources. Similarly, structured diagnostic evaluations were not uniformly conducted with adolescent inpatients, and thus it was not possible to distinguish between adolescents based upon specific psychodiagnostic criteria (i.e., DSM-5 criteria). Given this concern as to the fidelity of psychiatric diagnoses, the principal investigator chose not to include psychological diagnoses as predictors or outcomes within the present study, which may have prevented this study from detecting meaningful variation across distinct syndromes.

Furthermore, these data are limited by the self-report and retrospective nature of the standardized assessments administered, as well as the self-report and retrospective nature of the standardized mental health assessment that was utilized to gather psychosocial, psychiatric, and socio-demographic background variables. In regard to the measurement of rurality, the present study was unable to assess lifetime history of

rurality, and instead based the chosen measures of urbanicity-rurality on the home address of adolescents at the time of admission. Therefore, it is possible that recent changes in adolescents' rurality prior to intake may have confounded the ability of this study to detect an association between rurality and suicidal ideation. Also in regard to rurality, the skewed distribution of the rurality variable may have limited the statistical power the analyses employed, and warrants additional consideration as to how rurality is best measured in a manner that is ecologically meaningful and statistically viable within the context of multivariate analyses.

Next, given the cross-sectional nature of the data collected, it is not possible to offer causal inferences concerning the hypothesized model. Indeed, it is likely that many of the effects under consideration are, to an extent, bidirectional in nature. Nonetheless, the suggested mediational framework was consistent with previous research and theory concerning the indirect effect of psychological distress (i.e., depression symptoms and trauma-related distress) upon contemporary suicidal ideation. Finally, given the specific nature of the present sample, which only included adolescents admitted for inpatient care at public psychiatric hospital in a rural State, these findings may not generalize to populations of adolescent inpatients in other contexts or adolescents who were not admitted to inpatient care. Notwithstanding these limitations, the present findings do offer new insight concerning the role of depression symptoms, trauma-related distress, and emotional reactivity among adolescent inpatients with regard to contemporary suicidal ideation, and yield important implications for future research, clinical intervention, and policy initiatives.

Implications

The present findings offer several possible directions for future research concerning the associations among depression symptoms, trauma-related distress, resilience and suicidality in at-risk populations of adolescents. First, future studies could employ more in-depth assessments of suicidal thoughts and behavior to assist in explicating different patterns of risk and resilience that may emerge from trauma-related distress in adolescents admitted for inpatient care. For example, considering specific antecedents of suicidal thoughts and behavior (e.g., thwarted belongingness, perceived burdensomeness, and acquired capability; Joiner, 2005) may better explain the known association between trauma exposure, trauma-related distress, and suicidality. Of particular importance for adolescents with significant histories of trauma and suicidal behavior, as in the case of the present sample, would be more detailed exploration of the ways in which the physical and psychological provocation associated with experiences of trauma and victimization (see Joiner et al., 2007) may lead to increased risk of suicidality before, during, and following hospitalization.

Next, future research should employ longitudinal and prospective research methods to better understand the experiences of youth over time, and how inpatient care, including distress upon intake, may portend long-term patterns of suicidal behavior and/or repeated hospitalization. Outcomes like re-admission and subsequent suicidal thoughts and behavior have critical consequences concerning the health and wellness of youth following discharge from inpatient care. It may be that these types of outcomes are especially malleable via enhanced resiliency (i.e., interpersonal connectedness, sense of mastery) and mitigation of trauma-related distress. That is, although depression

symptoms emerged as a particularly salient predictor of suicidal ideation upon intake, trauma-related distress may represent a more durable domain of distress that unfolds over time, as has been suggested by previous scholarship (e.g., Cloitre, Cohen, & Koenen, 2006; Havens et al., 2012; Ford & Courtois, 2009).

Therefore, although depression is clearly the stronger predictor of suicidal ideation within the present sample, trauma-related distress may be important to consider within the context of discharge and long-term treatment planning. In addition to considering the time course of specific symptom presentations within and without the context of inpatient treatment, the present findings also suggest the viability of implementing a robust standard intake battery among adolescents presenting for inpatient care, as well as the importance of the effective assessment of trauma-related distress, depression symptoms, suicidality, and resilience. That is, such an assessment may offer clinicians and other members of the treatment team the enhanced ability to triage the presenting concerns of patients responsive to the salience of depressive and/or trauma-related symptoms, to better inform the selection of treatment protocols while admitted to inpatient care and post release recommendations. Furthermore, the present findings suggest the particular importance of emotional reactivity as a domain of resiliency skills that may be protective for inpatient youth with regard to suicidal ideation, and offer a potentially malleable point of therapeutic intervention.

Several extant treatment paradigms explicitly address the process of identifying and modifying intense and/or aversive emotional reactions, including those that occur within the context of trauma related-distress. For example, a recent study of adolescent inpatients ($N = 50$) found that Dialectical Behavior Therapy (DBT) was an effective

intervention for youth suffering symptoms of PTSD and depression via the mechanism of emotion dysregulation, such that DBT skills training yielded a decrease in emotion dysregulation, which in turn yielded reductions in post-treatment symptoms of depression (Espil, Viana, & Dixon, 2016). Dialectical behavior therapy is a third wave treatment approach that synthesizes technologies of acceptance and change to address psychological distress, including emotional lability and suicidal behavior (Linehan, 1993). DBT includes skills training in interpersonal effectiveness, emotion regulation, and distress tolerance, as well as a core focus on mindfulness that is interwoven throughout specific skills repertoires (Linehan, 1993).

The recent findings from Espil and colleagues (2016) converge with the present study concerning the utility of emotion regulation skills (i.e., emotional reactivity) to address symptoms of depression, including suicidal ideation, among adolescent inpatients. These findings are divergent from the present findings in that these researchers conceptualized depressive symptoms as an outcome predicted by PTSD symptoms (Espil et al., 2016). In contrast, the present study conceptualized depression symptoms as a predictor of suicidal ideation alongside trauma-related distress as a way to account for the important overlap that exists between these distinct but related domains of psychological distress. However, it is also important to note that the recent work of Espil and colleagues (2016) was prospective in nature, and thus the differences in hypothesized relationships between trauma-related distress, depression, and emotion dysregulation are perhaps most reflective of this difference in design.

In addition to the specific findings regarding emotional dysregulation noted above, several studies have established the acceptability and efficacy of DBT as a

treatment approach for adolescents suffering a range of presentations (Miller, Rathus, & Linehan, 2007), including those reporting clinically significant trauma-related distress (e.g., Hodgon, Kinniburgh, Gabowitz, Blaustein, & Spinazzola, 2013), symptoms of depression (Espil et al., 2016), and chronic suicidality (e.g., Mehlum et al., 2014; Rathus, Campbell, Miller, & Smith, 2015). Thus, the present findings support continued translational research and clinical efforts that incorporate the skills training and therapeutic principles of DBT and other third wave therapies (e.g., Acceptance and Commitment Therapy [ACT]; Hayes, Strosahl, & Wilson, 2011) as a means of address suicidal ideation via increased emotion regulation skills among clinical populations of adolescents who report clinically significant impairment or distress following traumatization and victimization.

Moreover, the present finding that depression was a strong positive predictor of suicidal ideation, and negatively associated with resiliency skills, highlights the possible utility of therapeutic approaches designed to address symptoms of depression, including symptoms of suicidal ideation among youth exposed to histories of trauma and victimization. One such approach which has been found to be effective among adolescents, including adolescent inpatients, is Cognitive Behavioral Therapy (CBT; Spirito, Esposito-Smythers, Wolff, & Uhl, 2011; Klein, Jacobs, & Reinecke, 2007). Although there is considerable overlap between the techniques of CBT and DBT, CBT is centered primarily on techniques for noticing and modifying problematic patterns of thought and behavior, and does not explicitly include the specific techniques related to acceptance and non-judgement of difficult or untenable circumstances and emotions that are a focus of DBT skills training. Thus, it is important that clinicians consider the

relative salience of presenting concerns among adolescent inpatients, and select a therapeutic approach that is consistent with particular symptom presentations. In the case of adolescents who present with a primary concerns related to depression, and given the strong association between depression and suicidal ideation in the present sample, CBT has been shown to be an effective intervention for addressing suicidal thoughts and behavior within the context of inpatient care for adolescents (Spirito et al. 2011).

In regard to policy implications, the present findings highlight the concerning prevalence of trauma exposure and victimization among adolescent inpatients in this sample. As noted by previous researchers (e.g., Finkelhor, 2009), primary prevention of child and adolescent victimization should remain a key focus of efforts to address the myriad negative sequelae of childhood trauma and abuse. Such efforts may include educational programs that assist children in identifying and avoiding dangerous situations, as well as initiatives to promote disclosure and treatment-seeking via reduced public stigma related to childhood victimization, particularly childhood sexual abuse (Finkelhor, 2009).

As noted above, these findings also demonstrate the need for effective and evidence-based interventions within the context of inpatient care for adolescents, which includes appropriately resourced efforts to implement trauma-informed care for youth at each stage of the referral and admission process for inpatient care. Given the high rates of trauma exposure and victimization reported in this sample, it is reasonable to assert the need for trauma-informed approaches to care via institutional and agency-level policies that effectively consider the needs of trauma survivors. Previous studies have found that even relatively circumscribed efforts to train hospital staff and instantiate basic principles

of trauma-informed care within an agency may yield important benefits for adolescents admitted to inpatient care. For example, a recent chart review study conducted by Azeem and colleagues (2010) found that the implementation of trauma-informed policies and staff training in trauma-informed care led to significant reductions in the use of seclusion and restraint among adolescent inpatients. Considered in view of the present findings, which suggest high rates of trauma exposure and suicidal behaviors in this sample of adolescents, it is imperative that agencies, institutions, and other policymakers consider ways in which trauma-informed policy may empower and enable effective psychiatric care for at-risk youth, particularly those who have suffered trauma.

Conclusion

Taken together, this study demonstrates importance of considering symptoms of depression and trauma-related distress as predictors of suicidal ideation among adolescent inpatients via direct and indirect pathways. In particular, depression emerged as the strongest predictor of suicidal ideation, and may be especially important to consider among youth who are highly distressed upon admission to inpatient care. However, trauma-related distress also was indirectly associated with suicidality via emotional reactivity, which may suggests the importance of implementing interventions and treatment planning that enhance inter- and intra-personal skills to promote resilience (e.g., DBT). Additional research is necessary to better understand the prospective importance of these specific forms of distress, including possible differences concerning the long-term implications of trauma-related distress compared to symptoms of depression upon intake.

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Table 1

Primary psychiatric diagnoses at discharge

Diagnosis	N	%
Mood Disorder, NOS	190	34.5
Major Depressive Disorder (MDD), Recurrent	108	19.6
Posttraumatic Stress Disorder (PTSD)	85	15.5
Disruptive Mood Dysregulation Disorder (DMDD)	40	7.3
Disruptive Behavior Disorder, NOS	18	3.3
Schizophreniform Disorder	10	1.8
Autism Spectrum Disorder	8	1.5
Bipolar Disorder	8	1.5
Oppositional Defiant Disorder (ODD)	8	1.5
Parent-Child Relationship Problem	7	1.3
Schizoaffective Disorder	7	1.3
Pervasive Developmental Disorder (PDD), NOS	6	1.1
Child/Adolescent Antisocial Behavior	5	0.9
Schizophrenia	5	0.9

Note. Primary Diagnoses with less than 5 cases were excluded to protect patient

confidentiality. NOS, not otherwise specified.

Table 2

Descriptive statistics for variables of interest

Variable	*M*	*SD*	Range	α	*n*
TSCC Subscales:					
Anxiety (9 items)	8.61	5.66	0-25	0.85	504
Depression[a] (9 items)	9.78	4.95	0-21	0.85	508
Posttraumatic Stress (10 items)	12.15	6.89	0-30	0.88	505
Sexual Concerns (10 items)	5.83	5.62	0-43	0.73	498
Dissociation (10 items)	10.54	6.44	0-30	0.85	503
Anger (9 items)	9.97	5.96	0-27	0.88	491
RSCA Subscales:					
Emotional Reactivity (20 items)	41.01	15.13	0-78	0.91	446
Sense of Mastery (20 items)	45.76	14.87	3-80	0.93	441
Sense of Relatedness (24 items)	58.60	18.85	2-96	0.94	430
CDI Subscales:					
Negative Mood (6 items)	4.28	2.94	0-12	0.77	523
Interpersonal Problems (4 items)	1.57	1.42	0-8	0.46	525
Ineffectiveness (4 items)	3.27	2.15	0-9	0.65	521
Anhedonia (8 items)	5.50	3.40	0-23	0.64	523
Negative Self-Esteem[a] (4 items)	2.65	2.47	0-8	0.83	525
IRR	0.46	0.07	0.38-0.65	-	542
MMPI-A: SI Component Scale	*Responded 'True' n(%)*		1-2[b]	0.73	
Item 177	320 (58.2)		-	-	490
Item 242	176 (32.0)		-	-	489
Item 283	193 (35.1)		-	-	489
Item 399	197 (35.8)		-	-	490

Note. [a], suicidal ideation items excluded. [b], MMPI-A items were reverse-scored, such that 1=False and 2=True. SI, Suicidal Ideation.

Table 3

Zero-order correlations among study variables

Variable	10.	9.	8.	7.	6.	5.	4.	3.	2.
1. Age in years	.02	.13**	-.04	.00	.06	-.05	.01	.17***	.02
2. Gender	.19***	-.12*	-.13**	-.17***	.24***	.18***	.01	.25***	1.00
3. Suicide Attempt History	.16***	-.01	-.09*	-.11**	.13**	.10*	.11**	1.00	
4. Index of Relative Rurality (IRR)	-.01	-.01	.06	.07	-.03	.02	1.00		
5. Trauma Symptoms Checklist for Children (TSCC)	.55***	-.56***	-.49***	-.48***	.67***	1.00			
6. Children's Depression Inventory (CDI)	.69***	-.39***	-.69***	-.69***	1.00				
7. Sense of Mastery (RSCA - MAS)	-.59***	.29***	.76***	1.00					
8. Sense of Relatedness (RSCA – REL)	-.55***	.28***	1.00						
9. Emotional Reactivity (RSCA – REA)	-.37***	1.00							
10. Suicidal Ideation Content Component Scale (MMPI-A)	1.00								

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

Table 4

Frequency distribution of IRR values

IRR Value	n	Qualitative Descriptor
.35 to .40	151	More Urban
.41 to .45	103	
.45 to .50	117	
.51 to .55	124	
.56 to .60	36	
>.60	11	More Rural

Note. $N = 542$. Continuous values were categorized to protect the anonymity of patient records. Index of relative rurality (IRR) values were not available (i.e., missing) for 8 adolescents.

Table 5

Correlations between missingness on MMPI-A items and CDI subscales

Variable	9.	8.	7.	6.	5.	4.	3.	2.
1. Item 177 Missingness	-.07	-.08	-.13**	-.13**	-.10*	.99***	.99***	1.00***
2. Item 242 Missingness	-.08	-.09*	-.13**	-.13**	-.10*	.99***	.98***	1.00
3. Item 283 Missingness	-.08	-.08	-.12**	-.13**	-.10*	.99***	1.00	
4. Item 399 Missingness	-.07	-.08	-.13**	-.13**	-.10*	1.00		
5. CDI: Anhedonia	.48***	.57***	.65***	.68***	1.00			
6. CDI: Negative Mood	.50***	.58***	.72***	1.00				
7. CDI: Negative Self-Esteem	.46***	.64***	1.00					
8. CDI: Ineffectiveness	.47***	1.00						
9. CDI: Interpersonal Problems	1.00							

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

Table 6

Measurement invariance/noninvariance by gender and suicide attempter status

Measurement Model Description	χ^2	df	p	$\Delta\chi^2(1)^a$	CLI	TFI	RMSEA
Invariant: Gender	221.32	163	.002	-	.95	.94	.048
Non-Invariant (path freely estimated):							
TSCC: Anxiety	218.95	162	.437	2.37	.97	.97	.036
TSCC: Anger	224.94	162	<.001	-3.62	.97	.97	.038
TSCC: Posttraumatic Stress	220.78	162	.002	0.54	.97	.97	.037
TSCC: Dissociation	222.61	162	.001	-1.29	.97	.97	.038
TSCC: Sexual Concerns	226.24	162	.001	-4.92	.97	.97	.039
CDI: Anhedonia	224.70	162	.001	-3.38	.97	.97	.038
CDI: Negative Mood	221.87	162	.001	-0.55	.97	.97	.037
CDI: Negative Self-Esteem	225.77	162	.001	-4.45	.97	.97	.039
CDI: Ineffectiveness (Final Model)	214.78	162	.004	6.54[**]	.98	.97	.035
CDI: Interpersonal Problems	227.17	162	.001	-5.85	.97	.97	.039
Invariant: SA Status (Final Model)	308.67	191	<.001	-	.95	.94	.048
Non-Invariant (path freely estimated):							
TSCC: Anxiety	309.88	190	<.001	-1.21	.95	.94	.048
TSCC: Anger	312.22	190	<.001	-3.55	.94	.94	.049
TSCC: Posttraumatic Stress	307.55	190	<.001	1.12	.95	.94	.048
TSCC: Dissociation	308.78	190	<.001	-0.11	.95	.94	.048
TSCC: Sexual Concerns	308.67	190	<.001	0.00	.95	.94	.048

Measurement Model Description	χ^2	df	p	$\Delta\chi^2(1)^a$	CLI	TFI	RMSEA
CDI: Anhedonia	310.22	190	<.001	-1.55	.95	.94	.048
CDI: Negative Mood	309.62	190	<.001	-0.95	.95	.94	.048
CDI: Negative Self-Esteem	310.68	190	<.001	-2.01	.95	.94	.048
CDI: Ineffectiveness	313.31	190	<.001	-4.64	.94	.94	.049
CDI: Interpersonal Problems	310.16	190	<.001	-1.49	.95	.94	.048

Note. Model descriptions note the factor loading that was allowed to be estimated freely within each model. TSCC = Trauma Symptoms Checklist for Children; CDI = Children's Depression Inventory. [a] Differences in Chi-Square with negative values represent poorer fit relative to the invariant model. [**], p<.01.

Table 7

Group comparison of structural models by gender

Model Description	$\chi^2(19)^a$	p	χ^2/df	AIC	BIC	ΔBIC^b
Invariant: Gender (Final Model)	19.16	.447	1.01	37853.28	38143.71	-
Non-Invariant (paths freely estimated):						
TR-Distress→REA	19.31	.437	1.02	37854.56	38149.26	- 5.55
TR-Distress→REL & MAS	19.22	.443	1.01	37857.08	38156.05	-12.34
DEP-Sx→REA	19.29	.439	1.02	37855.08	38149.78	- 6.07
DEP-Sx→REL & MAS	18.81	.469	0.99	37855.37	38154.34	-10.63
REA→Suicidal Ideation	17.82	.534	0.94	37854.01	38148.70	- 4.99
REL & MAS→Suicidal Ideation	14.11	0.78	0.74	37847.92	38146.89	-3.18
TR-Distress→Suicidal Ideation	15.98	.659	0.84	37854.04	38148.74	-5.03
DEP Sx→Suicidal Ideation	20.62	.358	1.09	37854.67	38149.37	-5.66

Note. Model descriptions note the path(s) that were allowed to be estimated freely within each model. TR-Distress = Trauma-Related Distress. DEP-Sx = Depression Symptoms. REA = Emotional Reactivity. REL = Sense of Relatedness. MAS = Sense of Mastery. [a] all reported chi-square statistics are Pearson's Chi Square for Binary and Ordered Categorical Outcomes, and thus degrees of freedom are 19 for all reported test statistics. [b] BIC values for each candidate model were compared to the invariant structural model (i.e., $BIC_0 - BIC_1$), with negative values representing poorer model fit relative to the invariant model.

Table 8

Group comparison of structural models by suicide attempter status

Model Description	$\chi^2(19)^a$	p	χ^2/df	AIC	BIC	ΔBIC^b
<u>Invariant</u>: Attempter Status (Final Model)	24.03	.195	1.27	37713.27	37999.04	-
<u>Non-Invariant</u>:						
TR-Distress→REA	23.96	.198	1.26	37714.42	38004.46	- 5.42
TR-Distress→REL & MAS	23.89	.200	1.26	37713.91	38008.22	- 9.18
DEP-Sx→REA	19.29	.439	1.02	37855.08	38149.78	- 6.07
DEP-Sx→REL & MAS	23.89	.200	1.26	37713.21	38007.52	- 8.48
REA→Suicidal Ideation	17.82	.534	0.94	37854.01	38148.70	- 4.99
REL & MAS→Suicidal Ideation	24.62	.173	1.30	37717.09	38011.40	- 12.36
TR-Distress→Suicidal Ideation	15.98	.659	0.84	37854.04	38148.74	-5.03
DEP Sx→Suicidal Ideation	20.62	.358	1.09	37854.67	38149.37	-5.66

Note. Model descriptions note the path(s) that were allowed to be estimated freely within each model. TR-Distress = Trauma-Related Distress. DEP-Sx = Depression Symptoms. REA = Emotional Reactivity. REL = Sense of Relatedness. MAS = Sense of Mastery. [a] all reported chi-square statistics are Pearson's Chi Square for Binary and Ordered Categorical Outcomes, and thus degrees of freedom are 19 for all reported test statistics. [b], BIC values for each candidate model were compared to the invariant structural model (i.e., $BIC_0 - BIC_1$), with negative values representing poorer model fit relative to the invariant model.
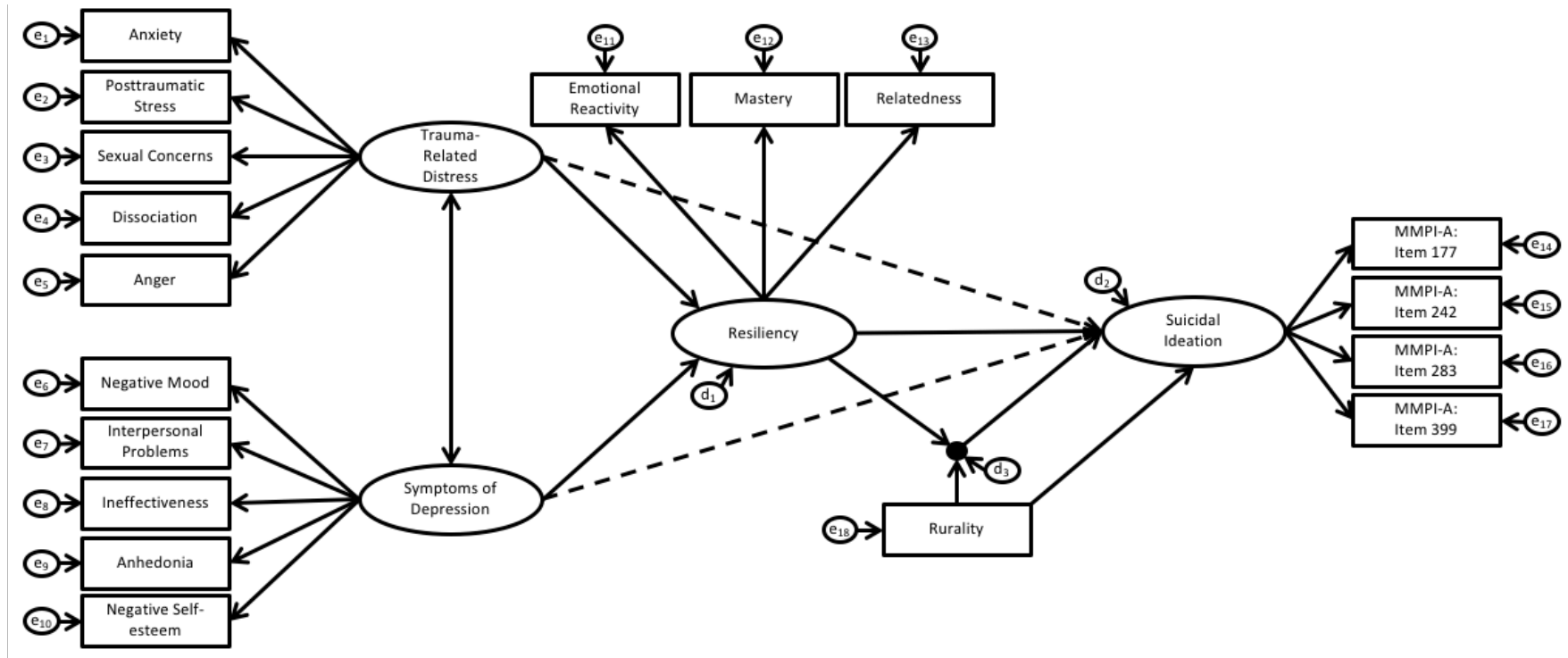
Figure 1. Hypothesized structural model, including interaction of Resiliency by Rurality.
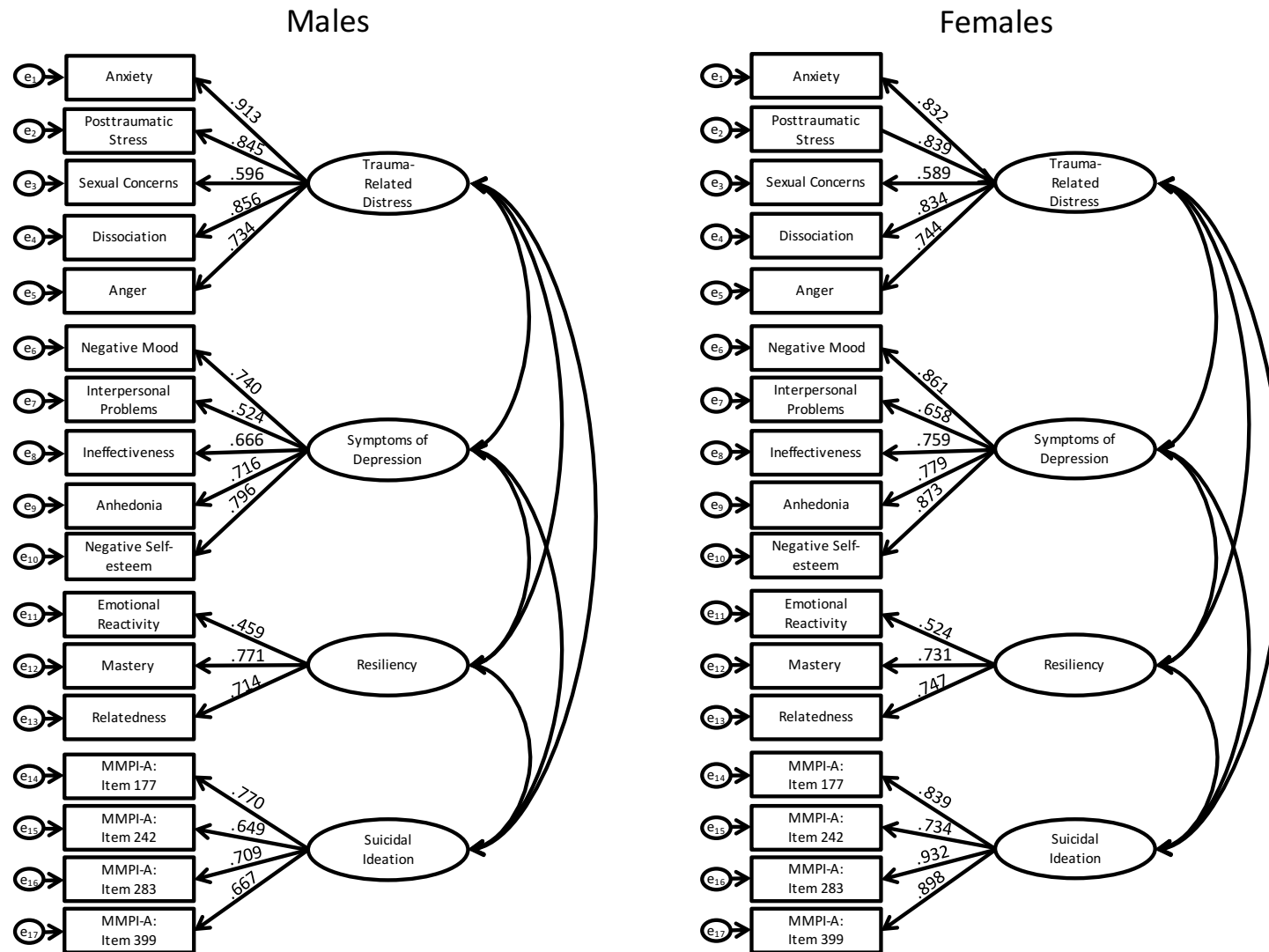
Figure 2. Measurement model including Emotional Reactivity subscale of RSCA. All standardized loadings significant, p <.001.
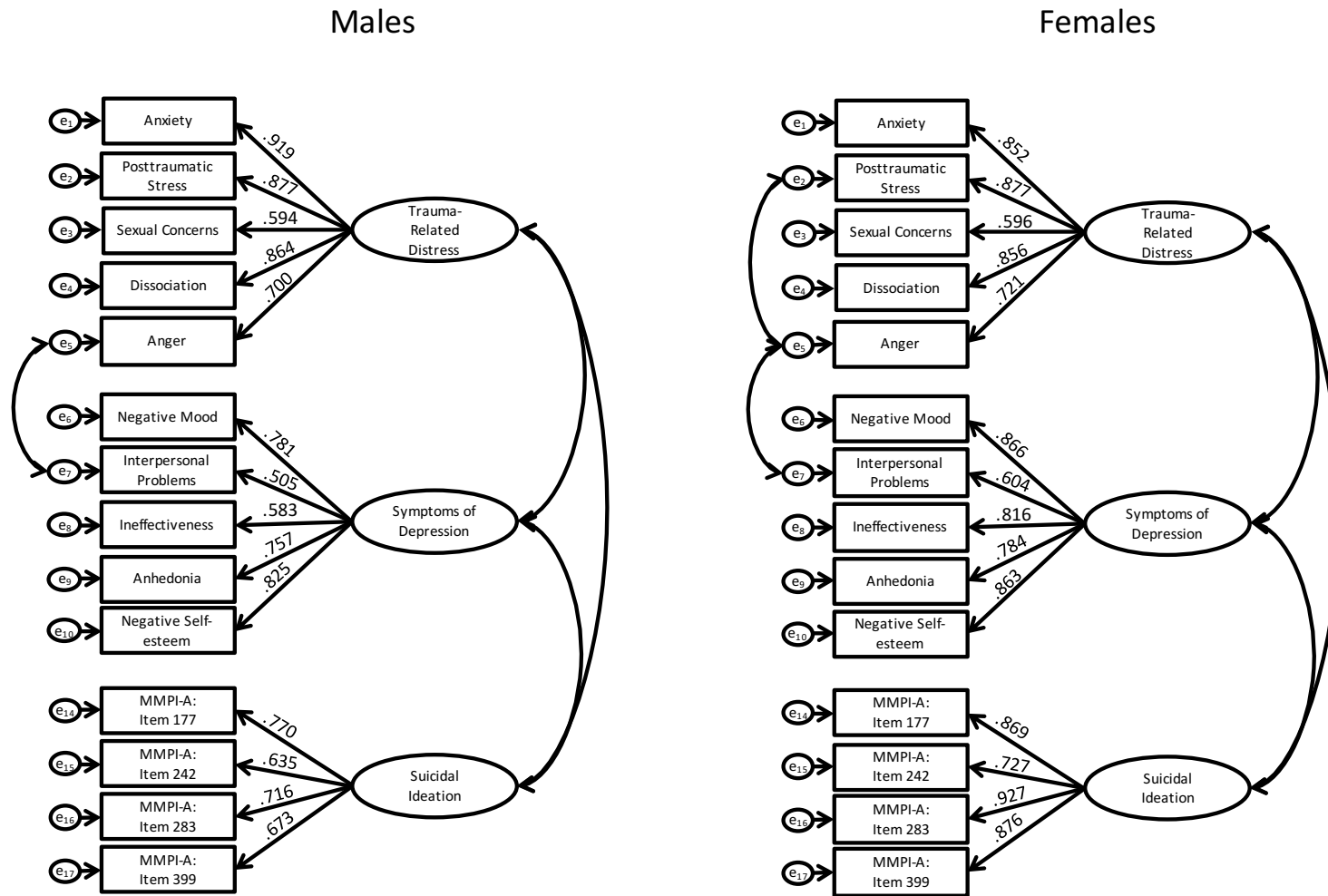
Figure 3. Measurement model excluding latent factor of resilience stratified by gender. All standardized loadings significant, p <.001.
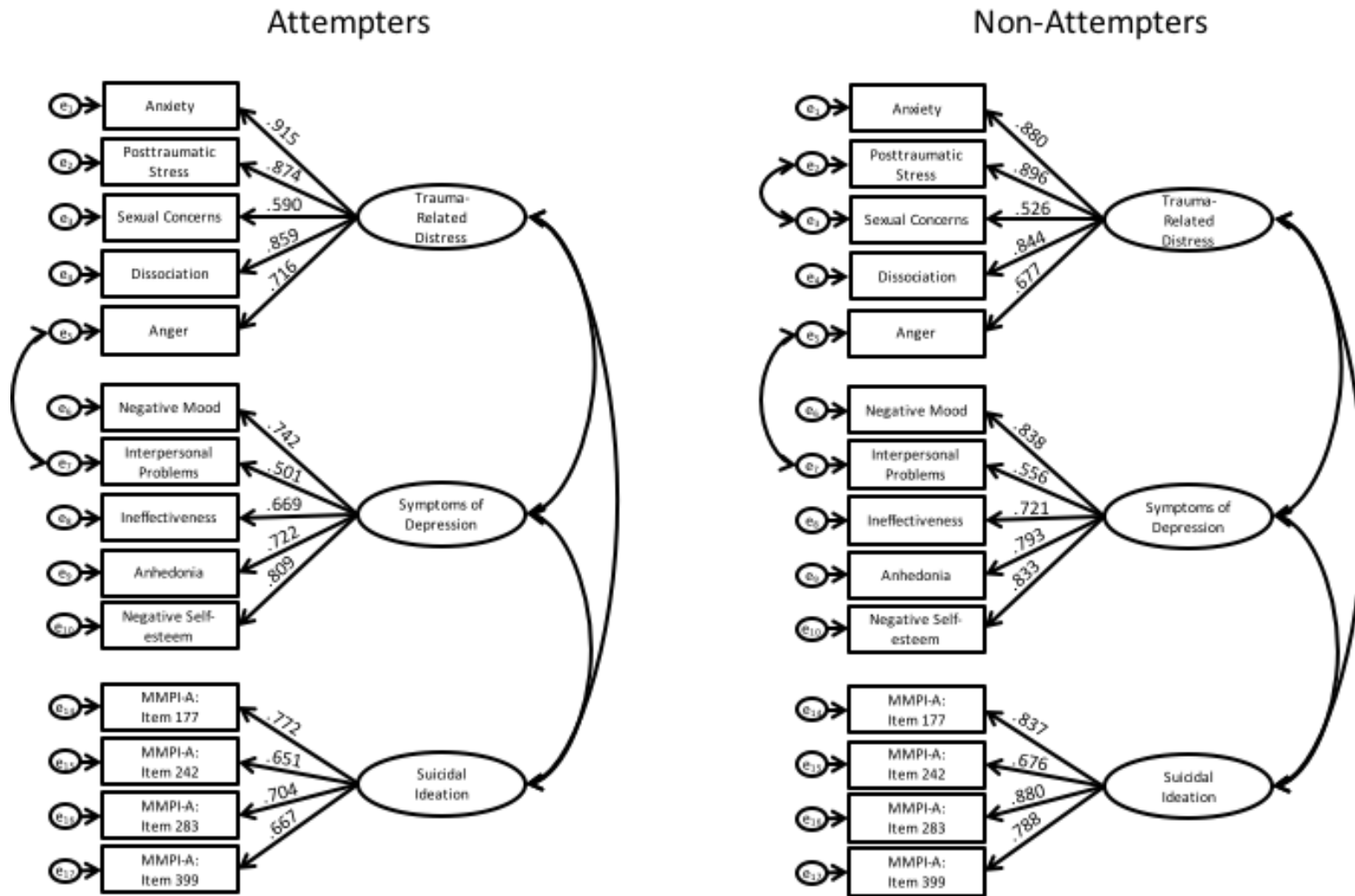
Figure 4. Final measurement model for group comparison of suicide attempters and non-attempters. All standardized loadings significant, p <.001.

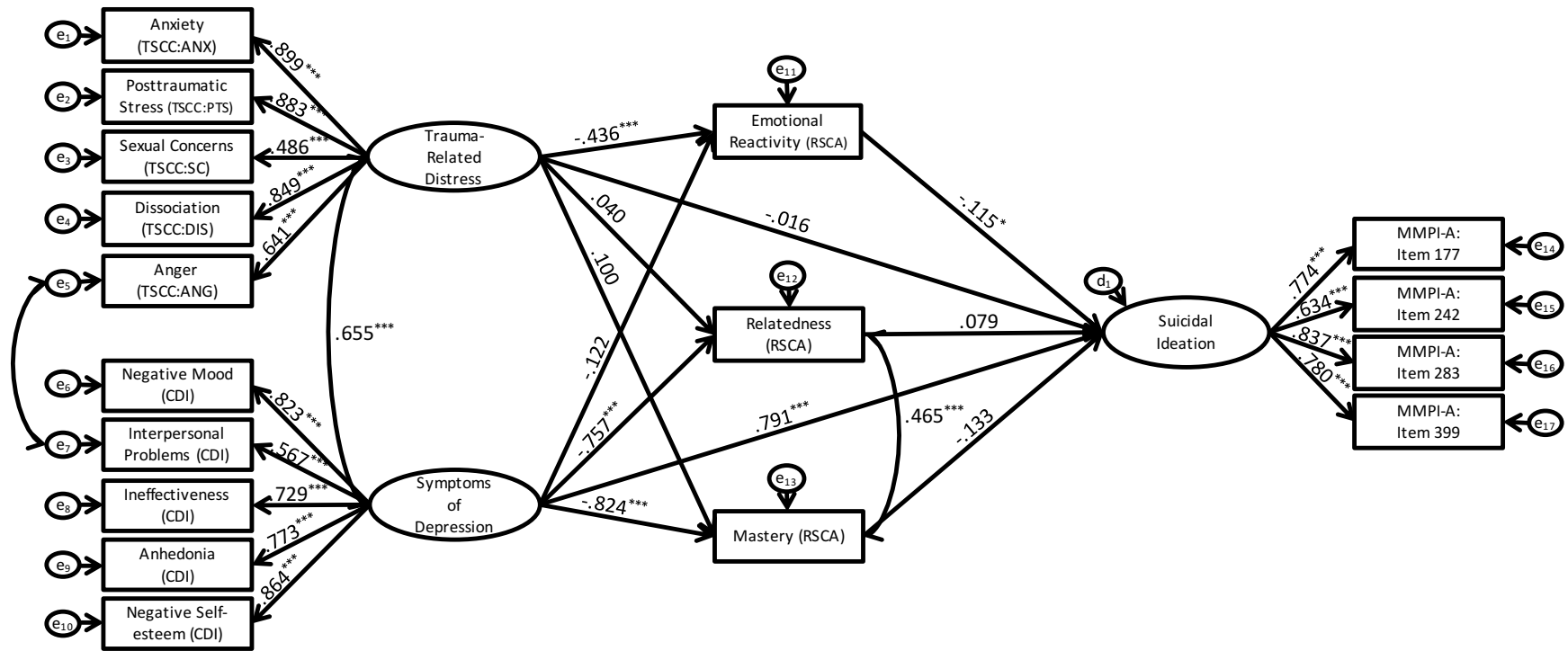Figure 5. Group invariant model evaluating the indirect effect of distress via resilience. *, p<.05. **, p<.10. ***, p<.001. All structural paths and factor loadings are reported as standardized coefficients.