

**PROFILES OF RISK FOR SELF-INJURIOUS THOUGHTS AND  
BEHAVIORS AMONG JUSTICE-INVOLVED FEMALE YOUTH: A LATENT  
PROFILE ANALYSIS**

by

Ana E. Sheehan

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of the requirements for the degree of Master of Arts in Psychology

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Ana E. Sheehan

Approved: \_\_\_\_\_  
Naomi Sadeh, Ph.D.  
Professor in charge of thesis on behalf of the Advisory Committee

Approved: \_\_\_\_\_  
Tania L. Roth, Ph.D.  
Chair of the Department of Psychological and Brain Sciences

Approved: \_\_\_\_\_  
John A. Pelesko, Ph.D.  
Dean of the College of Arts and Sciences

Approved: \_\_\_\_\_  
Louis F. Rossi, Ph.D.  
Vice Provost for Graduate and Professional Education and Dean of The  
Graduate College

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## TABLE OF CONTENTS

LIST OF TABLES .....	vi
LIST OF FIGURES.....	vii
ABSTRACT .....	viii
Chapter	
1. INTRODUCTION.....	1
Risk Factors for Self-Injurious Thoughts and Behavior .....	2
Trauma Exposure .....	2
Minority Stress .....	2
Mental Health Symptoms.....	4
Risky Behavior.....	5
Identifying Profiles of Risk for SITBs .....	5
Present Study.....	7
2. METHOD.....	8
Participants .....	8
Procedures .....	8
Measures .....	9
Mental Health Symptoms.....	9
Risk-Taking Behavior .....	10
Ethnoracial Minority Stress.....	11
Sexual Minority Status .....	11
Data Analysis .....	11
3. RESULTS .....	14
Latent Profile Analysis.....	14
Risk Profile Relations with SITBs Assessed Concurrently .....	15
Risk Profiles as Predictors of Future SITBs .....	15
4. DISCUSSION .....	17
Identifying Profiles of SITB Risk .....	17
Profiles of Risk and SITBs.....	18
Limitations .....	22
Implications.....	23
REFERENCES.....	25

Appendix

A. TABLES.....	32
B. FIGURES.....	34
C. IRB/HUMAN SUBJECTS APPROVAL.....	35

## LIST OF TABLES

Table 1. Fit Statistics for Profiles of Suicide Risk.....	32
Table 2. Risk Profiles Differ on Suicidal Thoughts and Behaviors.....	33

**LIST OF FIGURES**

Figure 1. Justice-Involved Female Youth Classified Based on Indicators of  
Risk for SITBs. .... 34

## ABSTRACT

Suicide represents a leading cause of death among youth in custodial settings. Research investigating risk factors for suicide among youth involved in the justice system has primarily focused on male youth, limiting our understanding of suicide risk among justice-involved female youth. To begin to fill this gap in the literature, the current study investigated profiles of risk for self-injurious thoughts and behaviors (SITBs) in a sample of justice-involved girls. Participants included 238 racially and ethnically diverse girls involved in the justice system (M/SD age = 14.54/1.65, Hispanic/Latinx = 45.7%, Black = 35.1%). Participants completed self-report measures evaluating risk factors for suicide (e.g., mental health symptoms, risk-taking behavior, trauma exposure), and recent engagement in SITBs. Latent profile analysis revealed three distinct profiles. The first profile was characterized by relatively low levels of all suicide risk indicators (n = 102, “Low Risk”); the second profile was distinguished by elevations in internalizing symptom indicators (n = 42, “High-Risk Internalizing”); and the third profile was defined by relatively high levels of all suicide risk indicators (n = 96; “High-Risk Comorbid”). Girls in the profiles elevated on indicators of suicide risk (second and third profiles) reported more SITBs at baseline and a 3-month follow-up assessment than girls in the low-risk profile (profile one). Results suggest that indicators of suicide risk can be used to classify girls in the justice system into profiles that differ concurrently and prospectively on SITBs. These findings highlight the need for assessments evaluating multiple indicators of risk for SITBs in justice settings.



## Chapter 1

### INTRODUCTION

Suicide is the second leading cause of death among 10 to 24 year-olds in the United States, with rates continuing to rise over the last several decades (Centers for Disease Control, 2021). Adolescence represents a critical developmental period characterized by the onset of novel physical, mental, social, and emotional challenges, which heighten risk for self-injurious thoughts and behavior (SITBs), including suicide (Glenn & Nock, 2014; Taliaferro & Muehlenkamp, 2014). Justice-involved adolescents report higher rates of SITBs than the general population, with suicide being a leading cause of death in custodial settings (Casiano et al., 2013; Gray et al., 2002). Estimates suggest that the suicide rate among youth in custodial settings is 21.9 per 100,000 compared to approximately 7 per 100,000 adolescents aged 15 to 19 in the general population (Gallagher & Dobrin, 2006), a startling finding that is due in part to higher rates of risk factors for SITBs among justice-involved youth than the general population (Casiano et al., 2013). Justice-involved girls represent a particularly vulnerable and understudied subset of youth, as they are disproportionately exposed to a variety of risk factors for SITBs compared to their male counterparts (Kerig, 2018; Krupa et al., 2021; Modrowski et al., 2021). However, to date, relatively less work has investigated risk factors for SITBs among female justice-involved youth, despite significant increases in their involvement in the justice system over the last several decades (Stevens et al., 2011). Further, whether well-established indicators of risk differentiate this sample into distinct profiles varying in levels of SITBs remains an empirical question. As such, the current study seeks to

identify and characterize distinct profiles of risk for SITBs among a sample of female adolescents involved in the juvenile justice system.

## **Risk Factors for Self-Injurious Thoughts and Behavior**

### **Trauma Exposure**

One of the strongest known risk factors for SITBs among youth is exposure to traumatic events. A meta-analysis by Zatti and colleagues (2017) found that physical, emotional, and sexual abuse, and physical neglect were all positively associated with future suicide attempts among youth. Compared to their community-based peers, justice-involved youth present with elevated rates of trauma exposure, with some studies reporting as many as 94% of justice-involved youth having been exposed to trauma (Baglivio et al., 2014; Dierkhising et al., 2013). Among justice-involved adolescents, female youth experience higher prevalence rates of abuse, with prior work reporting 37.5% of incarcerated females, compared to 8.4% of incarcerated males reporting lifetime sexual abuse history for example (Conrad et al., 2014). Furthermore, a latent class analysis by Modrowski and colleagues (2021) conducted with justice-involved girls found a polyvictimization class had the greatest levels of suicidal behaviors compared to an emotional victimization class and low victimization class. Findings such as these underscore the need to further examine experiences of trauma for explaining suicide risk among female justice-involved youth.

### **Minority Stress**

An additional relevant environmental risk factor for SITBs that has received considerably less empirical attention is exposure to ethnic or racial discrimination, which can be defined as the unjust, negative, and differential treatment towards others

that is motivated by prejudice (Walker et al., 2017). Minoritized communities are overrepresented in the justice system and are confronted with frequent and early exposure to race-based discrimination (Mendez et al., 2020; Seaton & Douglass, 2014; Stewart et al., 2009), including receiving more severe sanctions within justice settings (Leiber et al., 2011; Moore & Padavic, 2010). Among adolescents, those who reported greater experiences with discrimination also had higher rates of depressive symptoms (Green, Way, & Pahl, 2006), conduct problems (Coker et al., 2009), and general psychological distress (Mendez et al., 2020; Tobler et al., 2013) compared to their peers with lower rates of these experiences. With respect to SITBs, concerning trends have emerged with Latina adolescents attempting suicide at higher rates in 2018 compared to White and Black students (CDC, 2018) along with increases in suicide rates among black youth over time (Sheftall et al., 2021). Walker and colleagues (2017) found a prospective association between perceived discrimination and thoughts of death and dying among a community sample of African-American adolescents. Research has yet to examine the associations of perceived discrimination among a high-risk sample of justice-involved female adolescents, who may face unique forms of discrimination as a function of their intersecting identities (e.g. race, sex/gender) and involvement with the justice system (Burt & Simons, 2015; Crenshaw, 1989). As such, investigations of suicide risk among justice-involved female youth should consider the role of perceived discrimination.

In addition to ethnoracial minority status, identification as a sexual or gender minority is also associated with heightened risk for SITBs (Di Giacomo et al., 2018). Recent scholarship has indicated that sexual and gender minority adolescents are

overrepresented in the justice system, where they experience further stigmatization and exposure to violence (Irvine & Canfield, 2015). A recent study by Hirschtritt and colleagues (2018) found that nearly one-third of court-involved youth identify as a sexual or gender minority, compared to roughly 6 to 8% of youth identifying as a sexual or gender minority in the general population (Wilson & Kastanis, 2015). To date, there is limited data examining the association between sexual minority status and SITBs for justice-involved youth, impeding our ability to characterize risk for suicidality in this sample.

### **Mental Health Symptoms**

Previous research has identified robust associations between serious mental health disorders, including depression, posttraumatic stress disorder, and substance use disorder, and endorsement of suicidality among youth in the general population (Gili et al., 2019). Of increased concern among adolescents in the justice-system are the disproportionately higher prevalence of serious mental health issues compared to community-based samples. A meta-analysis by Vincent and colleagues (2008) report that roughly two-thirds of justice-involved youth meet criteria for a mental disorder, with high rates of comorbidity observed in this population. Despite these staggering rates of psychiatric disorders, justice-involved youth are less likely to receive mental health services, with only 25% to 30% of youth receiving treatment while in detention facilities (Teplin et al., 2005; Young et al., 2007). Left untreated, these mental health disorders place justice-involved individuals at increased risk for engagement in SITBs (Abram et al., 2008). Limited findings have demonstrated that girls involved in the justice system are at increased risk of experiencing mental health disorders, compared

to their male counterparts (Shufelt & Coccozza, 2006; Vincent et al., 2008). However, comprehensive examination of psychological profiles of risk for SITBs among female justice-involved youth remain scarce, limiting our ability to characterize risk for these youth.

### **Risky Behavior**

Adolescence is associated with increased prevalence and escalation of risk-taking behaviors, including substance use, risky sex, and aggressive behaviors (Centers for Disease Control, 2019). Justice-involved adolescents are at significantly greater risk of engagement in these behaviors, and the association between adolescent offending and later risk of attempting suicide has been well-established (Corneau & Lanctot, 2004; Wasserman et al., 2010). Prior work supports the possibility that engagement in risky behaviors reduces negative emotions and provides short-term relief (Auerbach et al., 2010; Cooper et al., 2000). Moreover, recent work has also identified a positive relationship between adolescent health risk behaviors (i.e. risky sex and substance use), mental illness (i.e. depressive symptoms) and a history of trauma exposure (Hallfors et al., 2005; Shrier et al., 2001). These findings underscore the need for research examining the combined impact of these factors for identifying patterns of risk for SITBs within this sample.

### **Identifying Profiles of Risk for SITBs**

Although each of the factors outlined above poses substantial risk for SITBs, the cumulative toll of these factors confers additional risk (Bertuccio et al., 2020; Roberts et al., 2010). Person centered approaches offer a potentially useful method for identifying distinct subtypes of risk for SITBs based on a constellation of known risk

factors. Prior work has used these approaches to study profiles of risk for suicidality among adolescent youth in school settings (Bertuccio et al., 2020; Jung et al., 2019), among sexual and gender minority youth (Giano et al., 2020), among youth in emergency department settings (King et al., 2020), and with nationally-representative samples of youth (Love & Durtschi, 2021). For example, King and colleagues (2019) derived five profiles of SITB risk in youth recruited from emergency departments. Their findings revealed several “high-risk” profiles characterized by different patterns of elevation of symptoms of depression, substance use, aggression, and sexual and physical abuse that were associated with an increased likelihood of a suicide attempt within six months of their initial emergency department visit. Although informative, it is unclear whether these findings generalize to justice-involved girls, given the unique characteristics of this group.

Currently, few studies have used person-centered approaches to model profiles of risk among justice-involved female youth. Work by Modrowski and colleagues (2020) found three distinct classes of victimization among justice-involved female youth based on experiences of adversity, victimization, risk taking behaviors, and posttraumatic stress symptoms. These findings identified elevated risk for SITBs among a polyvictimization class. However, more work is needed to assess the stability of these profiles across samples. Further, inclusion of a greater diversity of SITB risk factors is needed to flush out the psychosocial characteristics of girls in these “risky” profiles. Furthermore, no work to our knowledge has examined the temporal stability of these profiles in predicting future risk in justice-involved girls, information which could be used to inform prevention and intervention efforts.

### **Present Study**

The objectives of the present study were to first identify distinct profiles of risk for SITBs among a sample of justice-involved female youth using an array of established risk factors, including trauma exposure, minority stress, mental health, and engagement in risky behaviors. Our second aim was to examine the association of these profiles with engagement in SITBs assessed concurrently with the risk factors (i.e., baseline). Finally, our third and final aim was to further validate the profiles by examining their relation to SITBs at a three month follow-up assessment. Based upon the literature, we hypothesized at least one “high-risk” profile would emerge and differentiate the sample with respect to concurrent and prospective SITBs.

## **Chapter 2**

### **METHOD**

#### **Participants**

Participants included 257 biologically female juvenile-justice-involved adolescents in a large metropolitan area (11-18 years old, mean age = 14.54; SD = 1.65). Of those individuals, 238 participants had complete data and were included in the analyses. Individuals who were included did not differ from those excluded in the analyses with respect to age, gender, mental health symptoms, risk-taking behavior, experiences of minority stress, or sexual minority status. The majority of participants were in the ninth (26.1%) and seventh grades (20.2%), with the remaining in eleventh grade (15%), seventh grade (12.6%), eighth grade (12.3%), twelfth grade (4.7%), and fifth/sixth grade (7.9%). The sample predominantly identified as girls of color, including Hispanic/Latinx (45.7%), Black (35.1%) or other race (i.e., Asian, American Indian or Alaskan Native, Native Hawaiian; 11.7%). No girls in the sample identified as white. Nearly half of the participants also reported an annual family income of \$15,000 or less (47%).

#### **Procedures**

This study represents a secondary analysis of data collected from a study in a large urban city among girls with justice system involvement. Participants were eligible to participate in the study if they currently or had ever been involved in the juvenile justice legal system, or were considered to be at risk for arrest or incarceration by way of recent police contact, truancy or chronic absenteeism from school, or if their caregivers indicated worry about imminent risk for justice involvement. Juvenile



justice involvement included any contact with the justice system, including diversion services following juvenile court, probation, or re-entering communities following incarceration. In addition, participants were eligible if they were fluent in English, did not have a history of psychosis, and were able to provide informed consent. Consent was obtained from the parents or caregivers of youth participating in the study, and study procedures were approved by the Institutional Review Board of New York University, and the City and State Human Subject's Research offices.

Participants completed a protocol involving self-reports and questionnaires ranging in topics, including psychopathology, experiences of stress, and interactions with multiple systems of care, education and child welfare. Following the battery of assessments, youth and their caregivers were enrolled in a randomized controlled trial experimental design over the course of three follow-up periods (six-weeks, three months, and six months post-baseline). The experimental group was enrolled in the Resilience, Opportunity, Safety, Education, Strength (ROSES) intervention aimed at increasing access to community resources and advocacy for youth over the course of twelve weeks, while the control group did not receive the intervention. For the purposes of the present study, treatment condition was included as a covariate of no interest in the follow-up analyses, as it was not found to predict SITBs at follow-up.

## **Measures**

### **Mental Health Symptoms**

The Massachusetts Youth Screening Instrument-Version 2 (MAYSI-2) was used to assess symptoms of mental health, substance use and risk of suicidality. The MAYSI-2 is a 52-item self-report scale, prompting respondents to read the questions

and select “Yes” or “No” if the statements were true or not “within the last three months.” Subscales for this measure include: Alcohol/Drug Use, Anger/Irritability, Depressed-Anxious, Somatic Complaints, Suicidal Ideation, Thought Disturbances, and Traumatic Experiences. Youth in the present study completed these measures at multiple time points. In addition, alpha scores remain similar across races for all scales. The MAYSI-2 has been widely used and has demonstrated good fit in screening mental health concerns for this population, particularly for girls of color (Zannella et al., 2018). According to the Flesch-Kincaid index, the readability for this measure is at grade level 5. Subscale scores were calculated by taking a sum total score. Adequate internal consistency was demonstrated (median Cronbach’s alpha = 0.78).

### **Risk-Taking Behavior**

The Youth Risk Behavior Surveillance Survey (YRBSS) was created to measure the prevalence of behaviors that increase risk for youth mental and physical health problems as well as assessing the prevalence and frequency of these behaviors. The measure includes 89 multiple choice items; however, for the present study a modified version of the YRBSS was used, deleting 9-items from the original survey. For the purpose of the current analysis a risk-composite variable was created by summing the frequency of risky behavior across indicators of alcohol use, marijuana use, sexual activity, and physical violence in the past thirty days (Cronbach’s alpha = 0.55).

### **Ethnoracial Minority Stress**

The Daily Life Experiences (DLE) is a 20-item self-report scale measuring the frequency and stressfulness of 18 daily experiences related to race (e.g. “Being asked to speak for or represent your entire racial/ethnic group”). The frequency of each event is rated on a six-point Likert scale from (0) Never to (5) Once a week or more. Participants also rated the extent to which these events cause distress ranging from (0) Has never bothered me to (5) Bothers me extremely. A DLE total score was calculated to measure the frequency and bother of each of these events. This measure demonstrates good reliability in previous studies with racially and ethnically diverse populations and good reliability in the present sample (Cronbach’s alpha = 0.95).

### **Sexual Minority Status**

Adolescent sexual orientation was assessed with the item: “Please select your sexual orientation” with the ability to select more than one and options including: asexual, bisexual, heterosexual, homosexual, questioning, pansexual, or other. For the present study, sexual orientation was recoded into a dichotomous variable, such that individuals were grouped as heterosexual (73.83%) versus not (26.17%), given the relatively low prevalence of the individual non-heterosexual options in this sample.

### **Data Analysis**

A SITB composite score was calculated by summing responses for suicide-related questions from the YRBSS and MAYSI-2 scales. The composite score included items such as in the past three months: “Did you ever seriously consider attempting suicide?”, “Did you make a plan about how you would attempt suicide?”, “How many times did you actually attempt suicide?”, “Have you wished you were

dead?”, “Have you felt like life was not worth living?”, “Have you felt like hurting yourself”, “Have you felt like killing yourself” and “Have you given up hope for your life?”. These items were all z-scored to standardize values across the two scales prior to creating the SITB composite variable. A SITB composite was created separately for the baseline (Cronbach’s alpha = 0.88) and three month responses (Cronbach’s alpha = 0.90). Furthermore, given that baseline and six month suicide composite scores were positively skewed (2.44/3.95 respectively) and kurtotic (5.47/ 16.98 respectively), we applied Blom’s transformation to reduce the impact of outliers at the high end of the distribution. This transformation has been utilized in previous work (Sheehan et al., 2021) and is uniquely suited for dealing with asymmetric distributions (Ayán & Díaz, 2008).

To examine whether risk factors for suicidality can be used to separate girls into distinct profiles of SITB risk, we used a latent profile analysis with the following indicators: trauma exposure (MAYSI-2), daily life experiences of racism (DLE), identification as a sexual or gender minority, psychopathology (MAYSI-2; somatic complaints, depression or anxiety, alcohol use, and anger and irritability in the past three months), and risk taking behaviors over the last three months (YRBSS). The latent profile analysis permits the identification of groups or latent classes based on these indicators. We evaluated three latent profile models (2 through 4-classes). Model fit was compared among the three models using Bayesian information Criterion wherein smaller values indicate better model fit. We also compared these models based on entropy (higher values indicate better ability to identify, discern and discriminate among classes), and finally Mendell-Rubin adjusted likelihood ratio test

for which significant p-values indicated that a model with k number of classes is preferred over a model with k-1 classes. Exclusion criteria included any models for which classes contained less than 5% of the sample due to concerns about whether or not the sample may be considered representative of a phenotype of suicide risk. Latent profile analyses were performed in Mplus Version 8.1 using the maximum likelihood robust estimator (Muthen and Muthen, 2013).

Following the identification of an acceptable number of profiles, girls were classified into profiles based on most likely class membership to examine differences between the profiles with respect to SITBs at baseline and then at three months. At baseline, profile comparisons were conducted with one-way ANOVAs with post-hoc analyses using the Games-Howell correction for multiple comparisons and chi-square analyses using z-tests to compare column proportions and adjusted using a Bonferroni correction. A follow-up univariate ANOVA was conducted to examine the association of profiles of risk to SITBs assessed three months later, while controlling for treatment condition. Significant omnibus tests were followed up using Bonferroni correction for multiple comparisons. These statistical analyses were all run in SPSS Version 28.

## Chapter 3

### RESULTS

#### Latent Profile Analysis

To examine our first hypothesis that risk factors for SITBs can be used to identify unique profiles of risk among justice-involved girls, we conducted a latent profile analysis. Model fit for solutions with 2-4 latent classes were examined, and results of these analyses are presented in Table 1 and Figure 1. The Lo-Mendell Rubin adjusted LRT indicated that the model with three profiles showed improved fit over those with one fewer profile. However, the four-profile solution was rejected as the Lo-Mendell Rubin adjusted LRT for three versus four profiles was not significant. Thus, the three-profile solution was selected as the best fitting model, as it demonstrated lower BIC values (1768.289) than the two-profile solution (1916.788). Individuals were then classified according to their most likely class membership. The first profile, labeled “Low-Risk” (42.5% of the sample; n = 102), was the largest profile and was characterized by relatively low levels of risky behaviors, daily minority stress, and internalizing and externalizing psychopathology, as well as greater odds of identifying as heterosexual. The second profile, named “High-Risk Internalizing” (17.5% of the sample; n = 42) was the smallest profile and was defined by average levels of risky behaviors, higher internalizing symptoms, lower externalizing symptoms, average levels of stressful life events, including trauma, and greater odds of identifying as heterosexual. Finally, the third profile labeled “High-Risk Comorbid” (40% of the sample; n = 96), was the second largest group and was defined by high levels of risky behaviors, daily minority stress, and internalizing and externalizing symptoms, as well as greater odds of identifying as non-heterosexual.

### **Risk Profile Relations with SITBs Assessed Concurrently**

We then explored the association of the risk profiles with SITBs at baseline to investigate whether they differentiated girls with a recent history of engaging in suicide-related thoughts and behaviors. Results from a one-way ANOVA indicated that there were significant differences in baseline SITBs between the three profiles ( $F_{(2, 232)} = 15.47$ ;  $p < 0.001$ ). Post-hoc analyses using the Games-Howell correction for multiple comparisons revealed girls in both the comorbid [ $M = 0.58$ ;  $SD = 0.26$ ] and internalizing [ $M = 0.57$ ;  $SD = 0.28$ ] profiles reported more recent SITBs than girls in the low-risk profile [ $M = 0.40$ ;  $SD = 0.17$ ]. However the comorbid and internalizing groups were not significantly different from each other with respect to SITBs.

As a follow-up analysis, we also explored the extent to which the profiles differed in specific types of SITBs (Table 2). Results showed that girls in the “High-Risk Internalizing” and “High-Risk Comorbid” profiles were more likely to report suicidal ideation, plans, and attempts than the “Low-Risk” profile. However, there was no statistical difference between the “High-Risk Internalizing” and “High-Risk Comorbid” profiles on these thoughts and behaviors at baseline.

### **Risk Profiles as Predictors of Future SITBs**

To test the clinical utility of these latent profiles for predicting future SITBs, we examined whether profile membership was associated with suicide-related thoughts and behaviors three months after the baseline assessment. A univariate ANOVA was conducted to compare the effect of profile membership on SITBs at three-months with treatment conditions entered as a covariate. Results from this analysis indicated that there was a significant difference in SITBs between the three

profiles ( $F_{(2, 191)} = 3.79$ ;  $p = 0.02$ ). Post-hoc analyses using Bonferroni correction for multiple comparisons revealed that girls in both the “High-Risk Internalizing” [ $M = 1.44$ ;  $SD = 0.91$ ] and “High-Risk Comorbid” [ $M = 0.58$ ;  $SD = 0.66$ ] profiles endorsed more recent SITBs than the “Low-Risk” profile [ $M = -1.28$ ;  $SD = 0.61$ ]. However, pairwise comparisons between profiles indicated that there was only a significant difference in SITBs at three months between the “High-Risk Internalizing” and “Low-Risk” profiles (Mean difference =  $-2.73$ , 95% CI =  $-5.38$  to  $-0.08$ ,  $p = .04$ ).



## **Chapter 4**

### **DISCUSSION**

Justice-involved youth exhibit higher rates of suicidality compared to their non-system-involved peers (Dixon-Gordon et al., 2012). As such, research examining the negative synergistic effects of risk factors for SITBs in this population are needed. The current study sought to address this gap by examining whether established risk factors for suicide and related behaviors could be used to identify discrete profiles of risk that, in turn, differentiated engagement in SITBs among female justice-involved youth. Using a person-centered analytical approach, we identified three unique profiles of risk that varied on indicators of environmental, psychological, and developmental risk factors. Furthermore, we found that membership in the “High-Risk Comorbid” and “High-Risk internalizing” profiles was associated with elevated rates of SITBs assessed at baseline and three months later compared to the “Low-Risk” profile. Importantly, this work extends upon previous research by unveiling heterogeneity in the psychosocial profiles of girls who report SITBs in a high-risk and understudied population.

#### **Identifying Profiles of SITB Risk**

In order to better understand how previously identified risk factors for SITBs may differentiate justice-involved female youth, we applied a person-centered analytic approach using latent profile analysis. Results of the latent profile analysis revealed three distinct profiles of risk characterized as “Low-Risk”, “High-Risk Internalizing” and “High-Risk Comorbid” based on experiences of trauma, discrimination, mental health, risk-taking behaviors, and sexual minority status. The first class was

characterized as “Low-Risk” containing the majority (42.5%) of the sample with lower rates of environmental, psychological and developmental risk-factors, and greater odds of identifying as heterosexual compared to the other two classes. The “High Risk Internalizing” (17.5% of the sample) profile was characterized by average rates of environmental risk factors (e.g. trauma exposure, discrimination), higher rates of internalizing symptoms (e.g. somatic complaints, depression and anxiety), and below average externalizing symptoms (e.g. alcohol use, risky behaviors) with greater odds of identifying as heterosexual. Finally, the second largest (40%) “High-Risk Comorbid” group had the highest rates of environmental risk factors (i.e. trauma exposure and discrimination), internalizing and externalizing symptoms, engagement in risk taking behaviors, and greater odds of not identifying as heterosexual. The three-class solution was consistent with recent work conducted among high-risk adolescent samples identifying a low-risk, predominantly internalizing, and predominantly comorbid sample of youth (Bertuccio et al., 2020; Fonseca-Pedrero & de Albéniz, 2020). Furthermore, our work extends upon the three-class solution derived from a sample of justice-involved female youth by Modrowski and colleagues (2020), by including multiple indicators of risk in addition to experiences of victimization, thereby accounting for the multidetermined nature of suicide-risk in this sample.

### **Profiles of Risk and SITBs**

Examination of external correlates associated with class membership revealed significant differences in group membership and association with SITBs at baseline. Specifically, “High-Risk Internalizing” and “High-Risk Comorbid” profiles were associated with higher levels of SITBs compared to the “Low-Risk”. In order to assess

the predictive utility of these profiles, we examined their association with SITBs assessed three months later. A univariate ANOVA comparing profiles for SITBs assessed three months later, revealed that class membership in the “High-Risk Internalizing” and “High-Risk Comorbid” group at baseline was still elevated for SITBs at three months, and these groups did not differ in average SITBs. However, post-hoc comparisons revealed only the “High-Risk Internalizing” and “Low-Risk” profiles were significantly different from one another with respect to rates of SITBs at the follow-up assessment. These results contribute to the literature supporting the presence of distinct developmental phenotypes for SITB risk among justice-involved female adolescents and provide preliminary evidence for the predictive utility of these profiles three months later.

Of note, both internalizing psychopathology and externalizing psychopathology have been identified as separate predictors of suicide attempts (Verona et al., 2004; Wanner et al., 2012). However, given the relatively high prevalence of internalizing disorders among female compared to male youth, research has tended to focus on internalizing symptoms and associated risk for suicide (Fergusson et al., 1993). In contrast, significantly less empirical work has examined externalizing symptoms and associated risk for SITBs among female youth, despite comparable rates of substance use and other offenses for males and females during early adolescence (Chen & Jacobson, 2012; Puzanchera & Ehrmann, 2018). Recent work by Comisso and colleagues (2021) found that preadolescent female youth with comorbid pathology were at greater risk of attempting suicide by early adulthood compared to females with only internalizing or externalizing problems alone. Given

that justice-involved female youth demonstrate higher rates of externalizing symptoms compared to community female samples, our findings extend prior research, elucidating the ways in which internalizing and comorbid presentations may represent two distinct developmental pathways impacting risk for SITBs among female youth. These findings underscore the need for screening efforts within justice settings to consider both internalizing and comorbid presentations as risk factors for future SITBs, particularly among female youth.

The present findings also extend upon previous person-centered research by including understudied factors related to experiences of discrimination and minority stress. Given the overrepresentation of minority youth in our sample, and the justice system more broadly (Campbell et al., 2018; Mallett, 2018), it is critical that models of suicide risk apply an intersectional lens (Crenshaw, 1989) and consider the impact of race-related stressors. Our study found that all classes, but particularly the “High-Risk Comorbid” class experienced high levels of daily stressors related to race. This is consistent with findings from Loyd and colleagues (2019) who found that experiences of discrimination among a sample of justice-involved youth were associated with both internalizing and externalizing symptoms, along with trauma exposure, particularly for female identifying youth. Given that these factors were assessed cross-sectionally, their temporal ordering cannot be determined in the present analyses. However, our findings may indicate that daily exposure to racially-motivated discrimination could exacerbate risk for other environmental and psychological risk factors known to heighten risk for suicide. As such, these findings suggest that daily experiences of discrimination should be considered alongside the constellation of risk-factors that

justice-involved youth of color may face. In addition to the need for structural changes to dismantle institutions that perpetuate racial inequity, intervention efforts for these youth should also be tailored to address and manage traumatic-stress related to experiences of discrimination to attenuate risk for SITBs.

Finally, although sexual and gender minority youth are known to have much higher suicide rates compared to heterosexual youth, less is known about the distinct profiles of risk among this sample. In light of the overrepresentation of sexual and gender minority youth in the justice system (Jonsson et al., 2019), the present study provides further insight into the ways in which multiple risk factors may increase overall risk for SITBs. Our finding revealed that individuals in the “High Risk Comorbid” group had greater odds of identifying as a sexual or gender minority compared to the two other classes. This finding is in line with previous research indicating that sexual and gender minority youth also experience higher rates of victimization, substance abuse, and comorbid psychopathology than their heterosexual peers (Baams et al., 2015; Toomey & Russell, 2016). Furthermore, these environmental and psychological risk factors may be exacerbated by further stigmatization and discrimination towards their identity within justice settings, an important question for future study. As such, our findings point to the need for mental health programming in justice settings that address the array of risk factors impacting sexual and gender minority youth, including providing training to staff and justice personnel to facilitate an inclusive and affirming environment for youth who may identify as a sexual or gender minority.

## **Limitations**

The present study considerably adds to our understanding of the mechanisms of risk for suicide in an understudied and underserved population. However, these findings should be understood within the context of several limitations. First, our sample was limited to female identifying youths in a predominantly urban setting, limiting the generalizability of these findings to other geographic locations including rural populations. Indeed, compared to rural settings, youth in urban environments may have greater access to community programming and alternatives to justice involvement (Robles-Ramamurthy & Watson, 2019). As such, the risk factors and needs of rural youth might differ substantially from those in urban settings. Future work should consider replicating and expanding upon these findings to include a wider diversity of geographic settings in order to identify unique risk and protective factors among female justice-involved youth. Second, although the present study did incorporate a broad range of risk factors, these were not comprehensive and inclusion of other risk and protective factors is warranted. For example, prior offense history, neighborhood disadvantage and social support could be important to consider when identifying profiles of risk within this sample. Finally, given the size of our sample, measures of sexual and gender minority status were limited to dichotomous identification as heterosexual versus not. Furthermore, prior research has highlighted the importance of using multiple indices of sexual orientation, including identification and engagement in same-sex behaviors, in order to accurately characterize prevalence of risk in these populations (Liu et al., 2020). Given the overrepresentation of sexual and gender minority youth in these settings, it is important to adopt multiple indices of sexual and gender minority status in order to accurately account for risk in this sample.

## **Implications**

Ultimately, results from this work have important implications for clinical practice and public policy. First, our findings shed light on the importance of using multiple indicators when assessing risk for suicidality among justice-involved youth. In particular, these findings highlight that there are multiple distinct pathways of risk for suicidality in the present sample. To this end, screening tools should be developed and empirically evaluated for use in juvenile justice populations, concurrently assessing for various risk factors. Furthermore, our findings indicate that these profiles do predict differences in SITBs three months later, however differences in SITB risk were no longer apparent between the “High-Risk Comorbid” and “Low-Risk Internalizing”, indicating there may be changes within the indicators of risk entered into our latent profile analysis which could influence the trajectory of these profiles over time. Thus, frequent and comprehensive screening in justice settings may be necessary to evaluate changes in risk indicators over time and ultimately improve early identification and intervention efforts. In addition, given the scope of risk factors and the cumulative effect they have on SITB risk, mental health programming should be adapted accordingly. Specifically, interventions that address multiple factors concomitantly, rather than in isolation, are necessary in order to reduce the high prevalence of SITBs among justice-involved female youth. Finally, system-level changes should also be adopted in order to alter trajectories of risk for these groups. For instance, providing education and training for court staff, officers, detention personnel, community partners, and other juvenile justice personnel to facilitate equitable and inclusive treatment practices could mitigate the frequency of re-traumatization or discrimination within the justice setting. In addition, reallocation of

funds towards prevention programs, an alternative to detention, through community-based and gender-responsive care practices should be evaluated and adopted (Anderson et al., 2019).



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## Appendix A

### TABLES

Table 1. Fit Statistics for Profiles of Suicide Risk

<b>No. Latent classes</b>	<b>Log-likelihood</b>	<b>BIC</b>	<b>Adjusted BIC</b>	<b>LMR-A</b>	<b>Bootstrap LRT</b>	<b>Entropy</b>
2-class	-889.886	1916.788	1837.545	0.05	<0.001	.909
3-class	-787.733	1768.289	1656.347	< 0.01	<0.001	.848
4-class	-747.772	1734.173	1591.534	0.08	<0.001	.868

Note. BIC = Bayesian Information Criterion. LMR-A = Lo-Mendell Rubin-Adjusted Likelihood Ratio Test P-value.



Table 2. Risk Profiles Differ on Suicidal Thoughts and Behaviors.

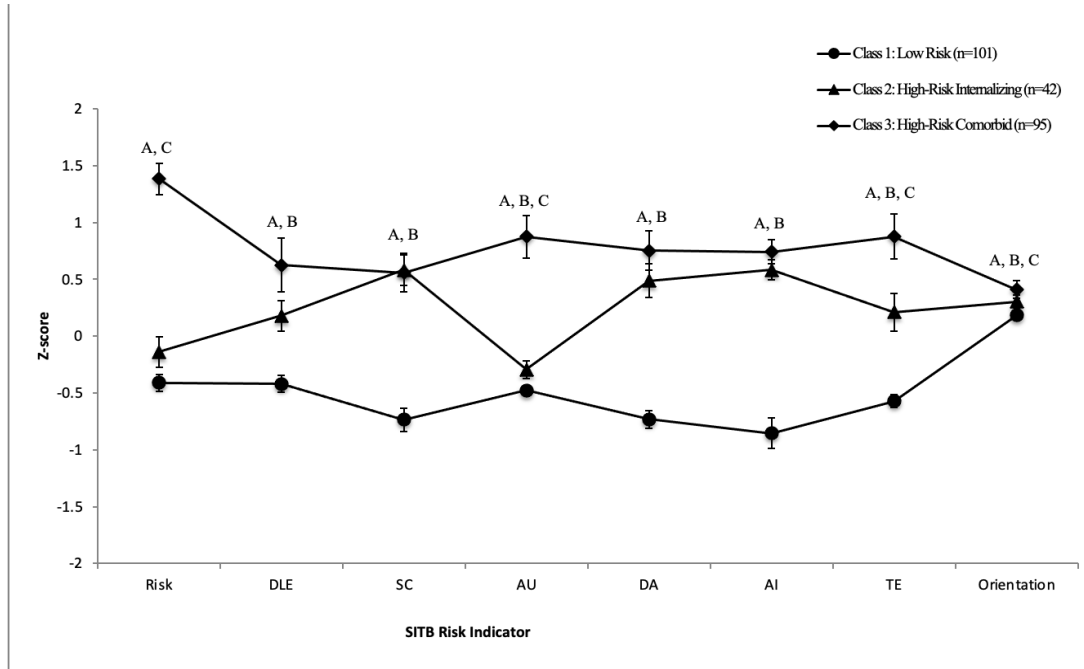
	Profile 1	Profile 2	Profile 3	Statistic
Thought about attempting (M/SD)	<sup>A</sup> -.27/.47	<sup>B</sup> .23/1.26	<sup>B</sup> .10/1.13	$X^2_{(2)} = 10.72$ *
Plan (M/SD)	<sup>A</sup> -.25/.38	<sup>B</sup> .35/1.42	<sup>B</sup> .12/1.17	$X^2_{(2)} = 12.28$ *
Attempts (M/SD)	<sup>A</sup> -.22/.41	<sup>B</sup> .32/1.43	<sup>B</sup> .07/1.14	$F_{(2,228)} = 5.20$ *
Wish you were dead (M/SD)	<sup>A</sup> -.31/.55	<sup>B</sup> .33/1.25	<sup>B</sup> .23/1.18	$X^2_{(2)} = 18.50$ **
Thought life not worth living (M/SD)	<sup>A</sup> -.32/.69	<sup>B</sup> .21/1.12	<sup>B</sup> .29/1.14	$X^2_{(2)} = 19.61$ **
Thought about hurting self (M/SD)	<sup>A</sup> -.33/.42	<sup>B</sup> .03/1.05	<sup>B</sup> .26/1.23	$X^2_{(2)} = 17.83$ **
Hopelessness (M/SD)	<sup>A</sup> -.24/.71	<sup>B</sup> .34/1.25	<sup>A,B</sup> .07/1.07	$X^2_{(2)} = 11.36$ *

Note. Superscript letter denotes significant differences across the profiles for a given variable or category. Significant one-way ANOVAs were followed up with post-hoc comparisons using a Games-Howell correction to evaluate pairwise comparisons. Significant chi-square analyses were assessed using z-tests to compare column proportions and adjusted using Bonferroni correction. \* $p < .01$ , \*\* $p < .001$ .

## Appendix B

### FIGURES

Figure 1. Justice-Involved Female Youth Classified Based on Indicators of Risk for SITBs.



Note. DLE = Daily Life Experiences; SC = Somatic Complaints; AU = Alcohol Use; DA = Depression and Anxiety; AI = Anger/Irritability; TE =Trauma Exposure. Letters above the mean denote group differences in risk indicators assessed using a one-way ANOVA with Bonferroni correction. A = Means associated with Profile 1 versus Profile 2 are significantly different; B = Means associated with Profile 1 versus Profile 3 are significantly different; C = Means associated with Profile 2 versus Profile 3 are significantly different.

## Appendix C

### IRB/HUMAN SUBJECTS APPROVAL



University Committee on Activities Involving Human Subjects  
665 Broadway, Suite 804  
New York, NY 10012  
Telephone: 212-998-4808  
Fax: 212-995-4304  
Internet: [www.nyu.edu/ucaihhs](http://www.nyu.edu/ucaihhs)

#### Full Board

IRB APPROVAL NOTICE:  INITIAL or  CONTINUING

**TO:** Shabnam Javdani  
**IRB NUMBER\*:** FY2016-35  
**STUDY:** The Roses RCT (Reducing Crime for Girls in the Juvenile Justice System through Researcher-Practitioner Partnerships)  
**SPONSOR:** NIJ  
**NUMBER OF SUBJECTS APPROVED FOR ENROLLMENT:** 400

Dear Investigator,

In accordance with 45 CFR 46.111, The University Committee on Activities Involving Human Subjects (UCAIHS) reviewed your revised research at its convened meeting of December 1, 2015, and further modifications requested by the Committee were reviewed by expedited review and approved. This study is to be returned to the Full Board at the time of continuing review.

**Approval Date:** 12-28-2015

**Expiration Date:** 11-30-2016

**Continuing Review application due date (approximately 30 days prior to expiration date): 10-29-2016**

#### Specific Conditions of Approval

Under 45 CFR 46.116(d) and 45 CFR 46.408(c), the IRB has approved your request for waiver of parental permission. This waiver is granted solely at the time the girls in detention are referred to the study, and receive an "Assent for referral form" with a stamped-addressed envelope to the research team. This form is only for their providing to the researcher their contact information after their release, and not for assenting to participate in the study. Once recruiting begins, parental permission, consent, and assent will be obtained before any subject is enrolled in this study.

Approval by the IRB does not guarantee access to any particular site, individual or data. It is your responsibility as principal investigator to make the appropriate contacts and to obtain written permission(s) from any cooperating institutions and the consent of study subjects before conducting your research. Copies of cooperating institution letters are to be filed with the IRB Office prior to initiating research at cooperating institution sites. Failure to do so may

result in the suspension of your research. Participation in this research must be strictly voluntary.

You must conduct your research in accordance with the IRB-approved protocol. You are responsible for obtaining and documenting effective informed consent using **only** the current IRB-approved stamped documents. An amendment must be submitted and approved prior to making any changes to your research. Please see additional investigator responsibilities in the attached pages.

Please note that the IRB has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process. We wish you the best as you conduct your research. If you have any questions or need further help, please contact the IRB office at 212-998-4808 or e-mail [ask.humansubjects@nyu.edu](mailto:ask.humansubjects@nyu.edu).

Sincerely,

Martin Cohen, MD (ret.)  
Chair  
University Committee on Activities Involving Human Subjects

\*Please reference **the IRB number listed above** on any documents or correspondence with the IRB concerning this research.