

7-1-2019

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Lindsey Wylie

*University of Nebraska at Omaha, slwylie@unomaha.edu*

Samantha S. Clinkinbeard

*University of Nebraska at Omaha, sclinkinbeard@unomaha.edu*

Anne M. Hobbs

*University of Nebraska at Omaha, ahobbs@unomaha.edu*

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### Recommended Citation

Wylie, L.E., Clinkinbeard, S.S., & Hobbs, A. (2019, July 1). The application of risk-needs programming in a juvenil diversion program. *Criminal Justice and Behavior*, 46(8), 1128-1147. <https://doi.org/10.1177/009385481985>

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# The Application of Risk–Needs Programming in a Juvenile Diversion Program

Lindsey E. Wylie, Samantha S. Clinkinbeard, & Anne Hobbs

University of Nebraska Omaha

<https://doi.org/10.1177/0093854819859045>

As “gatekeepers” into the juvenile justice system, diversion programs are positioned to prevent future delinquency. Although research on the effectiveness of diversion is mixed, the risk–needs–responsivity (RNR) model may explain how diversion programming that matches youth to services based on their risk and needs may reduce reoffending. Most RNR research has included juveniles at the deeper end of the system, fewer studies have examined RNR with early system–involved youth. The current study explored the application of risk and needs matching in a juvenile diversion program by gender and race/ethnicity. Furthermore, we estimated a survival function to estimate risk and needs alignment on time to recidivism. Although there were no gender differences in the application of RNR, some racial/ethnic differences did emerge. Findings provide support for assessing diversion youth with the Youth Level of Service/Case Management Inventory (YLS/CMI) and applying the RNR framework to early system–involved youth assessed as low to moderate risk.

## **Keywords:**

juvenile diversion; risk–needs–responsivity model; risk and needs assessment; recidivism; juveniles

The juvenile justice system in the United States has dual goals of protecting the public and rehabilitating juvenile offenders, which stimulates competing viewpoints on how best to handle juveniles who commit minor offenses. One approach offered to reduce the threat of juvenile crime and offset any unintended consequences of being formally processed through juvenile court is juvenile diversion (Beck, Ramsey, Lipps, & Travis, 2006). Although juvenile diversion programs aim to connect youth to services while reducing recidivism (Beck et al., 2006; Lundman, 1976; Office of Juvenile Justice and Delinquency Prevention [OJJDP], 2017), research on whether juvenile diversion reduces recidivism has been mixed, with some finding reduced recidivism rates compared with not-diverted youth (Wilson & Hoge, 2013) and others finding no difference (Patrick & Marsh, 2005; Schwalbe, Gearing, MacKenzie, Brewer, & Ibrahim,

2012). Of course, the quality of diversion programming likely affects recidivism rates. For instance, whereas some programs utilize a “one-size-fits-all” approach to creating diversion plans (i.e., based on their offense), others implement diversion plans that address a juvenile’s specific risk and needs following the risk–needs–responsivity (RNR) approach (Andrews, Bonta, & Hoge, 1990).

### **RNR Model**

Rather than relying on punitive “get tough” approaches that do little to reduce recidivism, the RNR model (Andrews, Bonta, & Hoge, 1990) is a rehabilitative framework that centers on three principles: the risk principle—the intensity and duration of services should increase as risk level increases, the need principle—criminogenic needs should be the target of programming, and the responsivity principle—services are delivered in a way that accounts for the individual’s characteristics or circumstances (Andrews & Bonta, 2006). General responsivity addresses the influence of specific services and whether interventions focus on behavioral and social learning practices, skill enhancement, and cognitive change (Andrews, Bonta, & Hoge, 1990; Dowden & Andrews, 1999). Specific responsivity involves individualizing treatment according to characteristics of the individual, including strengths, ability, motivation, personality, and demographic characteristics (Andrews & Bonta, 2010). Although developed as a model of evidence-informed service delivery within adult corrections, the RNR model has been extended to juvenile justice settings. The principles of RNR complement existing juvenile research that prioritizes therapeutic approaches over punitive approaches (e.g., Lipsey, Howell, Kelly, Chapman, & Carver, 2010); however, there has been little discussion on whether the model should be modified to meet the unique risk and needs of juvenile offenders (Brogan, Haney-Caron, NeMoyer, & DeMatteo, 2015)—especially those who are early system involved.

### **Support for the RNR Framework**

The RNR framework was initially supported at the program level by Andrews, Zinger, et al. (1990) in their meta-analysis of studies that included both adult and juvenile samples. Specifically, they found that treatment programs adhering to RNR principles were significantly more likely to reduce recidivism for both adult and juvenile samples, compared with non-RNR-adhering services, criminal sanctions, and unspecified services (see also updated analysis by Andrews & Bonta, 2006). Although the meta-analysis included both adult and juvenile samples, most of the studies within Andrews, Zinger, et al. (1990) meta-analysis were adult samples; as such, the authors recommended that “the number of evaluative studies of correctional services should increase dramatically” within juvenile justice (p. 386).

In addition to testing the effect of program adherence to RNR on recidivism, researchers have also examined whether adhering to RNR principles reduces recidivism at the individual level, including youth who are court-involved (e.g., Vieira, Skilling, & Peterson-Badali, 2009; Vitopoulos, Peterson-Badali, & Skilling, 2012), on

probation (e.g., Luong & Wormith, 2011; Vieira et al., 2009), or in a residential correctional facility (e.g., Singh et al., 2014). For instance, Vieira and colleagues (2009) evaluated the files of 122 court-assessed youth to determine whether clinical recommendations and referral to services were congruent for risk, needs, and responsivity, and whether congruency predicted recidivism. Although they were unable to match on risk, their findings indicated a 35% match rate for needs and 26% for responsivity. A survival analysis indicated that youth with lower match rates (0%-25%) had a higher and faster rate of recidivism than the other two groups, and that the medium (26%-74%) and high match (75%-100%) groups showed no difference in time to recidivism. Similarly, youth with less than 50% match on responsivity had a quicker time to reoffense than the higher matched group. When combining all three components into a model, both risk and needs match predicted time to recidivism; however, responsivity no longer contributed to the model.

### **Applicability of RNR by Gender and Race/Ethnicity**

As identified by Thompson and McGrath (2012), risk-needs assessments, and the application thereof, should be examined at the subgroup level because profiles likely vary by subgroups in meaningful ways that can be masked in aggregate analysis (Schwalbe, 2008; Thompson & McGrath, 2012). Furthermore, understanding subgroup risk profiles has implications for practices within juvenile justice, such as accounting for gender and race/ethnicity within interventions and services, and determining whether interventions and services are appropriate for the population (Thompson & McGrath, 2012).

With respect to gender, research has found differences at the item and domain levels of the Youth Level of Service/Case Management Inventory (YLS/CMI). Specifically, research indicates that males were more likely to have prior offenses and more likely to participate in leisure activities, but females were more likely to display tantrums or aggressive behavior and demonstrate high needs in the family and living circumstances domain (Thompson & McGrath, 2012). Despite differences at the item and domain levels, studies find little to no gender differences in the predictive validity of risk assessment tools (Dyck, 2016; Luong & Wormith, 2011; Schwalbe, 2008; see Viljoen, Cochrane, & Jonnson, 2018). In a meta analysis of juvenile justice risk assessment instruments, Schwalbe (2008) noted that any gender effects found in individual studies may be explained by biases in juvenile justice decision making, as opposed to actual observed gender differences. Although decision making biases could contribute to how the RNR principles are applied, research has generally found that programs have applied the RNR principles similarly for males and females. For instance, Vitopoulos and colleagues (2012) indicated that males and females had a similar number of criminogenic needs, and that these needs were met at similar rates. Furthermore, Singh and colleagues (2014) found that girls had a slightly higher match rate for needs than boys, but the difference was not statistically significant.

Similar to gender, research has demonstrated racial/ethnic differences at the item and domain levels of the YLS/CMI. Specifically, research has found that Black males scored higher on peer and education domains, but lower on the substance abuse domain as compared with White males, and White females scored higher than Black females on the substance abuse domain. Furthermore, the relationship between risk score and recidivism varied for Black and White youth, such that the YLS/CMI under classified the risk of Black males (Campbell, Papp, Barnes, Onifade, & Anderson, 2018). Studies have also tested whether RNR principles are adhered to equally across race/ethnicity, but to our knowledge, this research has been limited to Canadian samples of Indigenous and non-Indigenous youth (e.g., Lockwood, Peterson-Badali, & Schmidt, 2018; Luong & Wormith, 2011). For example, Lockwood and colleagues (2018) examined the role of risk, criminogenic needs, and recidivism between Indigenous youth and non-Indigenous youth on probation. Overall, there were no differences between Indigenous and non-Indigenous youth for the YLS/CMI, despite a previous study indicating higher risk scores for Indigenous youth (Luong & Wormith, 2011). Indigenous and non-Indigenous youth did not differ on the number of needs, or on the number of needs matched. When examining specific domains, fewer Indigenous youth were matched to services on the peer domain as compared with non-Indigenous youth.

### **RNR and Early System–Involved Juveniles**

Understanding whether the RNR framework is appropriate for early system–involved youth is important because diversion programs are often the first system point. To date, most research that has examined the impact of RNR at the individual level has been with youth in the deeper end of the system, including youth on probation (e.g., Vieira et al., 2009) and youth in correctional facilities (e.g., Singh et al., 2014). In one of the only studies on RNR that included Canadian youth on diversion, Dyck (2016) found that adherence to the three RNR principles was low, with most cases categorized as “partial adherence” (i.e., two of the four principles met). At the individual level, Dyck (2016) found differences by level of risk—namely, that the low-risk group had higher rates of risk principle adherence (88.9% met) than the medium- (58.8%) and high-risk groups (33.3%). For the needs principle, medium-risk youth had the highest proportion of needs met (37.8%), followed by high-risk youth (31.1%), and then low-risk youth (21.2%). In testing how matching to risk and needs predicted recidivism, the author estimated a survival analysis and found that the low and high adherence groups demonstrated no significant differences in time to reoffense; however, Dyck concluded that this may be because there was a larger proportion of higher risk youth in the low adherence group than the higher adherence group.

### **Current Study**

The current study examines the application of the RNR framework within a juvenile diversion program in a large Midwestern city. Under state guidelines, juvenile diversion programs “must match the risk and needs of the individual youth” and the

“diversion plan should be tailored to the needs of the individual youth” (Hoffman, 2015, p. 5). The juvenile diversion program in this study adheres by applying the RNR framework to the youth they serve. Each youth is assessed using validated assessment tools, and the diversion officer, in conjunction with the youth and family, develops a diversion plan. The diversion plan becomes a formal agreement with specified diversion requirements (e.g., curfew, letter of apology, classes, community service). Once the youth successfully completes the diversion program, the charges are not filed, and the youth is diverted from going to court.

First, we examined the YLS/CMI risk and needs profile of youth on diversion. Because diversion is offered to juveniles who are assessed as lower risk of reoffending, we expected that youth on diversion would present lower risk profiles than what has been reported in previous research for juveniles on probation or in detention (Singh et al., 2014; Vieira et al., 2009). Second, we tested the utility and predictive ability of the YLS/CMI on diversion outcomes, including successful completion and recidivism. We expected that juveniles with higher YLS/CMI scores would be less likely to successfully complete diversion and more likely to have future law violations than juveniles with lower YLS/CMI scores. Next, we explored gender or racial/ethnic differences in the risk-needs profile and application of RNR in diversion plans. Although few studies have found gender differences (Dyck, 2016; Luong & Wormith, 2011; Schwalbe, 2008; see Viljoen et al., 2018), studies with Canadian Indigenous youth have reported some racial/ethnic differences (Lockwood et al., 2018; Luong & Wormith, 2011). Finally, we tested whether alignment with the RNR risk and needs components was related to time to recidivism within 1 year of diversion discharge. Although we originally sought to evaluate the full RNR framework, we were unable to obtain valid data related to responsivity; as such, the current analysis only includes alignment to risk level and identified needs. We expected that youth who were in the served risk alignment group (equal number of services to domains identified as high risk) would be less likely to recidivate than the overserved or underserved groups. We also expected that those with a greater proportion of their needs met would be less likely to recidivate.

## **Method**

### *Participants and Data*

The full sample consisted of 2,482 juveniles referred to the juvenile diversion program between 2012 and 2015 in a large city in the Midwest. The initial database consisted of 3,394 youth admitted to the program; some cases were excluded because they were missing YLS/CMI scores ( $n = 179$ ) or they had less than 12 months of follow-up ( $n = 721$ ). We also excluded 12 cases that scored in the high-risk category on the YLS/CMI because they were outliers, and the small group makes comparisons difficult. Of youth referred to the program, 17.5% ( $n = 435$ ) were assessed and provided with warning letters only, 13.0% ( $n = 323$ ) were referred to services but unsuccessfully discharged, and 69.5% ( $n = 1,724$ ) were referred to services and successfully discharged. We included the youth who received a warning letter in the descriptive

analysis of the YLS/CMI, but excluded them from later analyses because they were not matched to services.

The final sample included 1,495 males (60.2%) and 987 females (39.8%), ranging from ages 7 to 18 years ( $M = 15.08$  years,  $SD = 1.57$  years). With respect to race/ethnicity, approximately 49% of the sample was White, 33% Black, 15% Hispanic/Latino, 1% Asian/Pacific Islander, 1% Native American or Alaskan Native, and <1% indicated Other or more than one race. The most common offenses were drug- or alcohol-related charges (30.9%, for example, minor in possession, possession of marijuana, possession of drug paraphernalia) and property-related offenses (39.5%, for example, shoplifting, theft, trespassing). Other types of charges included uncontrollable/disorderly conduct (11.9%), crimes against person (9.4%, for example, third-degree assault), traffic violations (2.7%, for example, leaving an accident, driving without a license), administrative (2.5%, for example, false reporting, obstructing an officer), vandalism (1.4%), weapons related (1.0%, for example, concealed weapon), truancy (<1%), and unspecified/unclear (<1%). Approximately 37.4% reported an annual family income of US\$40,000 or greater; 18.7% reported US\$25,000 to US\$39,999; 22.7% reported US\$10,000 to US\$24,999; 14.8% reported US\$0 to US\$9,999; and 6.4% did not report income. At the time of intake, 48.9% lived with two parents (including step-parents), 33.7% of the sample lived with mother only, 5.3% lived with father only, 2.5% lived equally between parents, 5.2% lived with another relative or nonrelative, less than 1% lived in a foster home or group home, and 3.8% did not specify.

**TABLE 1: YLS/CMI Scores by Gender**

Variables	Total sample ( $n = 2,482$ )		Female ( $n = 987$ )	Male ( $n = 1,495$ )	<i>p</i>	<i>d</i>
	<i>M</i> ( <i>SD</i> )	Range	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )		
YLS/CMI total	6.58 (4.26)	0-21	6.25 (4.00)	6.79 (4.41)	<.01	-0.13
Prior/current offense	0.01 (0.13)	0-2	0.02 (0.15)	0.01 (0.11)	.46	0.03
Family	0.77 (1.05)	0-6	0.79 (1.05)	0.76 (1.05)	.61	0.02
Education/employment	1.21 (1.24)	0-6	1.12 (1.26)	1.28 (1.23)	<.01	-0.13
Peers	1.76 (0.86)	0-4	1.74 (0.82)	1.77 (0.89)	.31	-0.04
Substance abuse	0.88 (1.20)	0-5	0.69 (1.09)	1.00 (1.26)	<.01	-0.26
Leisure/recreation	0.70 (0.88)	0-3	0.70 (0.87)	0.70 (0.88)	.93	0.00
Personality/behavior	0.98 (1.17)	0-7	0.97 (1.15)	0.98 (1.18)	.81	-0.01
Attitudes/orientation	0.26 (0.55)	0-3	0.24 (0.51)	0.28 (0.58)	.07	-0.07

*Note.* Includes youth who received a warning letter, but who did not enroll in diversion formally. YLS/CMI = Youth Level of Service/Case Management Inventory. Bold-faced values are statistically significant.

## Measures

**YLS/CMI.** All participants were assessed using the YLS/CMI 2.0 (Hoge & Andrews, 2011). The YLS/CMI is a standardized instrument that captures risk and needs according to eight domains: criminal history, family and parenting, current school

or employment, criminal peer affiliations, alcohol or drug problems, leisure and recreational activities, personality and behavior, and antisocial attitudes and orientation. The information is gathered from the youth and family and through collateral information (e.g., the school, other agencies). Each item on the 42-item checklist is coded absent or present (0 or 1), and items are combined to create low, medium, and high domain scores. In addition, a total risk score is calculated based on all items, and the juvenile is categorized as low risk (0-8), moderate risk (9-22), high risk (22-34), or very high risk (35-42) of reoffending. Scores ranged from 0 to 21 (M = 6.58, SD = 4.26) with approximately 74% of the sample identified as low risk (n = 1,839) and the remaining 26% identified as moderate risk (n = 643). Tables 1 to 4 display descriptive information for the YLS/CMI.

### *Risk Alignment*

The risk principle states that interventions should be linked to the level of risk, such that those assessing as higher risk should receive more treatment or supervision (e.g., Andrews, Bonta, & Hoge, 1990). To measure whether the diversion program created diversion plans in accordance to the juvenile's level of risk, we computed a risk alignment variable based on the total number of YLS/CMI domains scored as moderate risk or higher and the total number of services in the juvenile's diversion plan. Each participant was categorized as underserved (fewer services than the number of risk/need domains; 53.4%), served (equal numbers of services and risk/need domains; 25.4%), or overserved (more services than number of risk/need domains; 21.2%). In this sample, the total number of domains with at least moderate risk ranged from 0 to 7 (M = 3.46, SD = 1.51). Tables 5 and 6 include descriptive information on risk alignment.

**TABLE 2: YLS/CMI Scores by Race/Ethnicity**

Variables	White (n = 1,228)	Black (n = 816)	Hispanic (n = 363)	White vs. Black	White vs. Hispanic	Black vs. Hispanic
	M (SD)	M (SD)	M (SD)	p/d	p/d	p/d
YLS/CMI total	5.80 (3.91)	6.96 (4.28)	8.23 (4.75)	<.01/-0.28	<.01/-0.59	<.01/-0.29
Prior/current offense	0.02 (0.14)	0.01 (0.12)	0.02 (0.13)	<.01/0.02	1.0/-0.00	1.0/-0.03
Family	0.56 (0.90)	0.82 (1.04)	1.29 (1.25)	<.01/-0.27	<.01/-0.74	<.01/-0.43
Education/employment	0.86 (1.13)	1.58 (1.28)	1.58 (1.18)	<.01/-0.61	<.01/-0.63	1.0/0.00
Peers	1.73 (0.79)	1.74 (0.88)	1.86 (1.03)	1.0/-0.01	.05/-0.14	.11/-0.12
Substance abuse	1.07 (1.28)	0.57 (0.95)	0.90 (1.30)	<.01/0.44	.05/0.13	<.01/-0.32
Leisure/recreation	0.55 (0.82)	0.72 (0.87)	1.17 (0.92)	<.01/-0.20	<.01/-0.72	<.01/-0.50
Personality/behavior	0.80 (1.09)	1.16 (1.24)	1.17 (1.15)	<.01/-0.32	<.01/-0.34	1.0/-0.01
Attitudes/orientation	0.21 (0.51)	0.35 (0.62)	0.25 (0.55)	<.01/-0.26	.70/-0.08	.01/0.17

*Note.* Includes youth who received a warning letter, but who did not enroll in diversion formally. YLS/CMI = Youth Level of Service/Case Management Inventory. Bold-faced values are statistically significant.



**TABLE 3: YLS/CMI Scores by Discharge Reason**

Variables	Warning letter ( <i>n</i> = 435)	Successful discharge ( <i>n</i> = 1,724)	Unsuccessful discharge ( <i>n</i> = 323)	Warning vs. success	Warning vs. unsuccessful	Success vs. unsuccessful
	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>p/d</i>	<i>p/d</i>	<i>p/d</i>
YLS/CMI total	2.15 (1.12)	6.90 (3.73)	10.82 (4.34)	<b>&lt;.01/</b> -1.41	<b>&lt;.01/</b> -2.93	<b>&lt;.01/</b> -1.02
Prior/current offense	0.00 (0.05)	0.02 (0.13)	0.03 (0.17)	.11/-0.11	<b>.01/</b> -0.24	.12/-0.11
Family	0.16 (0.38)	0.78 (1.01)	1.54 (1.30)	<b>&lt;.01/</b> -0.67	<b>&lt;.01/</b> -1.54	<b>&lt;.01/</b> -0.71
Education/ employment	0.30 (0.58)	1.27 (1.21)	2.17 (1.27)	<b>&lt;.01/</b> -0.87	<b>&lt;.01/</b> -2.0	<b>&lt;.01/</b> -0.74
Peers	1.24 (0.84)	1.82 (0.81)	2.10 (0.88)	<b>&lt;.01/</b> -0.71	<b>&lt;.001/</b> -1.0	<b>&lt;.01/</b> -0.34
Substance abuse	0.10 (0.35)	0.97 (1.20)	1.41 (1.45)	<b>&lt;.01/</b> -0.81	<b>&lt;.01/</b> -1.34	<b>&lt;.01/</b> -0.35
Leisure/recreation	0.17 (0.43)	0.74 (0.88)	1.24 (0.94)	<b>&lt;.01/</b> -0.70	<b>&lt;.01/</b> -1.53	<b>&lt;.01/</b> -0.56
Personality/behavior	0.16 (0.40)	1.04 (1.15)	1.74 (1.30)	<b>&lt;.01/</b> -0.85	<b>&lt;.01/</b> -1.76	<b>&lt;.01/</b> -0.60
Attitudes/orientation	0.02 (0.14)	0.26 (0.54)	0.59 (0.77)	<b>&lt;.01/</b> -0.49	<b>&lt;.01/</b> -1.10	<b>&lt;.01/</b> -0.56

*Note.* Includes youth who received a warning letter, but who did not enroll in diversion formally. YLS/CMI = Youth Level of Service/Case Management Inventory. Bold-faced values are statistically significant.

### Needs Alignment

The needs principle indicates that dynamic needs, particularly criminogenic needs, should be the target of programming (e.g., Andrews, Bonta, & Hoge, 1990). In general, the highest demonstrated need in this sample was peers (77.0%), followed by education/employment (69.4%), personality/behavior (62.5%), substance abuse (52.3%), and leisure/recreation (49.7%). Fewer juveniles presented needs related to attitudes/orientation (25.2%) and family (9.5%). Overall, the data included approximately 70 different services and programs. Services were matched to criminogenic needs by diversion staff who are trained to administer the YLS/CMI. As such, the needs alignment proportion is not based on objective coding by the researchers, but rather based on the matching of needs to services by the program. The Supplemental Appendix (available in the online version of this article) displays

case services, grouped by types, and how they were matched by the diversion staff to each YLS/CMI domain. It should be noted that services were not consistently designated to specific domains because youth may be referred to a service for multiple needs, and diversion staff selected the most relevant domain for that youth. Furthermore, juveniles may be referred to services in an attempt to address different needs. For example, a juvenile may be referred to a mentoring program to address the peers domain, whereas another juvenile may be referred to a mentoring program to address the family domain.

**TABLE 4: YLS/CMI Scores by Recidivism**

Variables	Recidivated ( <i>n</i> = 453)	Did not recidivate ( <i>n</i> = 1,594)	OR	<i>p</i>	AUC
	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )			
YLS/CMI total	8.91 (4.44)	7.12 (3.89)	1.11	<b>&lt;.01</b>	.62
Prior/current offense	0.03 (0.17)	0.02 (0.13)	1.67	.13	.50
Family	1.09 (1.20)	0.85 (1.06)	1.21	<b>&lt;.01</b>	.56
Education/employment	1.75 (1.32)	1.31 (1.22)	1.31	<b>&lt;.01</b>	.60
Peers	2.00 (0.87)	1.83 (0.82)	1.28	<b>&lt;.01</b>	.54
Substance abuse	1.34 (1.35)	0.96 (1.21)	1.26	<b>&lt;.01</b>	.58
Leisure/recreation	0.90 (0.92)	0.79 (0.90)	1.14	<b>.02</b>	.53
Personality/behavior	1.36 (1.24)	1.10 (1.18)	1.19	<b>&lt;.01</b>	.56
Attitudes/orientation	0.45 (0.71)	0.27 (0.55)	1.55	<b>&lt;.01</b>	.56

Note. Youth who received a warning letter were excluded in the predictive analysis for recidivism. YLS/CMI = Youth Level of Service/Case Management Inventory; OR = odds ratio; AUC = area under the curve. Bold-faced values are statistically significant.

**TABLE 5: Risk Application and Alignment by Gender**

Variables	Overall ( <i>n</i> = 2,047)	Female ( <i>n</i> = 790)	Male ( <i>n</i> = 1,257)	<i>p</i>	<i>d</i>
	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )		
Number domains	3.46 (1.51)	3.37 (1.45)	3.51 (1.54)	<b>.04</b>	-0.09
Number services	2.85 (0.84)	2.80 (0.80)	2.88 (0.87)	.06	-0.09
Days in program	121.87 (53.42)	122.55 (52.03)	121.45 (54.28)	.65	0.02
	Frequency %	Frequency %	Frequency %	<i>p</i>	<i>d</i>
Risk alignment					
Underserved	53	52	54	.48	-0.03
Served	25	26	25	.58	0.03
Overserved	21	22	21	.78	0.01

Note. Excludes 435 youth who received a warning letter. Bold-faced values are statistically significant.

**TABLE 6: Risk Application and Alignment by Race/Ethnicity**

Variables	White ( <i>n</i> = 980)	Black ( <i>n</i> = 696)	Hispanic ( <i>n</i> = 308)	White vs. Black	White vs. Hispanic	Black vs. Hispanic
	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>p/d</i>	<i>p/d</i>	<i>p/d</i>
Number domains	3.20 (1.45)	3.55 (1.48)	3.99 (1.59)	<b>&lt;.01/-0.24</b>	<b>&lt;.01/-0.53</b>	<b>&lt;.01/-0.29</b>
Number services	2.87 (0.81)	2.77 (0.86)	2.97 (0.87)	.07/0.11	.18/-0.12	<b>&lt;.01/-0.23</b>
Days in program	114.92 (50.77)	131.69 (56.36)	120.37 (50.55)	<b>&lt;.01/-0.32</b>	.34/-0.11	<b>&lt;.01/0.21</b>
	Frequency	Frequency	Frequency	<i>p/d</i>	<i>p/d</i>	<i>p/d</i>
Risk alignment						
Underserved	45	59	66	<b>&lt;.01/-0.31</b>	<b>&lt;.01/-0.43</b>	<b>&lt;.01/-0.13</b>
Served	29	23	21	<b>.01/0.13</b>	<b>&lt;.01/0.18</b>	<b>&lt;.01/0.05</b>
Overserved	27	18	14	<b>&lt;.01/0.22</b>	<b>&lt;.01/0.31</b>	<b>&lt;.01/0.11</b>

Note. Excludes 435 youth that received a warning letter. Bold-faced values are statistically significant.

**TABLE 7: Risk Alignment and Recidivism**

Variables	Model 1		Model 1a	
	<i>B</i> (SE)	HR [95% CI]	<i>B</i> (SE)	HR [95% CI]
YLS/CMI	—	—	0.06 (0.01)**	1.06 [1.03, 1.09]
Risk align				
Underserved	0.33 (0.12)**	1.39 [1.09, 1.76]	0.12 (0.13)	1.12 [0.86, 1.46]
Overserved	-0.22 (0.16)	0.80 [0.58, 1.10]	-0.10 (0.17)	0.90 [0.65, 1.25]
Days program	0.00 (0.00)**	1.00 [1.00, 1.00]	0.00 (0.00)**	1.00 [1.00, 1.00]
Discharge	-0.49 (0.12)**	0.61 [0.49, 0.77]	-0.33 (0.12)**	0.72 [0.56, 0.91]
Age	0.10 (0.03)**	1.11 [1.04, 1.18]	0.11 (0.03)**	1.12 [1.04, 1.19]
Race/ethnicity				
Black	0.40 (0.11)**	1.49 [1.20, 1.84]	0.41 (0.11)**	1.50 [1.22, 1.86]
Hispanic	0.07 (0.15)	1.07 [0.81, 1.43]	-0.01 (0.15)	0.99 [0.74, 1.32]
Gender	-0.43 (0.10)**	0.65 [0.53, 0.80]	-0.41 (0.10)**	0.66 [0.54, 0.81]

Note. For discharge, the reference category is successful discharge = 1; and for gender, the reference category is female = 1; the omitted reference category for risk alignment is served (i.e., services equal to needs) and the omitted reference category for race/ethnicity is *White*. HR = hazard ratio; CI = confidence interval; YLS/CMI = Youth Level of Service/Case Management Inventory.

\* $p < .05$ . \*\* $p < .01$ .

We created two needs alignment variables. The first variable, referred match, was based on the services a juvenile was referred to (regardless of whether the youth completed the service), which indicates how well the program attempted to match needs to services. For example, if the juvenile demonstrated a need in the family domain and was referred to a service that was designated as meeting the family domain need, then it would be coded as a referral match (or being need aligned). The second variable, completed match, was based on whether the referred service was completed by the juvenile. Using the referred match and completed match variables, we calculated two needs alignment ratios by dividing the total number of domain matches (both referred and completed) by the total number of needs that were identified as being at least moderate by the YLS/CMI. Approximately 83% of youth were appropriately referred to at least one domain-specific service, whereas 68% of youth had a completed match (i.e., they completed at least one of their matched services). When we examined the effect of needs alignment on recidivism, we used the more stringent criteria (i.e., completed match ratio). Table 7 provides descriptive information about referral and completed matches for each domain.

### *Recidivism*

Recidivism was defined as any offense that was filed in court following discharge, excluding cases that were dropped or dismissed. Data were obtained from the state's trial court case management system and included all juvenile and adult misdemeanor and felony cases between July 1, 2012, and December 31, 2015. Adult records were included to calculate recidivism for juveniles who may have participated in diversion when they were almost 18 years old. Using probabilistic record linkage software, we matched youth in the sample to recidivism records using first name, middle name, last

name, and date of birth. We included any offenses that occurred within 12 months from the date of program discharge. Approximately 22% of the sample recidivated within 12 months, and the average number of days to recidivism was 164.12 days (SD = 103.29 days), with a range of 1 to 365 days to reoffense.

### *Demographics, Days in the Program, and Discharge Reason*

We included gender (0 = male, 1 = female), age as a continuous variable, and race coded as a series of dummy variables: White, Black, and Hispanic. Although we could not obtain valid information on the duration and intensity of each service, as a measure of program duration, we also included total number of days in the program, which ranged from 9 to 401 (M = 121.87 days, SD = 53.42 days). To control for program completion in predictive models, we included a binary variable to indicate whether the youth successfully completed the diversion program's requirements (successful discharge = 1) or whether the youth did not complete the program's requirements (unsuccessful discharge = 0).

### *Analytic Strategy*

Where appropriate, we employed analyses of variance (ANOVAs), t tests, and chi-square analyses to explore gender and racial/ethnic differences. We also calculated Cohen's d values to indicate effect size differences. It is important to note that the bivariate analyses cannot tell us whether there are other variables (e.g., poverty, family structure) that are confounded with gender or race; thus, these comparisons serve as descriptive information only. We utilized a survival analysis to examine recidivism across a 12-month follow-up period. Survival analysis allows for the incorporation of time-to-event into the model and can estimate one's probability of surviving beyond a specified time. Survival curves were plotted to illustrate recidivism according to risk-alignment category. Cox regressions were utilized to estimate the effects of risk and needs alignment on a youth's hazard for recidivism, controlling for days in the program, discharge reason, age, gender, and race/ethnicity. All analyses were conducted using STATA, version 14.2.

## **Results**

### *YLS/CMI Descriptives*

First, we present descriptive information on the YLS/CMI. Table 1 displays the overall and domain-specific YLS/CMI scores for the entire sample, followed by mean comparisons by gender. Males scored significantly higher than females on the overall YLS/CMI and the education/employment and substance abuse domains. Effect sizes indicate that the differences were relatively small with the largest difference in substance abuse. Mean comparisons by race/ethnicity are presented in Table 2. White youth had the lowest YLS/CMI scores and Hispanic youth had the highest. A similar pattern emerged for the family and leisure/recreation domains, such that Hispanic youth had the highest risk scores followed by Black and then White youth. White youth scored

significantly lower than both Black and Hispanic youth on the education and personality/behavior domains. Black youth scored higher on the attitudes/orientation domain and lower on the substance abuse domain than both White and Hispanic youth. Effects sizes ranged from small to medium with the largest differences occurring between White and Hispanic youth on family, education/employment, and leisure/recreation.

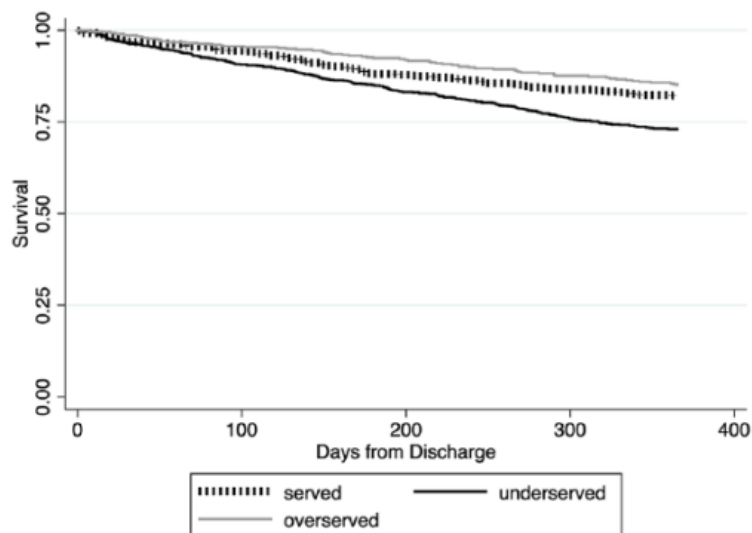
Table 3 provides the YLS/CMI descriptives by discharge reason (i.e., warning letter, successful discharge, unsuccessful discharge). One-way ANOVAs revealed significant YLS/CMI differences by discharge reason for the YLS/CMI total and each of the YLS/CMI domains. Overall, youth who were unsuccessfully discharged had the highest YLS/CMI scores, followed by those who were successfully discharged. Juveniles who received a warning letter had the lowest scores, which is expected because the decision to give a warning letter is based on the YLS/CMI scores. Effect sizes ranged from moderate to large, with the greatest difference between youth who received a warning letter and those who were unsuccessfully discharged. Youth who recidivated had higher YLS/CMI total scores and scored higher on all domains (excluding offense) than those who did not recidivate (Table 4). The area under the curve (AUC) was calculated for each domain and although several were above .50 (i.e., chance), they were only slightly above, indicating that the YLS/CMI alone, without consideration of additional factors, has modest predictive validity for this sample. The AUC for the overall score was .62.

### *Risk and Needs Application*

With respect to risk alignment, we first compared whether there were any gender or racial/ethnic differences for the number of domains with an identified risk, the number of services within the diversion plan, and the number of days in the program (upper half of Tables 5 and 6). Males had a significantly higher average number of domains with an identified risk than females, but males and females did not differ regarding the number of services assigned or the number of days in the program. Some racial/ethnic differences did emerge (Table 6). Hispanic youth had the largest number of moderate/high risk domains, followed by Black, and then White youth. Furthermore, Hispanic youth had significantly more services than Black youth. Days in the program was also significant by race, with post hoc analysis indicating that Black youth were in the program for significantly more days than White and Hispanic youth.

Next, we examined differences in risk alignment by gender and race/ethnicity. Results revealed that there were no differences by gender for any of the risk alignment categories; specifically, males and females were underserved, served, or overserved at approximately the same rates (Table 5, lower half). For race/ethnicity (Table 6, lower half), Hispanic youth were the most likely to be underserved, followed by Black and White youth. White youth were more likely than the other groups to be served or overserved, and Hispanic youth were least likely to be served/overserved, though most of the effect sizes were relatively small.

We examined needs alignment both as referred and completed for each of the domains. The domain with the highest match was substance abuse (84% referred, 65% completed), followed by personality/behavior (77% referred, 59% completed); there were fewer matches for attitudes (25% referred, 18% completed), peers (16% referred, 13% completed), family (14% referred, 8% completed), education (11% referred, 7% completed), and leisure (6% referred, 4% completed). Overall needs alignment was calculated by dividing the total number of needs by the number of matches. The average match rate was approximately 36% for referrals and 29% for completions. Referrals to matched domain needs were made at the same rate for males and females, though females had a slightly higher completion match rate compared with males. White youth had higher referral and completed match rates than both Black and Hispanic youth (detailed comparisons by gender and race/ethnicity can be found in Supplemental Tables S1 and S2, available in the online version of this article).



**Figure 1: Kaplan–Meier Survival Curves for Risk Alignment**

*Note.* This figure illustrates the survival function for the three risk alignment groups: underserved (i.e., fewer services than areas of risk), served (equal services and risk areas), and overserved (more services than areas of risk).

### *Risk Alignment and Recidivism*

As mentioned above, risk alignment was assessed by determining the degree to which the number of services matched the number of risk/need domains (with moderate or high risk). Figure 1 displays the differences in rates of survival across 12 months according to the risk alignment category, not controlling for other predictors. Specifically, those who were underserved recidivated more quickly and had the lowest rate of survival at 12 months, whereas those who were overserved (i.e., received more services than identified risk domains) had the highest rate of survival by the end of 12 months. Approximately 27% of those in the underserved category had recidivated by 12

months, compared with 15% and 18% in the overserved and served groups, respectively. Log-rank tests for equality of the survivor function confirmed that the functions were different between the groups,  $\chi^2(2, N = 2,045) = 33.17, p < .001$ . Pairwise comparisons indicated that underserved youth were significantly different from both served and overserved youth; however, the latter two categories did not differ significantly from each other.

A Cox regression analysis was conducted to examine the relationship between risk alignment and recidivism across 12 months, controlling for time in the program, discharge status, race/ethnicity, gender, and age. As indicated in Model 1 of Table 7, those who were underserved had significantly greater hazard of reoffense during the follow-up than those in the served group. The model indicates that the rate of recidivism for those who received fewer services than needed is 39% higher than those who received the appropriate number of services to number of risk domains. Those who received more services than risk domains (overserved) were not significantly different from the reference category. Males and Black youth had significantly greater hazard of reoffense (or at least more contact with the justice system) when compared with females and White youth. A 1-year increase in age was associated with an 11% increase in reoffense hazard. Days in the program was positively related to reoffense though the practical significance is questionable. Finally, youth who were successfully discharged were less likely to reoffend. The model indicates that the hazard for those who completed the program was 39% lower than those who did not complete the program. When the YLS/CMI total score is added to Model 1a (Table 7), it is significant, but the effect of being underserved is no longer significant, suggesting total risk is more important than risk alignment, as operationalized here. Specifically, a 1-point increase in YLS scores was associated with a 6% increase in hazard rate of recidivism. Days in the program, successful discharge, age, Black, and female remain significant.

### *Needs Alignment and Recidivism*

Needs alignment was assessed by determining the degree to which youth completed services that matched the domain area of their identified needs. We examined the proportion of service matches to all YLS/CMI identified needs (i.e., total number of completed matches/total number of needs) as a linear predictor of survival. On average, youth had completed service-domain matches on approximately 29% of their needs. Cox regression analyses were conducted to examine the relationship between needs alignment and recidivism across 12 months, controlling for time in the program, discharge status, race/ethnicity, gender, and age.

The results of these analyses can be found in Model 2 and Model 2a of Table 8. The needs alignment proportion variable was not a significant predictor in either model. We ran the same model with the referred version of the needs alignment ratio, which was also not significant. Total YLS/CMI risk scores, days in the program, discharge status, age, Black, and female were all significant predictors of recidivism across 12 months. Each 1-point increase in YLS/CMI risk score was associated with a 7%



increase in reoffense hazard. Males and Black youth had a greater hazard (33% and 50%, respectively) of official contact with the justice system in the 12 months following discharge, and youth who successfully completed the program had 29% lower hazard of recidivism compared with those who did not complete the program.

## Discussion

The RNR approach for assessing and treating those in the juvenile and criminal justice systems was a response, in part, to the recognition that retribution and punitive responses failed to reduce recidivism, and the better approach is to implement individualized treatment (Andrews & Bonta, 2010). Previous work with the RNR model has mostly examined this framework for adult offenders and deeper system-involved juvenile offenders, such as youth on probation (e.g., Vieira et al., 2009) or in correctional facilities (e.g., Singh et al., 2014). This study examined how the RNR framework is applied in a juvenile diversion program and whether the application is predictive of recidivism for early system-involved youth. In general, previous research on juvenile diversion programs has reported mixed findings for whether juvenile diversion programs are reducing recidivism (Patrick & Marsh, 2005; Schwalbe et al., 2012; Wilson & Hoge, 2013). Perhaps it is not necessarily whether diversion programs in general “work” for reducing recidivism, but rather what works is whether the program is connecting those youth to the services they need through an individualized juvenile diversion plan.

**TABLE 8: Needs Alignment and Recidivism**

Variables	Model 2		Model 2a	
	<i>B</i> ( <i>SE</i> )	HR [95% CI]	<i>B</i> ( <i>SE</i> )	HR [95% CI]
YLS/CMI	—	—	0.07 (0.01)**	1.07 [1.05, 1.10]
Needs alignment	0.01 (0.21)	1.01 [0.67, 1.53]	0.02 (0.22)	1.07 [0.66, 1.58]
Days program	0.00 (0.00)**	1.00 [1.00, 1.00]	0.00 (0.00)*	1.00 [1.00, 1.00]
Discharge	−0.57 (0.13)**	0.56 [0.44, 0.72]	−0.34 (0.14)*	0.71 [0.55, 0.93]
Age	0.09 (0.03)**	1.10 [1.03, 1.17]	0.11 (0.03)**	1.11 [1.04, 1.19]
Race/ethnicity				
Black	0.42 (0.11)**	1.53 [1.23, 1.89]	0.41 (0.11)**	1.50 [1.21, 1.86]
Hispanic	0.13 (0.15)	1.14 [0.85, 1.52]	−0.03 (0.15)	0.98 [0.73, 1.30]
Gender	−0.43 (0.11)**	0.65 [0.53, 0.80]	−0.40 (0.11)**	0.67 [0.54, 0.82]

*Note.* For discharge, the reference category is successful discharge = 1; and for gender, the reference category is female = 1; the omitted reference category for race/ethnicity is *White*; needs align represents the ratio of completed domain matches over total identified needs. HR = hazard ratio; CI = confidence interval; YLS/CMI = Youth Level of Service/Case Management Inventory.

\* $p < .05$ . \*\* $p < .01$ .

### *Risk–Needs Profile of Diversion Youth*

First, we explored the YLS/CMI profiles of youth on diversion, including differences by gender and race/ethnicity. Overall, the areas assessed as highest risk were the peers and the education/employment domains, and the areas of lowest risk



were the attitudes/orientation and prior/current offense domains. Our findings are similar to those from previous research with court-involved youth, which found the most commonly identified need was education, and the least common was attitudes/orientation (Lockwood et al., 2018; Vieira et al., 2009). In general, research has found that females exhibit lower risk levels on the YLS/CMI than males (Onifade et al., 2008); however, studies have indicated that females on probation assess as higher risk than males (Vitopoulos et al., 2012). In the current sample, males scored significantly higher than females on the total YLS/CMI. Males were also assessed as higher risk than females on the substance abuse and education/employment domains. Research also finds that non-White youth often assess as higher risk than White youth (Luong & Wormith, 2011; Onifade et al., 2008), though this trend is not always demonstrated (Lockwood et al., 2018). For juveniles in this sample, White youth were assessed at lowest risk, followed by Black youth, and then Hispanic youth. With respect to individual domains, a similar pattern emerged for the family and the leisure/recreation domains. Substance abuse was the only domain that White youth were assessed as higher risk than Black youth, but not for Hispanic youth.

#### *Validity of the YLS/CMI for Diversion Youth*

In validation of the YLS/CMI as an assessment tool for use in juvenile diversion programs, scores were associated with both discharge and recidivism. Those who successfully completed the program had the lowest scores, whereas youth who were referred to services but did not successfully complete the program had the highest risk scores. Also, as expected, youth who recidivated during the 12 months after discharge (successfully or unsuccessfully) had higher initial risk scores than those who did not recidivate. The AUC calculation for each domain and the overall score demonstrated modest predictive validity for this sample, similar to values reported by others (Campbell et al., 2014; Chu, Yu, Lee, & Zeng, 2014; Schwalbe, 2007).

#### *Application of Risk–Needs Principles*

We also explored the application of the risk and needs principles by gender and race/ethnicity. With respect to risk, there was no evidence of gender differences for the number of services, days in the program, or the proportion of youth with appropriate risk alignment (i.e., number of services), similar to trends found in previous research (Vitopoulos et al., 2012). Males had a higher number of identified risk domains than females; and, there were some differences by race/ethnicity. With respect to the number of domains with an identified need, Hispanic youth had the highest number of risk/need domains, followed by Black youth, and then White youth. Black youth received slightly fewer services than Hispanic youth, yet spent more time in the program than either White or Hispanic youth. Juveniles may spend longer in the program due to the types of services they are referred, and also the time it takes for them to complete the diversion plan. In this program, a completion date is set, but the juvenile may get an extension to complete his or her diversion requirements. It is not clear why there would be differences by race/ethnicity for time in the program but is something programs should

be aware of because it could affect completion rates. In terms of risk alignment, White youth were less likely than either Black or Hispanic youth to be underserved (i.e., fewer services than needs), and also more likely than Hispanic or Black youth to be served (i.e., equal services and needs) or overserved (i.e., more services than needs).

Overall, youth in this diversion program had approximately 36% of their needs referred to a service in a matching domain. That said, when we accounted for service completion, the match to needs rate dropped to 29%. Females had a significantly higher completed match rate than males. White youth had the highest proportion of their needs referred to services, followed by Black, and Hispanic youth. The same pattern existed for completion matches. Although these rates may seem low, the needs match rates were relatively similar to the match rates that Vieira and colleagues (2009) identified in their examination of individual-level RNR in probation youth (i.e., 35% needs match rate).

The domains with the most successful content matches were substance abuse and personality/behavior, whereas the fewest need matches were achieved in the leisure/recreation and education/employment domains. There could, of course, be several reasons for not matching youth to services 100% of the time. There may be practical concerns, such that some domains are easier to match with services than other domains. With substance abuse needs, it may be that matching youth to services that address substance use (i.e., substance use assessment, treatment, or other didactic classes) is a more straightforward process because services are often designed to directly affect substance abuse issues. With respect to education/employment, this diversion program referred youth to tutoring services or attendance programs; however, beyond monitoring attendance and grades, there may not be many services that address these needs, making matching to services more challenging. Furthermore, some of the behavioral components of the education/employment domain (i.e., disruptive class behavior, problems with peers or teachers) may get addressed through services that were not necessarily attached to education/employment (e.g., mental health services). One limitation of the data is that each service could only be linked to a single YLS/CMI domain, and as such, there could be an underestimation of match when a single service was selected to address more than one need.

Other reasons for low needs alignment may include not having certain services available in the geographical area. Although the diversion program in this study was in a large Midwestern city, with more than 70 services available to the youth in the sample, there may still be gaps in services. Furthermore, lower match rates may be due to youth/families refusing services. Because the diversion plans in this program are developed in conjunction with the youth/families, there are opportunities for the juvenile or the family to express apprehension over certain requirements (i.e., the service is too far to drive to, or refusal of mental health counseling). As such, to no fault of the program, a juvenile may have a domain demonstrating high needs that may ultimately not be matched to a service because of refusal.

### *Risk–Needs Alignment and Recidivism*

Although underserved youth were significantly more likely to recidivate during the 12-month follow-up than served youth, the significance did not hold once overall YLS/CMI scores (i.e., risk level) were accounted for in the model. To some extent, this makes sense because underserved youth were also those with the highest initial risk scores. These results could indicate that for early system–involved juveniles, it may be better to err on overserving than underserving as long as the services are based on need, especially for those with higher initial risk. Although there is reluctance to overserve youth because having too many requirements may result in diversion failure and net widening, if those services are tailored to the needs of the youth and not based on punitive or retributive reasons, this may be better than referring youth to fewer services just because they are lower risk. We recommend a diversion model where services are offered based on risk and needs, but that the juvenile is not required to necessarily complete those services as a condition of their charges being dismissed (i.e., voluntary services).

Needs alignment, as captured by a ratio of total completed matches over total needs, was not significantly associated with recidivism in the regression models. Youth who were male, Black, and older were more likely to have official contact with the justice system during the 12 months following discharge from the program. Furthermore, successful discharge was associated with less time to recidivism. Thus, even though individual components of the RNR alignment did not hold significance once risk was accounted for, successful completion of the program, guided by RNR philosophy, did have a positive impact on hazard rates. Future research might consider comparing multiple diversion programs to see whether those that are informed by the RNR framework are more effective than those that take a different approach.

### *Limitations*

These results should be considered in light of a few limitations. First, data were obtained from the juvenile diversion program for secondary data analysis and coding/operationalization of the variables may not have been optimal compared with collecting the data ourselves. When computing the needs match variable, for instance, we relied on the designation the diversion officer made for the YLS/CMI domain that was connected to the referral service. Although on one hand, this allowed us to test how the program was adhering to RNR principles, it does not allow for an independent examination of adherence to RNR principles (i.e., is the program accurately matching needs to services?). In a similar vein, the data obtained spanned several years, with a number of diversion officers likely assessing youth and creating diversion plans based on that assessment. Although program staff are trained in this area, ultimately, there may be differences between diversion officers in how they interpret risk/needs/responsivity and matching. For instance, whereas one diversion officer might refer a youth to mentoring under the family domain, another may refer to mentoring under the attitudes/orientation domain.

The RNR framework also poses some practical limitations for assessing matching of risk and needs to services using archival data and certain data analysis techniques. Although it makes a cleaner research design to have each service match to a single domain (e.g., mentoring = family/parenting), in practice, some services likely address more than one domain, making the matching operationalization somewhat restricted. When this happens, diversion officers select the domain they feel it most addresses, and as such, we miss the domain matches that are secondary. Thus, the extent of need match may actually be underestimated. Furthermore, because all the measures of alignment in our study were created based on YLS scores and domains, there may be some overlap in the variance being accounted for by our measures, especially for those models that controlled for the overall YLS risk score.

The generalizability of the findings may be limited because of the sample. Juvenile diversion is optional, and youth/families may decide to take their case through traditional juvenile court and not go through the assessment/intake process. The types of youth who choose to go to court may exhibit different characteristics in terms of need than youth who choose diversion. Moreover, any racial/ethnic differences may be due to overarching issues related to disproportionate minority contact/racial and ethnic disparities because the number of non-White juveniles in the sample overrepresents the population. Although this may affect who enters diversion, it also likely affects who chooses to take diversion, and outcomes such as recidivism.

It is important to note that our risk alignment variable cannot speak directly to service intensity or quality. It does offer an operationalization that follows the view of the risk principle, that youth who are assessed as higher risk should receive more services, whereas youth who are lower risk should receive fewer services (i.e., a proxy measure for level of supervision). That said, adherence to the risk principle could also be achieved by referring a high-risk youth with several high-risk domains to one multifaceted, high-dosage intervention as opposed to multiple low-dosage interventions. Because this is one of the few attempts in the literature to operationalize risk alignment, future research should find ways to incorporate both quantity and intensity into measures of risk alignment. Furthermore, we recommend that diversion programs track not only the number and content area of services but also some measure of intensity or dosage. Such ratings could help officials account for risk in their referral processes.

Also, in this study, we were unable to fully examine the RNR framework because we did not have reliable data for incorporating the responsivity variable. Responsivity is empirically supported component of rehabilitation; however, responsivity is often poorly operationalized compared with the risk and needs component (see Kennedy, 2000). To measure responsivity, researchers have developed a host of proxy measures that have included factors about the person (e.g., treatment readiness, treatment performance, mental health factors, cognitive functioning, language), factors about the therapist or program, and even factors related to the type of service (e.g., behavioral or cognitive programming). For this study, the data did not allow us to code for either specific or

general responsivity. One explanation for this may be that responsivity is best measured in ways that are not available by examining secondary data. Future research may explore the responsivity construct using primary data collection, including direct measure of treatment readiness and motivation from offenders, examining the therapeutic relationship between the offender and the program staff/therapist, or do in-depth analysis with each service youth are referred to capture behavioral or cognitive components.

## **Conclusion**

The juvenile justice system's response to juvenile offenders has fluctuated between rehabilitative approaches and more punitive, retributive responses. These responses may be influenced by current events, such as an egregious crime in the community; the setting (i.e., school, law enforcement agency, office of county/district attorney); the community's philosophical approach to addressing juvenile crime; budgetary concerns; or even parents who still believe that a more punitive approach will dissuade the youth from future offending. When considering risk and needs alignment in this study, initial risk ultimately washed out any individual contributions of these practices. That said, the diversion program in the current study, which attempts to follow the RNR model, was successful in the sense that those who completed their risk-needs informed plan were less likely to recidivate than those who did not complete their plan, even when accounting for initial risk. Future research would benefit from a continuing to explore different ways of measuring needs and risk alignment to better understand how the components of RNR may contribute to the success of the whole for lower risk offenders.

## **Supplemental Material**

Supplemental Appendix and Supplemental Tables S1 and S2 are available in the online version of this article at

<http://journals.sagepub.com/home/cjb>.

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**Lindsey E. Wylie**, JD, PhD, is the director of research of the Juvenile Justice Institute at the University of Nebraska at Omaha. Her research interests include attributional biases and the (un)intended consequences of legal system involvement across the lifespan (juveniles and older adults).

**Samantha S. Clinkinbeard**, PhD, is an associate professor in the School of Criminology and Criminal Justice at the University of Nebraska Omaha. Her research interests include delinquency and substance abuse, motivation and self-concept, life course transitions, and women in policing.

**Anne Hobbs**, JD, PhD is a licensed attorney, and director of the Juvenile Justice Institute at the University of Nebraska at Omaha. Her research interests include measuring effective interventions, disproportionate minority contact, re-entry after incarceration, and mentoring youth who have been involved in the juvenile justice system.

**Authors' Note:** The authors would like to thank Shawne Coonfare and Yosef Seigel. This research was supported, in part, by the Nebraska Community-Based Aid Fund Evaluation Project. Correspondence concerning this article should be addressed to Lindsey Wylie, Juvenile Justice Institute, School of Criminology and Criminal Justice, University of Nebraska Omaha, 941 O Street, Suite 706, Lincoln, NE 68508; e-mail: slwylie@unomaha.edu.