

THE RELATIONSHIP BETWEEN MATCHING SERVICE TO CRIMINOGENIC NEED AND RECIDIVISM IN MALE AND FEMALE YOUTH

Examining the RNR Principles in Practice

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Research supports rehabilitative programming that recognizes youth's level of risk to reoffend and addresses their criminogenic needs and responsivity factors. The risk–need–responsivity (RNR) framework takes a gender-neutral approach that critics assert overlooks the unique needs of female offenders. While matching treatments to RNR principles has been shown to reduce recidivism for male youth, it is unclear whether the same is true for female youth. Comparative analyses of 39 male and 37 female justice system-involved youth indicated that across RNR categories, females and males were similar in the quality and quantity of criminogenic needs and had these needs met through probation services at a similar rate. However, while the RNR assessment tool predicted recidivism equally well for male and female youth, the matching of services to RNR factors was significantly associated with reduced reoffending for boys but not for girls. Implications of the findings for theory and practice are discussed.

Keywords: risk–need–responsivity; young offenders; gender; probation; recidivism

The vast majority of justice system-involved youth are male, with female youth accounting for approximately one fourth of all juveniles charged by police and offending at a rate that is roughly 3 times less than male youth (Statistics Canada, 2011). Female youth have historically been overlooked in youth justice research, at least in part because of their lower rate of criminal behavior. More recently, girls are drawing increased attention from researchers, policy makers, and corrections staff because girls appear to be growing in relative proportion to boys throughout the justice system. In addition, girls' rate of involvement in violent crime appears to be on the rise, and there has been an increase in publicized assaults, drug violations, and public order offenses involving young females (Lazzari,

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Amundson, & Jackson, 2005; Leschied, Cummings, Van Brunschot, Cunningham, & Saunders, 2001; Sprott & Doob, 2003).

The risk–need–responsivity (RNR) model (Andrews, Bonta, & Hoge, 1990) has been used across Canada, the United States, Britain, Europe, Australia, and New Zealand to manage criminal conduct and forms the basis for many empirically derived rehabilitative treatments in these countries. Central to this framework is the assertion that effective rehabilitative service must attend to the risk principle—that intensity of service is to increase with individuals’ level of risk to reoffend; the need principle—that criminogenic needs are the appropriate targets of programming; and the responsivity principle—that service providers deliver evidence-based programming (general responsivity) and that these services be delivered in a manner that takes into account individuals’ personal characteristics and/or circumstances that affect the effectiveness of treatment (specific responsivity). A substantial body of literature supports the efficacy of programming that adheres to these principles in reducing future criminal behavior (e.g., Andrews & Bonta, 2006, 2010; Andrews et al., 1990; Dowden & Andrews, 1999). In its current form, the RNR model takes a “gender-neutral” approach in that criminogenic needs—variables related to criminal behavior—are believed to be the same for males and females.

The RNR framework informed the development of the most broadly used risk-management tool in youth justice settings across North America: the Youth Level of Service/Case Management Inventory (YLS/CMI; Hoge & Andrews, 2002). The YLS/CMI has been validated across a number of studies for its ability to predict recidivism in youth justice populations (Catchpole & Gretton, 2003; Jung & Rawana, 1999; Onifade et al., 2008; Vieira, Skilling, & Peterson-Badali, 2009). A recent meta-analysis (Olver, Stockdale, & Wormith, 2009), in which separate analyses were conducted with different subgroups of youth with respect to different types of criminal behavior (general, non-violent, violent, and sexual offending), found that the YLS/CMI significantly predicted general recidivism regardless of offense type, gender, or aboriginal status. In another recent meta-analysis of 20 studies involving predictive risk assessment instruments, 5 of which used the YLS/CMI, Schwalbe (2008) found that predictive validity estimates of the risk instruments were, by and large, equivalent for male and female youth. However, some studies have reported that the YLS/CMI is useful in predicting recidivism for male youth but not females (Bechtel, Lowenkamp, & Latessa, 2008; Schmidt, Hoge, & Gomes, 2005).

Beyond the question of the accuracy of risk prediction, it is important to consider how the RNR framework (and the instruments based on it) works in practice—from risk assessment through to treatment designation—to reduce subsequent offending. There is some evidence to suggest that girls differ from boys in the ways they engage with, and are processed through, the youth justice system. For instance, in a study examining the influence of mental health assessments on final court recommendations, Campbell and Schmidt (2000) found that while the overall concordance between clinicians’ mental health recommendations and court dispositions was 67.5%, there was a significant difference between female and male youth, with only 36% of mental-health-oriented recommendations being followed through with females compared to 60% among male offenders. Thus, questions remain as to whether the RNR framework, and/or its implementation, is as effective in addressing criminal behavior in females as it is for males.

A GENDER-RESPONSIVE APPROACH TO FEMALE OFFENDING

In addition to the research that has examined the differential effectiveness of risk assessment models for males and females, there exists a body of scholarly literature and research based on a feminist orientation, referred to as “gender-responsive” literature, that advocates for a gender-specific approach to risk assessment and treatment. These critics of a gender-neutral risk assessment approach have argued that risk assessment tools developed for male populations classify females as at risk based on their greater social, economic, and psychological vulnerability, thus often exacerbating their already marginalized status (Hannah-Moffat & Shaw, 2001). They suggest that although girls may be identified upon assessment as high “need,” it does not follow that all of these girls are high risk; the lower rate of offending among girls and the types of offenses they commit suggest they are largely not a danger to society (Bloom, 2000; Covington & Bloom, 2003). In addition, proponents of this approach emphasize that a gender-specific treatment orientation is necessary because justice-involved female youth have distinct needs and commonly engage in behaviors (e.g., running away, drug abuse, prostitution) that present more danger to themselves than to others (Hubbard & Matthews, 2008). They assert that the inappropriate categorization of females as high risk makes them more likely to receive strict sanctions that could worsen some of the very problems that got them into trouble in the first place (e.g., depression, sexual abuse, disruptions in relationships; Holtfreter & Morash, 2003). In addition, risk factors that have been empirically validated for male youth may not be the most appropriate for use with females, who generally have been excluded from large-scale empirical research (Covington, 2007). These scholars argue that girls need qualitatively different types of programs and services than boys do to adequately address their offending behavior and unique trajectories through the justice system (Hubbard & Matthews, 2008).

This literature points to potential gender-specific factors—those deemed critical for females but not for males—and gender-sensitive factors—those identified as important for males but that are even more meaningful for females—that could have a substantial impact on outcomes for justice-involved female youth. These putative gender-specific/sensitive factors have been identified based largely on the psychological, emotional, and health needs of young women that many feel are overlooked in current treatment designation processes (Covington, 2007). Theory and research in this area point to mental health, histories of abuse, and family dysfunction as particularly important when dealing with justice-system-involved female youth (Bloom, Owen, Rosenbaum, & Deschenes, 2003; Chitsabesan & Bailey, 2006; Gavazzi, Yarcheck, & Chesney-Lind, 2006; McCabe, Lansing, Garland, & Hough, 2002; Odgers, Moretti, & Reppucci, 2005). However, while these factors are no doubt relevant to the lives and experiences of females, they have generally not been established as criminogenic needs.

RECONCILING THE RNR AND GENDER-RESPONSIVE FRAMEWORKS

Until recently, the RNR and gender-responsive literatures have been treated as distinct and even antithetical approaches to addressing criminal behavior. However, Hubbard and Matthews (2008) provide a thorough analysis of the principles guiding these frameworks and the substantive differences in the resulting assessment and intervention agendas, concluding that “these ‘camps’ are more complementary than competitive, and that taken

together, they provide a blueprint on how to effectively work with girls” (p. 227). In addition, studies have emerged that examine whether factors identified in the gender-responsive literature as important to consider in female offending actually do predict criminal behavior. For example, in a meta-analysis that examined the predictors of female delinquency, Hubbard and Pratt (2002) found that factors central to the RNR framework, such as anti-social peers and antisocial personality, were the strongest predictors of offending. Variables identified as important in the gender-responsive literature, such as school and family relationships and histories of physical and/or sexual assault, had moderate to strong effect sizes as well.

Several studies have examined whether adding gender-specific variables adds predictive power to risk assessments, with somewhat mixed results. Adding putative gender-specific variables to standard RNR-based risk assessment using the Level of Service Inventory–Revised (LSI-R; Andrews & Bonta, 1995) improved prediction in a recent study of adult women (Van Voorhis, Salisbury, Wright, & Bauman, 2010). The authors reported that the gender-neutral measure alone successfully predicted recidivism in seven of eight samples (including community as well as incarcerated women), but that in six of the eight samples, variables such as family support, anger/hostility, current mental health functioning, and various forms of relationship dysfunction/victimization significantly improved the predictive power of the gender-neutral model. Van Voorhis et al. (2010) argued that the contribution to recidivism of specific risk factors, relative to each other, found in their study implies a modified set of treatment priorities for female offenders.

In contrast, Rettinger and Andrews (2010) reported that the Level of Service/Case Management Inventory (Andrews, Bonta, & Wormith, 2004) predicted recidivism strongly for both general and violent reoffending in a sample of 400 women but posited that gender-specific factors—such as histories of victimization, self-harm, and stress—did not, on the whole, add incremental validity over the eight risk–need domains comprising the standard RNR model. The exception was that financial difficulties and a measure of personal misfortune predicted recidivism for women classified as low risk to reoffend. Finally, Reisig, Holtfreter, and Morash (2006) found that the LSI-R was a robust predictor of reoffense in women classified as following a “typically male” pathway into offending but that it did not predict recidivism in women whose pathway into the justice system was defined as gendered: involvement with the justice system via histories of abuse and drug dependence (Daly, 1992).

THE PRESENT STUDY

In the present study we aimed to compare RNR-based assessment and case management for justice-involved female and male youth who received services from clinicians and probation officers. The professional mandate and training of these service providers is based on RNR principles, and they use RNR-based case management tools such as the YLS/CMI in their everyday practice. Our first goal was to compare the areas of risk and criminogenic need identified through clinician assessments for male versus female justice-involved youth. Second, we compared the proportion of identified needs that probation officers were able to address (in terms of arranging services for youth) for male versus female youth. This question is important because even if criminogenic needs areas are identified for boys and girls at the same rate, there may be gender differences in the success with which probation

officers are able to arrange for appropriate services (i.e., to successfully *match* services with identified needs). Third, after comparing the overall accuracy of the YLS/CMI in predicting reoffending for boys and girls, we examined whether matching probation-directed services to youth's individually identified RNR factors predicted recidivism equally well in male and female youth. The gender-neutral approach taken by the RNR framework leads to the prediction that the higher the proportion of service-to-needs match, the better the outcome regardless of gender (i.e., that treatment matching predicts recidivism equally well for girls and boys). However, the gender-responsive/specific framework suggests that there are a number of gender-specific/sensitive needs not assessed under the current RNR framework, and therefore service matching will predict outcomes better for boys than for girls.

METHOD

PARTICIPANTS

This mixed custodial and community sample¹ consisted of 39 males and 37 females ranging in age from 12 to 19 years ($M = 15.97$, $SD = 1.57$) who were referred for court-ordered assessment between January 2002 and January 2008 to a mental health agency in a large urban center in Ontario, Canada. Assessments were conducted by members of a multidisciplinary team of clinicians within a child and adolescent mental health program. Given the lower rate of female referrals to the clinic from the courts, the number of female participants in this study represents consecutive admissions for assessments. Male participants were matched to female participants by date of assessment and age. Before the start of the assessment, consent was requested from youth and their parents for assessment information to be used for research purposes; 92% of clients consented. Institutional Review Board approval for this study was obtained.

As Table 1 shows, participants were ethnically diverse; roughly one third of the sample was Black and another third White. The crimes precipitating their referrals for assessment included nonviolent (i.e., failure to comply with probation or court order, theft, drug-related, break and enter), sexual (i.e., aggravated sexual assault, sexual assault, invitation to touching), and violent but not sexual (i.e., robbery, assault, threatening, and murder) offenses. For over 60% of youth, the most serious charge fell into the violent nonsexual category (see Table 1). The majority of youth (62%) in the sample were diagnosed with at least one psychiatric disorder at assessment, with the number of diagnoses per youth ranging from zero to four ($M = 1.26$, $SD = 1.30$; see Table 1). The most common diagnoses were Conduct Disorder, Oppositional Defiant Disorder, and Attention Deficit Hyperactivity Disorder. Mood and/or Anxiety Disorders were also relatively common, with 27% of the sample receiving one or both of these diagnoses. There were no significant gender differences on any of the background variables (see Table 1).

PROCEDURE

Clinical charts were reviewed to gather information on demographics, offense history, charges leading to referral for assessment, scores on the YLS/CMI, and recommendations contained in the assessment report. At the time of the original assessment, a psychologist,

TABLE 1: Sample Demographic, Criminal History, Mental Health, and Recidivism Characteristics by Gender

Variable	Males		Females		Total		t test/ χ^2
Age (years)	16.1		15.8		16.0		$t = .88, p = .38$
Percent ethnicity (<i>n</i> in parentheses)							$\chi^2(2) = 3.35, p = .19$
White	25.7	(9)	46.9	(15)	35.8	(24)	
Black	40.0	(14)	31.3	(10)	35.8	(24)	
Other	34.3	(12)	21.9	(7)	28.4	(19)	
Percent index offense (<i>n</i> in parentheses)							$\chi^2(2) = 1.17, p = .56$
Nonviolent	23.1	(9)	29.7	(11)	26.3	(20)	
Violent (nonsexual)	61.5	(24)	62.2	(23)	61.8	(47)	
Sexual	15.4	(6)	8.1	(3)	11.8	(9)	
Mean number of DSM diagnoses	1.24		1.28		1.26		$t = -.13, p = .89$
Percent DSM diagnosis (<i>n</i> in parentheses)							
CD and/or ODD	26.3	(10)	30.6	(11)	28.4	(21)	$\chi^2(1) = 0.02, p = .88$
ADHD and/or LD	21.1	(8)	36.1	(13)	28.4	(21)	$\chi^2(1) = 1.39, p = .24$
Mood and/or anxiety	18.4	(7)	36.1	(13)	27.0	(20)	$\chi^2(1) = 2.10, p = .15$
Substance	21.1	(8)	11.1	(4)	16.2	(12)	$\chi^2(1) = 0.71, p = .40$
Other	18.4	(7)	11.4	(4)	14.9	(11)	$\chi^2(1) = 0.31, p = .58$
Recidivism—yes (<i>n</i> in parentheses)	46.2	(18)	35.1	(13)	40.8	(31)	$\chi^2(1) = 0.95, p = .36$
Time to recidivism (in days)	347		498		413		$t = -1.14, p = .26$

Note. DSM = *Diagnostic and Statistical Manual of Mental Disorders*; CD = Conduct Disorder; ODD = Oppositional Defiant Disorder; ADHD = Attention Deficit Hyperactivity Disorder; LD = Learning Disability.

psychiatrist, or one of two social workers with 5 to 15 years' experience assessing young offenders prospectively completed the YLS/CMI using information from multiple sources, including file material (e.g., criminal records, previous probation and mental health reports) as well as interviews with the youth and collateral sources (parents, probation officers, mental health workers, etc.). Participants' probation files were reviewed to ascertain details of the youth's sentence and information regarding what programs or components of the sentence were completed. Information from the probation files on programs assigned and youth's attendance and participation in these programs was used to determine whether the services received matched the recommendations made, according to the matching system described below.

MEASURES AND CODING

Risk to offend and criminogenic needs. The YLS/CMI (Hoge & Andrews, 2002) is a standardized instrument used to assess 12- to 18-year-old youth's criminogenic needs and estimate risk to reoffend; it also addresses case management issues relevant to treatment responsivity. The first section of this measure is a 42-item checklist that produces a detailed survey of youth risk and needs factors in eight domains. The first domain, History of Criminal Conduct, is static; although it is a significant predictor of an individual's risk to reoffend, it is not amenable to change and is therefore not a treatment target. The remaining seven domains are dynamic risk factors, or criminogenic needs: Family Circumstances and Parenting, Current School/Employment Functioning, Peer Affiliations, Alcohol and Drug Use, Leisure and Recreational Activities, Personality and Behavior, and Antisocial Attitudes. Each item is coded as present or absent. Items within each of the eight domains are

TABLE 2: Percentage of Cases for Which Clinician Recommendations Were Made Across Criminogenic Need Categories (*n* in Parentheses)

<i>Criminogenic Need Category</i>	α	<i>Gender</i>		χ^2	Φ
		<i>Male (n = 39)</i>	<i>Female (n = 37)</i>		
Education/employment	.67	82.0 (32)	70.2 (26)	1.46	-.14
Family	.61	41.0 (16)	45.9 (17)	0.19	.05
Substance use	.77	33.0 (13)	32.4 (12)	0.01	-.01
Personality	.74	35.8 (14)	64.8 (24)	6.37*	.29
Attitude	.70	2.6 (1)	13.5 (5)	3.13	.20
Leisure	.51	30.7 (12)	35.1 (13)	0.16	.05
Peer	.69	35.8 (14)	32.4 (12)	0.10	-.04

* $p < .05$.

summed and the domain score is assigned a categorical descriptor (low, medium, high). An overall score is calculated by summing all items and an overall rating of risk for recidivism is given (low, medium, high, or very high).

The YLS/CMI is reported to possess moderate to strong internal consistency for all subscales except for Substance Use, the estimate for which falls slightly below .60 (Schmidt et al., 2005). In the current study, domain reliabilities ranged from .51 to .77, with coefficient alphas falling into the acceptable range ($>.60$) in all but one domain (Leisure; see Table 2). Strong concurrent validity has been established via correlations between YLS/CMI total scores and broad and narrow band scores on the Child Behavior Checklist (Schmidt et al., 2005). Predictive validity is reported as moderate to strong, with significant correlations between YLS/CMI total scores and number of subsequent offenses and time elapsed before a new offense in both male and female youth (Catchpole & Gretton, 2003; Costigan, 1999; Jung & Rawana, 1999; Olver et al., 2009; Schmidt et al., 2005; Schwalbe, 2008; Skilling, Meeks, & Seto, 2008; Vieira et al., 2009). In the current sample, interrater reliabilities for the YLS/CMI total score among the primary clinicians was very high, with correlations ranging from .80 to .98 (average $r = .93$).

Matching of clinician-identified criminogenic needs. The question of “match” between youth’s assessed criminogenic needs and services received while on probation was examined using clinician recommendations from the assessment report as the measure of identified needs (rather than youth’s YLS/CMI scores in the need domains). This strategy reflects the focus of the study on real-world case management, as probation officers refer to the reports’ recommendations to inform their case management plans. Service-to-clinician recommendation matching was coded in each of the seven YLS/CMI criminogenic need domains by comparing clinician recommendations with evidence in youth’s probation records of appropriate program assignment and subsequent attendance. For example, a match in the Personality domain could be achieved by a clinician’s recommendation for a youth to undergo treatment for anger and subsequent probation records showing that the youth was assigned to an anger management program that was then successfully completed. Other examples of successful service-to-clinician recommendation matches include the completion of a substance abuse counseling program following a recommendation in the Substance Abuse domain, enrollment in and subsequent attendance in a school program following a recommendation in the Education domain, and evidence of engagement in

prosocial leisure activities facilitated by probation (e.g., weekly attendance at a YMCA or local community center) following a recommendation in the Leisure domain. The percentage match score was calculated by dividing the total number of *matched* needs (i.e., the total number of need areas targeted by the clinician's recommendations and met through probation-directed services) by the total number of need areas initially identified by the assessing clinician. For example, for a youth whose assessment identified five criminogenic need recommendations, if three of those needs were addressed, the youth's percentage of matched needs would be 3/5 or 60%; thus, the percentage match ranged from 0 to 100%. Interrater reliability for coding of service matching was very strong (Landis & Koch, 1977), with a Cohen's Kappa of .86 ($p < .001$).

Recidivism. Recidivism was defined as whether a youth was convicted of one or more new offenses within an approximate 3-year follow-up period after the conviction that precipitated his or her entry into the sample; data were obtained from a national police criminal record database. The average length of follow-up for the sample was 807 days, with a range of 11 to 1,431 days, depending on time to recidivism.

RESULTS

QUESTION 1: DO YLS/CMI CLINICIAN-IDENTIFIED NEEDS DIFFER FOR MALE AND FEMALE YOUTH?

There were no significant differences in the total number of YLS/CMI-based clinician recommendations made for male versus female youth, with an average of approximately three recommendations made per youth ($M = 2.77$, $SD = 1.30$). Across each of the YLS/CMI need areas, the only significant gender difference was in the Personality domain (e.g., short attention span, anger, inadequate guilt), $\chi^2(1) = 6.37$, $p < .05$, $\Phi = .29$, with a higher percentage of females (65%) than males (37%) receiving a recommendation related to this domain (see Table 2). Despite this greater likelihood of receiving a treatment recommendation, it is interesting to note that the proportion of females and males falling into the YLS/CMI moderate-high need versus low need categories in the Personality domain did not differ, $\chi^2(1) = .25$, $p = .78$, $\Phi = .06$. While few differences were found in terms of YLS-based clinician recommendations, the adolescents' overall YLS/CMI risk scores were found to differ for males ($M = 14.00$, $SD = 9.11$) and females ($M = 16.34$, $SD = 9.2$), $t(1, 71) = -2.27$, $p = .02$, $d = 0.26$, with both having scores, on average, within the moderate range and with females' average risk score being slightly higher than their male counterparts.

QUESTION 2: DO MALE AND FEMALE YOUTH HAVE THEIR CLINICIAN-IDENTIFIED NEEDS MATCHED BY PROBATION SERVICES AT A SIMILAR RATE?

The percentage match score was next examined to determine whether males and females differed in the rate at which their recommendations were met by clinical services coordinated through probation. No gender difference was found in the overall percentage match score; on average, roughly half of the clinician recommendations were successfully matched through services directed by probation ($M = 47\%$, $SD = .36$). Similar proportions of males and females were represented across the overall percentage of match classifications of low (0%-25% of recommendations matched; 25.6% for males and 24.3% for

TABLE 3: Percentage of Recommendation–Service Matches Made Across Criminogenic Need Categories by Gender (n in Parentheses)

	Gender					
<i>Criminogenic Need Category</i>	<i>Male (n = 39)</i>		<i>Female (n = 37)</i>		χ^2	Φ
Education/employment	59.0	(23)	48.7	(18)	0.82	-.10
Family	10.2	(4)	8.1	(3)	0.11	-.04
Substance use	7.7	(3)	13.5	(5)	0.68	.09
Personality	17.9	(7)	37.8	(24)	3.76	.22
Attitude	0.00	(0)	2.7	(1)	1.07	.12
Leisure	10.2	(4)	10.8	(4)	0.01	.01
Peer	10.2	(4)	0.00	(0)	4.01	-.23

females), low-medium (26%-50% match; 41.0% for males and 29.7% for females), medium-high (51%-75% match; 15.4% for males and 16.2% for females), and high (76%-100% match; 17.9% for males and 29.7% for females), $\chi^2(3) = 2.99$, $p = .39$, $\Phi = .20$. There were also no significant gender differences in the rate of matching in each of the YLS/CMI criminogenic need domains (see Table 3).

QUESTION 3: DOES MATCHING CLINICIAN RECOMMENDATIONS TO SERVICES PREDICT RECIDIVISM EQUALLY WELL IN FEMALE AND MALE YOUTH?

The first step in addressing this question was to ensure that the YLS/CMI total risk–need scores predicted recidivism for both male and female youth in the sample. A logistic regression with recidivism as the outcome and age, gender, and YLS/CMI total risk score as predictors was significant, Wald's $\chi^2(3) = 14.09$, $p < .01$; YLS/CMI total score, $B = .11$, $\chi^2(1) = 10.59$, $p < .01$, and gender, $B = -1.18$, $\chi^2(1) = 4.12$, $p < .05$, emerged as significant individual predictors of recidivism. Interpreting the odds ratios, wherein an $\exp(B) = 1$ means no effect, $\exp(B) > 1$ means that predictor increases the odds of the outcome, and $\exp(B) < 1$ decreases the odds of the outcome, Table 4 shows that for each point increase on the YLS/CMI, youth were 11% more likely to reoffend. When logistic regressions were repeated separately by gender, risk scores significantly predicted recidivism for males, $B = .12$, $\chi^2 = 6.20$, $p < .05$, and females, $B = .10$, $\chi^2 = 4.30$, $p < .05$; the overall model (consisting of age and total risk) was significant for males, $\chi^2(2) = 7.91$, $p < .05$, and approached significance for females, $\chi^2(2) = 5.45$, $p = .07$. Age did not predict recidivism and was therefore not included in subsequent analyses.

Next, a sequential logistic regression was conducted to ascertain whether the extent to which youth's recommendations were matched by services predicted recidivism, as well as to examine whether needs-to-service matching differentially predicted recidivism for males and females. To control for risk, the Criminal History domain of the YLS/CMI was included as a predictor in the first step of the regression model. Criminal History was chosen in lieu of the total YLS/CMI risk–need score because the percentage match score for each participant (included at the second step in the analysis) is in part derived from the youth's YLS-identified criminogenic needs; thus, there is overlap between the dynamic domains of risk–need included in the YLS total score and the clinician recommendations used to generate the percent match score for each participant. Criminal History and total

TABLE 4: Gender, Service Match, and Gender × Service Match Interaction as Predictors of Recidivism, Controlling for Static Risk

Model Variables	β	SE β	Wald's χ^2	df	p	exp(B)	CI (95%)	
							Lower	Upper
Model (Step) 1								
Criminal history (low vs. high)	-1.49	0.60	6.12	1	.01	0.22	1.49	16.47
Criminal history (medium vs. high) ^a	0.11	0.62	0.03	1	.86	1.11	1.37	14.56
Constant	0.18	0.43	0.18	1	.67	1.20		
Overall model at Step 1			9.66	2	.01			
Model (Step) 2								
Criminal history (low vs. high)	-1.25	0.73	2.90	1	.09	0.29	0.90	13.62
Criminal history (medium vs. high)	0.01	0.70	0.00	1	.99	1.01	0.83	14.66
Percentage match score	-3.55	1.42	6.26	1	.01	0.03	0.00	0.46
Gender	-2.63	0.99	7.01	1	.01	0.07	0.01	0.51
Percentage Match $\times$ Gender	3.72	1.73	4.60	1	.03	41.17	1.38	1,232.51
Constant	2.29	0.92	6.22	1	.01	9.90		
Step 2			11.70	3	.01			
Overall model at Step 2			21.36	5	.00			

^aThe third contrast (low vs. medium criminal history) was significant: $\beta = 1.60$, $SE\beta = .6$, Wald's $\chi^2(1) = 6.81$, $p = .01$, odds ratio = 4.95.

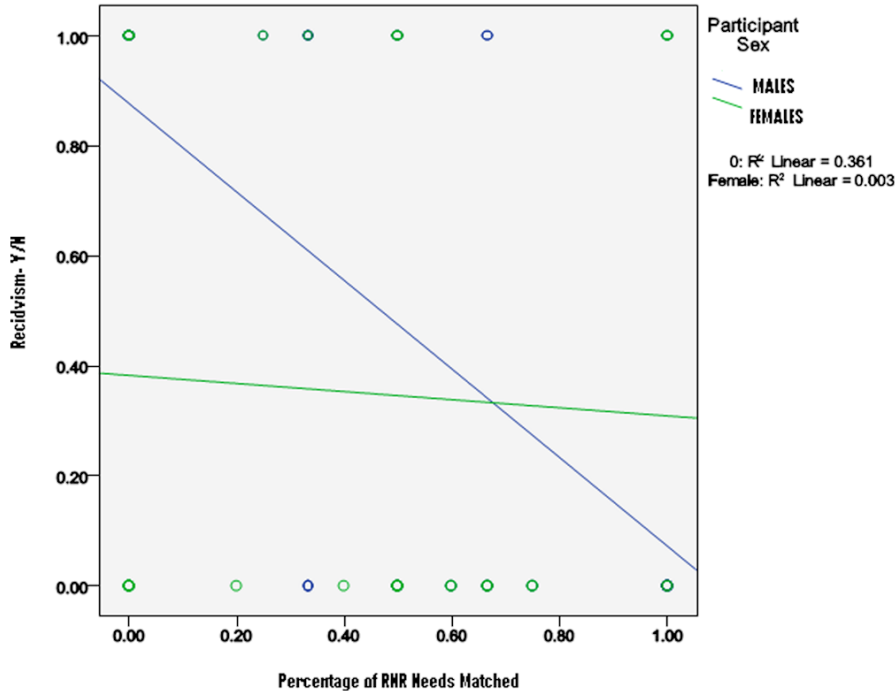


Figure 1: Gender × Match Interaction on Recidivism
Note. RNR = risk–need–responsivity.

YLS/CMI risk scores were highly correlated for our sample, $r(71) = .72, p < .01$, making Criminal History a strong proxy for risk without concern for overlap between the variables used in the analyses.

A moderation model was tested in which Criminal History² (in Step 1), and gender, percentage match, and the Gender $\times$ Percentage Match interaction (in Step 2), were used to predict recidivism. As Table 4 shows, the model was significant at both steps. In terms of Criminal History, at Step 1, the low versus high and low versus medium contrasts were significant, but the medium versus high contrasts were not. None of the Criminal History contrasts were significant at Step 2. However, at Step 2 significant main effects of gender and service matching were moderated by a significant interaction between gender and percentage match; a higher match between clinician recommendations and treatment services significantly predicted a reduction in recidivism for males but not for females (see Figure 1).

DISCUSSION

Within the generally high needs group of youth who engage in criminal behavior, females are a vulnerable minority that have yet to be studied as rigorously as their male counterparts despite being reported as having numerous and significant criminogenic and noncriminogenic needs. In this study, we explored several questions relating to the implementation of the RNR framework in assessment and case management of male and female youth.

Consistent with the findings of several previous studies (Catchpole & Gretton, 2003; Jung & Rawana, 1999; Olver et al., 2009; Onifade et al., 2008), youth's YLS/CMI scores significantly predicted recidivism for the entire sample and remained predictive when examined separately for males and females. In addition, there were few gender differences in the number and content of recommendations reported in youth's assessments; across the seven need domains explored, the only significant difference found between boys and girls was in the Personality domain, where females were more likely than their male counterparts to have received a recommendation for treatment services despite similar need scores in this domain.

It is often asserted in this literature (Colman, Han, Mitchell-Herzfeld, & Shady, 2009) that by the time a female youth enters the justice system there have been several years of family- and school-related dysfunction such that the scope and severity of presenting needs are high, and externalizing behaviors are more consistent and severe in girls who become involved with the justice system. It is many of these needs that are captured in the Personality domain of the YLS/CMI. It is also possible that the higher frequency of clinical recommendations is due to the Personality domain encompassing behaviors that are generally viewed as a more extreme aberration of adjustment for girls than for boys, as girls are often viewed as unlikely to act in violent or aggressive ways. It follows that social expectations of normative femininity could be at play in clinical recommendations whereby aggression, impulsivity, and inattention are seen as more atypical in female youth and therefore are appraised as more critical targets for intervention by clinicians. Consistent with this latter interpretation is the finding that more recommendations were made for girls in the Personality domain despite the fact that risk-need scores did not differ significantly for males and females in this domain.

There were also very few differences found between male and female youth in the rate at which probation services matched interventions to clinician recommendations. However, while the RNR-based risk assessment and case management tool (YLS/CMI) seems to be identifying needs and guiding the provision of probation services similarly for boys and girls, the efficacy of reducing recidivism through matching services to recommendations was differentially successful for male and female youth. The percentage match between clinician recommendations and treatment provision significantly predicted recidivism for the males but not females. Efforts to interpret these findings raise issues regarding the efficacy of the YLS/CMI as a RNR-based tool in accounting for females' criminogenic needs as well as the importance of attending to gender as a responsivity factor in developing and implementing interventions.

Many proponents of the gender-responsive approach assert that the need categories highlighted in the risk–need tools such as the YLS/CMI are not representative of, or are insufficient in encompassing, the unique life challenges and trajectories of justice-involved female youth and that limiting the targets of intervention to the criminogenic needs domains identified in the current RNR-based tools like the YLS/CMI ignores the problems that underlie girls' offending and the realities of the social context in which they live (Covington, 1998; McMahon, 2000). However, the ability of the YLS/CMI to predict recidivism in female youth found in the existing literature (Catchpole & Gretton, 2003; Jung & Rawana, 1999; Olver et al., 2009; Onifade et al., 2008; Vieira et al., 2009), as well as in the present study, supports the notion that it does, in fact, address many of the factors leading to recidivism for female youth. Therefore, rather than dismissing these RNR-based measurement tools as a basis for treatment designation and case management, an examination of the *breadth* and the *application* of the currently used RNR need domains is necessary.

One possible explanation for the differential success of the YLS/CMI as a RNR-based tool in guiding treatment for justice-involved male and female youth is that the tool, while inclusive of potent and empirically supported dynamic risk and need factors, has failed to include *additional* gender-specific/salient factors that may be particularly critical for female treatment outcomes. Proponents of the gender-responsive approach have long highlighted the importance of these gender-specific/salient factors. Factors such as victimization and abuse, trauma, pervasive mental health concerns, family dynamics, and availability of social supports (Bloom et al., 2003; Cauffman, Lexcen, Goldweber, Shulman, & Grisso, 2007; Douglas & Plugge, 2008; Gavazzi et al., 2006; Odgers et al., 2005; Vannatta, 1996; Van Voorhis, Salisbury, Wright, & Bauman, 2008) have been suggested as important both theoretically and in numerous qualitative studies with justice-involved youth and adult female samples. The primary criticism of these findings has been that while the factors identified in this literature are important for general mental and social health, they have not been empirically linked to reoffending. However, the fact that these gender-specific/salient factors are not incorporated into the scores on the risk–need measures could be a result of the general lack of young female participants in correctional research, as these gender-sensitive factors may not have been identified as criminogenic needs in large-scale RNR research that is dominated by male participants.

Research on adult females (e.g., Van Voorhis et al., 2010) suggests that the addition of gender-specific/salient factors to the established gender-neutral risk assessment tools could add greater specificity to prediction models and points to additional factors to guide intervention with women. The exclusion of certain gender-specific/salient factors in the RNR

risk–need tools may explain why the assessment tool seemed to effectively guide intervention to reduce the rate of recidivism of the males in our sample but appeared to have little effect on the females. Perhaps there is a broader scope of variables in addition to those already included in the tools, or a different constellation of gender-neutral/responsive factors (e.g., economic, parenting issues, abuse histories, mental health problems; Reisig et al., 2006; Rettinger & Andrews, 2010; Van Voorhis et al., 2010) that need to be addressed when working with justice-system-involved females. A goal of future research is to examine whether such factors add power to risk assessment for female youth, and if so, how addressing these needs, in combination with the current risk–need factors, affects reoffending in this population.

Another potential explanation for the differential success of matching treatment to the risk–need factors identified is the role of specific responsivity in interventions designed to decrease female recidivism. Responsivity has typically referred to the styles and modes of service delivery that should be employed when providing intervention services. More specific responsivity factors, such as an individual's learning style, ability, motivation, mental health, and social skills, are also relevant for the intervention to have optimal effect (Andrews & Bonta, 2006). Applications of the responsivity principle, particularly in regard to specific responsivity, are consistent with the gender-responsive literature that suggests that girls would benefit from treatments based on relationships and that emphasize the importance of familial support in increasing the likelihood of female youth engaging with programs (Bloom et al., 2003; Hubbard & Pratt, 2002; Odgers et al. 2005; Wright, Van Voorhis, Salisbury, & Bauman, 2008).

According to Ward, Mesler, and Yates (2007), one of the major criticisms of the RNR model has been the distinction made between criminogenic and noncriminogenic needs, as targeting noncriminogenic needs is a necessary condition for any intervention that requires offenders to be attentive and receptive to the therapeutic content of sessions. Present results suggest that the current assessment tools based on the RNR model are targeting important criminogenic need categories for preventing recidivism in boys but it is not so clear that this is true for girls, and at the very least, more attention needs to be paid to *how* services are being delivered, especially for female youth. Further elucidation of specific responsivity factors and their utilization in treatment planning could optimize rehabilitative efforts for male and female youth alike but may be even more critical for female youth, who may not be receiving and engaging with essential services because of incongruence in treatment modes. Generally, the impact of intervention targeted at reducing criminogenic needs that is sensitive to noncriminogenic needs has yet to be studied in a systematic way. More research is needed to examine how gender affects clinicians' diagnostic decisions, probation officers' treatment allocation decisions, and the dynamics of treatment programs.

Recent reviews of the RNR framework have emphasized the importance of therapeutic integrity as the fourth principle (Andrews & Bonta, 2006). Indeed, it is not possible to comment on the utility of the model without considering the fidelity with which it has been implemented. In the context of clinical and probation services, whose mandates are to follow the RNR framework in assessment and case management, the present study endeavored to examine service matching as reflected in youth's probation records. A limitation of our study is that it was not possible to measure individual program or staff quality in the many agencies from which youth received their clinical services, nor did we measure the extent to which probation officers actually followed the RNR framework in their

management of youth's cases. It is therefore possible that the lack of relationship between service-to-need matching and recidivism in girls is related to a failure to *implement* the existing RNR framework as intended, particularly in relation to case management for girls.

Following from this point, another important direction for future research is an investigation into the barriers to providing and accessing appropriate services for youth involved with the criminal justice system. Although there were very few differences in needs and service acquisition noted between the males and females, on average youth had only 50% of their clinical recommendations addressed via service, with most youth falling into the low-medium (26%-50%) match category. Rates of matching also varied substantially across criminogenic need domains, with very low levels of recommendation-to-service matching in a number of critical domains (e.g., antisocial attitudes, antisocial peers). Lack of availability of community services for these domains may in part account for the poor match. Interestingly, the paucity of appropriate services to address these important needs may also serve as a barrier to adherence during assessment. Skilling (2011) examined clinicians' adherence to the RNR framework using the YLS/CMI in their assessment recommendations. For youth falling into the high need category, clinicians made explicit recommendations approximately 80% to 90% of the time in the Education/Employment, Substance Abuse, Personality, and Family domains and roughly 50% to 60% of the time in the Attitude/Orientation, Leisure, and Peer domains. Lack of programs was noted as a primary reason for not including recommendations to meet these needs, even when youth were rated as high risk and need. Additional research is needed to examine barriers to service referral, provision, and delivery from the perspective of various front-line workers, including clinicians, probation officers, and judges.

The results of the present study are constrained by a somewhat small sample size and the fact that participants were drawn from a mental health facility through which they received a court-ordered clinical assessment. However, this methodology allowed for enhanced internal validity of the study: RNR factors were identified prospectively through a comprehensive, consistent, multisource, multimethod assessment process unlikely to be available through regular youth justice services, thus yielding high-quality data on youth's individual RNR factors. In regard to the generalizability of the findings, participants' rate of mental health problems and diagnoses are consistent with the findings of various studies examining the prevalence of mental health issues within juvenile justice settings that report rates ranging from 40% to 86% across Canada, the United States, and Sweden (Shufelt & Coccozza, 2006; Skowrya & Coccozza, 2007; Stahlberg, Anckarsater, & Nilsson, 2010; Teplin, Abram, McClelland, Dulcan, & Mericle, 2002; Wasserman, McReynolds, Lucas, Fisher, & Santos, 2002; Wasserman, McReynolds, Schwalbe, Keating, & Jones, 2010). In terms of criminal justice variables, the rate of offense (the index offense) for crimes classified as violent and/or sexual was higher in our sample than government statistics report for the general youth justice population in Ontario (Thomas, 2008). However, although a larger percentage of our sample engaged in violent and/or sexual offenses at the time of their assessment, their assessed level of risk fell in the moderate range overall, comparable to other samples of nonreferred custodial youth (Hoge & Andrews, 2011). Thus, our study's method allowed for an in-depth examination of the needs and services received for justice-involved youth who commit more serious crimes—for whom the treatment-matching process is arguably most critical—while the sample's relatively typical mental health and risk scores permit generalizability of the findings beyond the population of youth receiving court-ordered mental health assessments.

Appropriate and effective intervention for youth offending behavior is a critical goal of the justice system. Without successful intervention, criminal behavior is highly resistant to change, and lifetimes of offending result in substantial costs to society. Youth justice officials are faced with balancing the ideals of proportionate accountability, protecting community safety, rehabilitation, and reintegration (Maurutto, Hannah-Moffat, & Bloomenfeld, 2008) amid the realities of limited and, at times, ineffective services. The present research suggests the need for efforts to ensure better and more consistent matching of services with youth's criminogenic needs, as doing so is associated with reduced recidivism for male youth. Results also suggest that particular attention must be paid to the impact of possible gender-specific needs and responsivity factors on recidivism and to the possibility of their inclusion in treatment designation. The RNR principles have provided a useful framework for correctional intervention and rehabilitation and the development of risk-needs measures; these principles, and the tools based on them, require continued development of their specificity in identifying the needs and trajectories of subgroups, such as female youth, that have, until recently, been largely overlooked in correctional research.

NOTES

1. At time of assessment and entry into the study, some youth had been sentenced to a custodial sentence followed by a probation term, although in Canada custody stays are generally brief. All youth had a probation term as part of their sentence, and thus services received during this term were the focus of the study.

2. The categorical criminal history variable (low, medium, high) was used rather than the continuous (6-point) scale, which had a large positive skew.

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