The Relationship between Mental Disorder and Recidivism in Sexual Offenders

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The importance of mental illness as a risk factor for violence has been debated with significant implications for mental health policy and clinical practice. In offender samples, mental health diagnoses tend to be unrelated to recidivism, although this effect has been questioned recently in sexual offenders. In the present, prospective investigation, the relevance of several mental health diagnoses and relevant co-morbidity is examined as predictors of various types of recidivism in two distinct samples of sexual offenders who were followed up to 27 years in the community. Results indicated that mental health diagnoses were not predictive of recidivism on their own or in multivariate categories, although comorbid substance-use disorders and some personality disorders showed some predictive validity. Results are discussed in the context of a social learning model of crime and in terms of the treatment of sexual offenders.

Keywords: sex offender, mental health, diagnoses, recidivism

There has been a long-standing belief by the public that individuals with a mental illness are significantly more dangerous than individuals without a mental illness. This is underscored by the fact that mental illness is significantly overrepresented in the criminal justice system (Corrado, Cohen, Hart, & Roesch, 2000; Diamond et al., 2001; Fazel & Danesh, 2002). Although most studies have reported that 10% to 40% of offenders have a mental illness, estimating prevalence is difficult because of substantial variability across studies in sample composition and in assessment and diagnostic methodology. Indeed, rates vary considerably depending on a number of factors, such as the method used to diagnose or assess for mental illness, whether the criterion is lifetime prevalence versus current presentation, and the type of mental disorder under investigation.

Relationship between Mental Illness and Violence

There has been an ongoing debate regarding the extent to which mental illness is a risk factor for violence (Markowitz,

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2011; Monahan, 1981), which is most often defined as actual or attempted infliction of harm on another person. On the one hand, many researchers subscribe to the criminalization hypothesis or psychopathological model of criminal behavior, whereby untreated mental illness, particularly schizophrenia and other psychotic disorders, is considered a direct cause of criminal behavior (Douglas, Guy, & Hart, 2009; Fazel et al., 2009; Hodgins, 2008). There are indeed a number of large scale studies and meta-analytic reviews that have supported this hypothesis. In a large Danish cohort of 358,180 people, Brennan, Mednick, and Hodgins (2000) found that the risk of violence was 4.6 times higher for men with schizophrenia and about 23 times higher among women with schizophrenia compared to the general population. This association was maintained even after controlling for substance abuse and personality disorders. Two more recent meta-analyses similarly reported that psychosis was associated with an increased risk of violence and was particularly salient when the psychosis was comorbid with a substance use disorder (Douglas et al., 2009; Fazel et al., 2009). Although most studies have focused on psychotic disorders, some studies have associated other forms of serious mental illness, such as bipolar disorder, with violence (Baillargeon et al., 2009).

In contrast to the studies cited earlier, there are a number of studies which have failed to identify a significant link between psychosis or other forms of serious mental illness and violence (Appelbaum, Robbins, & Monahan, 2000; Elbogen & Johnson, 2009; Witt, van Dorn, & Fazel, 2013). Some researchers have argued that methodological diversity across studies accounts for much of the discrepant findings reported in the literature (Douglas et al., 2009). One possible confounding factor is sample composition, such that serious mental illness is a risk factor for violence among the general population but this effect does not generalize to offenders.

The vast majority of studies using offender samples have shown psychiatric diagnoses to be unrelated to recidivism and that the predictors of recidivism are largely shared between mentally disordered offenders and non-disordered offenders. Andrews and Bonta (1994, 2010) presented a social learning theory of criminal behavior, called the *General Personality and Cognitive Social Learning* (GPCSL) model. According to the GPCSL, there are eight robust predictors of criminal behavior that reside within the individual or their immediate social learning environment: criminal history, procriminal companions, procriminal attitudes, antisocial personality pattern, education/employment, family/marital, substance abuse, and leisure/recreation. Mental health variables were not considered significant predictors of criminal behavior.

In a meta-analysis of 58 studies of mentally disordered and non-disordered offenders, psychiatric diagnosis was not associated with recidivism and psychosis was inversely related to recidivism (Bonta, Law, & Hanson, 1998). In an updated meta-analysis of 126 studies, schizophrenia was again not significantly related to general ($d = -.03$) or violent ($d = -.11$) recidivism (Bonta, Blais, & Wilson, 2013).

These two meta-analyses demonstrated that the best predictors of recidivism were consistent with the central eight risk factors identified in the GPCSL. More recently, Rezansoff, Moniruzzaman, Gress, and Somers (2013) examined offense trajectories of a large sample of provincial offenders ($n = 31,014$) and showed that offenders with a non-substance related mental disorder were at no greater risk of recidivism than those without a diagnosis. Skeem and colleagues (2013) also reported that mentally disordered and nondisordered offenders shared similar risk factors and the most predictive factors were consistent with the GPCSL model, rather than those variables unique to mental illness.

Mental Illness and Violence in Sexual Offenders

Consistent with the research on general offenders, Hanson and Morton-Bourgon (2004) reported that severe psychological dysfunction (psychosis) was not significantly related to sexual recidivism ($d = -0.03$, $n = 1,268$) nor was depression ($d = -0.13$, $n = 850$). However, in one notable exception, Långström, Sjöstedt, and Grann (2004) examined 1,215 Swedish sexual offenders released between 1993 and 1997. Mental illness was assessed during inpatient care using the International Classification of Diseases-9 and -10 (World Health Organization, 1980, 1992) and diagnostic categories were collapsed. Individuals were followed for an approximate average of six years, after which sexual, nonsexually violent, and any violent (sexual or violent nonsexual) recidivism was measured. Results indicated that substance abuse or dependence, personality disorder, psychosis, any psychiatric disorder, and any inpatient care was significantly associated with sexual recidivism. Any psychiatric disorder, alcohol abuse or dependence, any inpatient care, and personality disorder were significantly associated with violent nonsexual recidivism. The study by Långström et al. was notable because of the large and relatively unselected sample of sexual offenders and has been used by some to suggest that perhaps mental illness may be an important predictor of recidivism for some sexual offenders (Mann, Hanson, & Thornton, 2010).

Since the Hanson and Morton-Bourgon (2004) meta-analysis, there have been relatively few studies published examining the relationship between serious mental illness and recidivism in sexual offenders. Abracen and colleagues (2014) examined 136 high-risk sexual offenders residing in the community. The presence of a mental disorder was based on file review and was coded as present if a diagnosis was made within the past five years. Among the 11 diagnoses/behaviors, only borderline personality disorder and attention-deficit hyperactivity disorder were positively associated with any criminal recidivism or suspension. Other disorders, such as depression, anxiety, and psychosis, were unrelated to recidivism, whereas paraphilias were inversely related to recidivism. Singer, Maguire, and Hurtz (2013) sampled 320 paroled sexual offenders and compared those who were reincarcerated for a sexual offense to those who did not reoffend. Results

indicated that the recidivists were more likely to be classified as mentally ill (no specific diagnoses were listed) than the comparison group of non-recidivists. This may not be surprising, given that a number of studies have shown mentally ill offenders to be more likely to fail under correctional supervision than nonmentally disordered offenders; a finding that has been attributed to system bias/stigma, rather than criminal behavior (Skeem, Manchak, & Peterson, 2011).

Present Study

In this prospective study, we examined the predictive accuracy of several mental disorders in a relatively large sample of Canadian sexual offenders. The vast majority of studies examining the relevance of mental illness as a risk factor for violence have been conducted using samples of general offenders as opposed to sexual offenders. The relevance of mental illness as a risk factor for recidivism in sexual offenders has been questioned (Mann et al., 2010). We hypothesized that recidivism would be best predicted by factors identified by the GPCSL and previous meta-analyses (Hanson & Morton-Bourgon, 2005). Additionally, we predicted that mental health diagnoses would not be associated with recidivism and would fail to show any incremental validity after controlling for needs that are consistent with the GPCSL.

STUDY 1

METHOD

Participants

Participants were a sample of 401 federally incarcerated sex offenders who received high-intensity sex offender treatment services. Treatment was provided by the Clearwater Program at the Regional Psychiatric Centre (RPC) – a maximum security psychiatric treatment facility, located in Saskatoon, Saskatchewan, Canada. The RPC is under the jurisdiction of the Correctional Service of Canada (CSC) and houses federal offenders serving sentences of at least two years in duration. Participants were admitted to the program between 1982 and 2008 (median year of admission was 1992) and were an average age of 33.9 years ($SD = 10.4$) on admission. Most of the sample was Caucasian ($n = 237$, 59.1%), followed by Aboriginal descent ($n = 151$, 37.7%), with the remainder being Black ($n = 6$, 1.5%), Asian ($n = 4$, 1.0%), or other/unknown racial/ethnic descent ($n = 3$, 0.7%).

Materials

Violence Risk Scale-Sexual Offender Version (VRS:SO)

The Violence Risk Scale-Sexual Offender version (Wong, Olver, Nicholaichuk, & Gordon, 2003) is a 24-item

sexual offender risk assessment and treatment planning tool. The VRS:SO includes 7 static items and 17 dynamic items that are all either empirically, theoretically, or conceptually related to increased risk for sexual recidivism (e.g., cognitive distortions, interpersonal aggression, deviant sexual preference, intimacy deficits; see Olver et al., 2007 for a list and brief description of dynamic items). The dynamic variables are consistent with the notion of psychologically meaningful risk factors or criminogenic needs identified by the GPCSL model. Several studies have shown scores on the VRS:SO to be significantly associated with recidivism (Beggs & Grace, 2011; Olver et al., 2007). Acceptable interrater reliability was obtained for VRS:SO posttreatment dynamic scores on 35 cases randomly selected from the larger pool of 321 cases in Olver et al. (2007) using a single rater, two way mixed effects, consistency measure intraclass correlation coefficient ($ICC = .79$).

Diagnosis

All possible diagnoses were included in the analyses and were coded as present or not present. Diagnoses were based on criteria listed in the DSM-III, DSM-III-R, DSM-IV, or DSM-IV-TR (APA, 1980, 1987, 2000) and were assigned by the intake or discharging psychiatrist at the RPC. These diagnoses were made during routine clinical practice and, as such, it was not possible to evaluate interrater reliability. Diagnoses were collapsed into relevant categories including any paraphilias, any personality disorder, antisocial personality disorder (including Axis II clinical diagnoses of antisocial personality traits), substance use disorders, and non-substance related mental disorders (NSMD). NSMD's included any Axis I mental health diagnosis that did not also have a co-occurring substance use disorder. The largest proportion of diagnoses that comprised NSMD's were mood disorders (41%, $n = 14$) followed by psychotic disorders (18%, $n = 6$). Finally, we assessed the relevance of concurrent diagnoses; that is, the presence of a substance use disorder and antisocial personality disorder, as well as the presence of a substance use disorder and a paraphilia.

Procedure

Data Extraction

Full approval was obtained from the University of Saskatchewan Behavioural Research Ethics Board and the Correctional Service of Canada. The sample was comprised of two subsamples of Clearwater patients. Archival VRS:SO ratings were available for a subsample of 321 offenders; of whom diagnostic information was available for 316 men. Ratings were completed by trained research assistants and were based on comprehensive institutional files. Prospective VRS:SO ratings were

completed for a smaller subsample of 78 cases by trained RPC program staff during the course of routine assessment and treatment activities; an additional seven cases had diagnostic information but no VRS:SO ratings. The prospective VRS:SO ratings were extracted from treatment files by trained graduate student research assistants. Diagnostic information was generally extracted from the psychiatric intake and discharge reports completed by the admitting and discharging psychiatrist. Reports generated before the year 2000 were read directly from patient files (hard copy) and reports for more recent admissions were extracted from the Offender Management System (OMS; CSC's electronic database of offender files). Hard copy files were reviewed for 316 offenders, while the remaining 85 cases were obtained from OMS.

Recidivism Variables

Outcome data were retrieved between May 15, 2010 and September 15, 2011 through the Canadian Police Information Centre (CPIC), a nationwide electronic database of officially recorded criminal charges and convictions. Sexual recidivism was defined as any criminal charge or conviction for a sexually motivated offense, including offenses that were adjudicated as nonsexual crimes (e.g., an incident of coercive sexual activity adjudicated as a nonsexual assault, or a sexual assault and homicide adjudicated as one conviction of murder) or sexual breaches when additional documentation (e.g., Criminal Profile Report) was available suggesting the offense to be sexually motivated. A sexual breach is a formal conviction for a technical violation that was determined to be sexual in nature (e.g., attempted commission of a sexual offense, accessing potential victims). This verification could only be performed if the conviction involved a return to federal custody. Violent recidivism was defined as any new criminal code conviction for an offense against the person (e.g., assault, robbery), including sexual offenses. General recidivism included any criminal code conviction. All outcomes were coded in a binary manner (1–recidivate, 0–did not recidivate) along with charge/conviction date for the first new offense of a given category in order to perform survival analyses.

RESULTS

The vast majority of the sample (95%) had at least one mental health diagnosis (i.e., NSMD, SUD, PD, ASPD, or a Paraphilia). Among those who were diagnosed, 8% (34/401) were diagnosed with a NSMD without any co-occurring substance use disorder. The number increased to 15.5% (62/401) when taking into account individuals with an Axis I disorder who may have also had a co-occurring substance use disorder; this broader operationalization is used in all subsequent NSMD analyses. Approximately 52% had been diagnosed with a substance use disorder (SUD) (210/401).

Almost three quarters (74.1%) of the sample was diagnosed with a personality disorder (PD) (297/401). Forty-seven percent had been diagnosed with antisocial personality disorder (ASPD) (189/401). Twenty-four percent (97/401) had been diagnosed with a paraphilia. Unfortunately, there was no information available on the specific type of paraphilia.

Outcome data were available for 392 offenders, while the remaining nine participants had either not been released or had died very shortly after release and were excluded from analysis. The men in this study were followed up an average 15.5 years post-release ($SD = 5.9$) with a median year of release of 1994. The overall recidivism rates were as follows: sexual recidivism (27.8%; $n = 109$), violent (including sexual) recidivism (51.1%, $n = 205$), and general recidivism (69.6%, $n = 273$).

In Table 1, we present the VRS:SO mean scores for 394 diagnosed and undiagnosed offenders for whom these risk assessment data were available. Results indicated that individuals diagnosed with a paraphilia obtained higher scores on the VRS:SO post-treatment dynamic items than those not diagnosed with a paraphilia ($d = .36$), 95% CI [0.13, 0.59].

The base rates of sexual, violent, and general recidivism outcomes among the psychiatric diagnoses are displayed in Table 2. The univariate relationship of diagnostic category membership with each recidivism outcome was examined through chi square and odds ratio (OR) statistics, the latter of which are presented with 95% CIs in this table. Analyses indicated that there was a dependent relationship between sexual recidivism and the presence of an SUD + ASPD diagnosis, $\chi^2 (df = 1, n = 392) = 4.38, p = .036$. The odds of sexual recidivism increased by 63% for offenders with this dual diagnosis compared to offenders without such co-morbidity. With the exception of NSMDs, higher base rates of sexual recidivism were observed among each of the diagnostic categories, although no other findings were significant.

Dependent relationships were evident between violent recidivism and an SUD diagnosis, $\chi^2 (df = 1, n = 392) = 11.56, p < .001$; a PD, $\chi^2 (df = 1, n = 392) = 12.42, p < .001$; ASPD, $\chi^2 (df = 1, n = 392) = 7.27, p = .007$;

TABLE 1
VRS:SO Mean Posttreatment Scores by Diagnosis

| Diagnosis | Present Diagnosis | | No Diagnosis | | | |
	N	M (SD)	N	M (SD)	t	d
NSMD	59	24.42 (6.84)	335	22.99 (7.67)	−1.34	0.19
SUD	207	23.06 (6.87)	187	23.36 (8.25)	0.39	−0.04
PD	293	23.41 (7.63)	101	22.60 (7.31)	−0.93	0.11
ASPD	220	23.78 (7.73)	174	22.48 (7.29)	−1.69	0.17
Paraphilia	95	25.25 (7.91)	299	22.55 (7.33)	−3.07*	0.36

Note. SUD = substance use disorder; NSMD = non-substance related mental disorder, PD = personality disorder; ASPD = antisocial personality disorder. $N = 394$.

*$p < .01$.

TABLE 2
Frequency (Percentage) of Recidivism Outcomes among Individuals with and without a Diagnosis (Clearwater)

Diagnostic predictor	Sexual recidivism			Violent recidivism			General recidivism		
	Diagnosis	No diagnosis	OR [95%CI]	Diagnosis	No diagnosis	OR [95%CI]	Diagnosis	No diagnosis	OR [95%CI]
NSMD	26.2	28.1	0.91 [.49, 1.67]	45.9	53.5	0.74 [.43, 1.28]	62.3	71.0	0.68 [.38, 1.19]
SUD	31.2	24.3	1.43 [.92, 2.24]	60.5	43.2	2.00*** [1.34, 3.00]	77.1	61.6	2.11*** [1.36, 3.27]
PD	28.8	25.0	1.22 [.73, 2.03]	57.6	37.5	2.27*** [1.43, 3.60]	74.3	56.7	2.21*** [1.38, 3.53]
ASPD	28.7	26.7	1.11 [.71, 1.73]	58.8	44.3	1.79** [1.20, 2.68]	77.8	59.7	2.37*** [1.52, 3.68]
Paraphilia	31.6	26.6	1.27 [.77, 2.11]	47.4	53.9	0.77 [.49, 1.22]	57.9	73.4	0.50** [.31, .81]
Any dual diagnosis	32.2	23.9	1.51 [.97, 2.36]	61.2	44.4	1.97*** [1.31, 2.95]	77.6	62.8	2.06*** [1.32, 3.22]
DD: SUD + ASPD	34.6	24.5	1.63* [1.03, 2.59]	65.4	46.0	2.21*** [1.43, 3.43]	84.3	62.6	3.19*** [1.86, 5.47]
DD: SUD + paraphilia	41.2	26.7	1.94 [.94, 3.99]	70.6	50.6	2.35* [1.09, 5.05]	82.4	68.5	2.15 [.87, 5.34]

Note. N = 392. NSMD = non-substance related mental disorder, SUD = substance use disorder, PD = personality disorder; ASPD = antisocial personality disorder; DD = dual diagnosis (SUD comorbidity), OR = Odds ratio statistic.
*p < .05, **p < .01, ***p < .001.

any dual diagnosis, χ^2 ($df = 1$, $n = 392$) = 10.91, $p < .001$; SUD+ASPD, χ^2 ($df = 1$, $n = 392$) = 12.84, $p < .001$; and SUD+paraphilia, χ^2 ($df = 1$, $n = 392$) = 4.99, $p = .025$. The odds of violent recidivism increased by 100% for those with an SUD, 127% for those with a PD, 79% for those with ASPD, 97% for those with any dual diagnosis, 121% for those with an SUD+ASPD diagnosis, and 135% for those with an SUD+paraphilia diagnosis compared to those without that particular diagnosis.

Finally, dependent relationships were evident between general recidivism and an SUD diagnosis, χ^2 ($df = 1$, $n = 392$) = 11.22, $p < .001$; a PD, χ^2 ($df = 1$, $n = 392$) = 11.16, $p < .001$; ASPD, χ^2 ($df = 1$, $n = 392$) = 8.91, $p = .003$; a paraphilia, χ^2 ($df = 1$, $n = 392$) = 8.19, $p = .004$;

any dual diagnosis, χ^2 ($df = 1$, $n = 392$) = 10.27, $p < .001$; and, SUD+ASPD, χ^2 ($df = 1$, $n = 392$) = 18.97, $p < .001$. The odds of general recidivism increased by 111% for those with an SUD, 121% for those with a PD, 137% for those with ASPD, 106% for those with any dual diagnosis, and 219% for those with an SUD+ASPD diagnosis compared to those without that particular diagnosis. Conversely, the odds of general recidivism decreased by 50% for those with a paraphilia diagnosis compared to offenders without a diagnosis of paraphilia.

A series of Cox regression survival analyses were used to examine the unique contribution of the diagnostic categories previously examined after controlling for criminogenic variables tapping into needs consistent with the

TABLE 3
Cox Regression Survival Analyses: Incremental Validity of Diagnoses in the Prediction of Recidivism Criteria (Clearwater)

Regression model (1-8)	Sexual recidivism					95% CI		Violent recidivism					95% CI		General recidivism					95% CI	
	B	SE	Wald	p	e^B	LL	UL	B	SE	Wald	p	e^B	LL	UL	B	SE	Wald	p	e^B	LL	UL
1 Dynamic total	.07	.01	38.47	**<.001**	1.07	1.05	1.10	.05	.01	29.62	**<.001**	1.05	1.03	1.07	.03	.01	10.02	**.002**	1.03	1.01	1.04
NSMD	.09	.27	0.10	.750	1.09	0.64	1.86	−.02	.20	0.01	.921	0.98	0.66	1.46	−.05	.18	0.09	.762	0.95	0.67	1.34
2 Dynamic total	.07	.01	8.96	**<.001**	1.07	1.05	1.10	.05	.01	29.82	**<.001**	1.05	1.03	1.07	.03	.01	9.50	**.002**	1.03	1.01	1.04
SUD	.31	.20	2.56	.109	1.37	0.93	2.00	.54	.14	13.98	**<.001**	1.71	1.29	2.26	.51	.12	16.64	**<.001**	1.66	1.30	2.11
3 Dynamic total	.07	.01	38.40	**<.001**	1.07	1.05	1.10	.05	.01	27.31	**<.001**	1.05	1.03	1.07	.02	.01	8.54	**.003**	1.02	1.01	1.04
PD	−.07	.23	0.09	.769	0.94	0.60	1.46	.45	.18	6.30	**.012**	1.57	1.10	2.22	.39	.15	6.70	**.010**	1.47	1.10	1.97
4 Dynamic total	.07	.01	38.64	**<.001**	1.07	1.05	1.10	.05	.01	27.38	**<.001**	1.05	1.03	1.07	.02	.01	7.62	**.006**	1.02	1.01	1.04
ASPD	−.08	.20	0.17	.676	0.92	0.63	1.35	.34	.14	5.41	**.020**	1.40	1.05	1.86	.46	.13	13.44	**<.001**	1.59	1.24	2.03
5 Dynamic total	.07	.01	37.60	**<.001**	1.07	1.05	1.10	.05	.01	31.47	**<.001**	1.05	1.03	1.07	.02	.01	12.79	**<.001**	1.03	1.01	1.05
Paraphilia	.08	.22	0.15	.703	1.09	0.71	1.66	−.24	.17	2.04	.153	0.78	0.56	1.10	−.45	.15	8.69	**.003**	0.64	0.47	0.86
6 Dynamic total	.07	.01	38.58	**<.001**	1.07	1.05	1.10	.05	.01	29.24	**<.001**	1.05	1.03	1.07	.03	.01	9.25	**.002**	1.03	1.01	1.04
Dual diagnosis	.35	.19	3.23	.072	1.41	0.97	2.06	.52	.14	13.94	**<.001**	1.69	1.28	2.23	.50	.12	16.92	**<.001**	1.65	1.30	2.10
7 Dynamic total	.07	.01	37.70	**<.001**	1.07	1.05	1.10	.05	.01	28.47	**<.001**	1.05	1.03	1.07	.02	.01	8.27	**.004**	1.02	1.01	1.41
DD: SUD + ASPD	.35	.20	3.12	.077	1.41	0.96	2.07	.54	.14	14.43	**<.001**	1.72	1.30	2.27	.65	.13	26.32	**<.001**	1.91	1.49	2.44
8 Dynamic total	.07	.01	37.60	**<.001**	1.07	1.05	1.10	.05	.01	28.59	**<.001**	1.05	1.03	1.07	.03	.01	9.46	**.002**	1.03	1.01	1.04
DD: SUD + paraphilia	.43	.29	2.26	.133	1.54	0.88	2.70	.49	.22	5.04	**.025**	1.63	1.06	2.51	.37	.20	3.34	.067	1.44	0.97	2.14

Note. N = 388 for all analyses. NSMD = non-substance related mental disorder, SUD = substance use disorder, PD = personality disorder, ASPD = antisocial personality disorder (or traits), DD = dual diagnosis (SUD comorbidity). VRS-SO dynamic are posttreatment scores. Significance identified in bold.

GPCSL. We controlled for posttreatment dynamic VRS:SO score, given that this is a composite measure of criminogenic needs on a sex offender tool, and the posttreatment ratings incorporate treatment related changes, thus providing a more accurate appraisal of posttreatment risk and a more rigorous test of the incremental value of the diagnoses. There are eight sets of regression analyses, for which the VRS:SO posttreatment dynamic score was entered simultaneously with a binary diagnostic variable (coded diagnosis present-not present). The dependent variables were sexual, violent (including sexual), and general recidivism. Results are displayed in Table 3.

With regard to sexual recidivism, the posttreatment dynamic total score of the VRS:SO was significantly related to outcome for all regression models. Specifically, a one unit increase in dynamic score increased the hazard rate by 7%. The presence of NSMD did not add to the predictive equation when entered along with the VRS:SO (model 1) nor did any of the other diagnostic categories (models 2–8).

In terms of violent recidivism, the dynamic total score of the VRS:SO, and the presence of an SUD, any PD, ASPD and each set of dual diagnoses (any DD, ASPD, or paraphilia) each uniquely predicted this outcome (models 2, 3, 4, 6, 7, and 8, respectively). A one unit increase on the dynamic score of the VRS:SO increased the hazard rate by 5% while the presence of one or more sets of the diagnoses each increased the hazard rate from 40% to 72%. Again, the presence of NSMD did not add to the predictive equation.

Finally, in terms of general recidivism, the dynamic total score of the VRS:SO and each diagnostic category were each significantly related to outcome, with the exception of NSMD and SUD + paraphilia. Across the models examined, a one unit increase on the dynamic score increased the hazard rate by 2% to 3% (depending on the model), while the presence of one of the diagnostic categories uniquely predictive of outcome increased the hazard rate by 47% to 91%.

DISCUSSION

In the present study, we examined the relationship between mental disorder and recidivism in a treated Canadian correctional sample of sexual offenders. The vast majority of the sample (95%) had a mental disorder and a significant proportion of offenders had an SUD and a PD, particularly ASPD. Importantly, these base rates are not representative of general offender populations, but rather reflect a select, broadly high risk sample of sex offenders attending treatment at a corrections-based mental health facility.

Consistent with extant findings (see Rezansoff et al., 2013), NSMDs were not predictive of recidivism outcomes either on their own or in multivariate categories. Cox regression analyses extended these findings. The VRS:SO dynamic score (a direct measure of criminogenic risk and need) significantly predicted sexual, violent, and general

recidivism. The only diagnostic categories that were associated with risk and recidivism were personality disorders (including ASPD), SUDs, and dual diagnoses involving SUD comorbidity. Even in these instances, most diagnostic categories were marginal predictors of sexual violence, although they tended to be more robust predictors of general violence and any criminal recidivism.

Arguably, some diagnostic entities, such as certain classes of personality disorder, paraphilias, and SUDs either embody criminogenic needs or represent criminogenic needs unto themselves. Substance use pathology represents one of the central eight risk markers for criminal behavior and research examining this domain has found it to be a robust and significant predictor of violence and general criminal recidivism (Olver, Stockdale, & Wormith, 2014). Similarly, paraphilias and ASPD conceptually converge with the well-established sexual offender risk need domains of sexual deviance and antisocial orientation, respectively (see Hanson & Morton-Bourgon, 2005); however, even these diagnoses did not account for significant differences in observed recidivism rates on their own beyond a dynamic risk-need tool for sexual offenders (VRS:SO) to predict sexual violence in the present sample.

SUDs, however, demonstrated a unique association with outcome in the present sample, particularly for general violence and any kind of reoffending upon release. It is worth noting that the sample had a fairly low base rate of NSMD, but a high base rate of personality disorder and SUD. Interestingly, SUD did not covary with VRS:SO posttreatment dynamic score. That is, individuals with or without an SUD bore little relation to their actuarial level of sexual violence risk; however, there was a clear differentiation between the two groups in terms of nonsexual outcomes, and this was additive beyond the VRS:SO. In this context, SUD may have served as a proxy for a general risk variable, given that the VRS:SO contains diverse item content, of which one domain includes general criminality. In sum, the results replicate and extend previous findings to show that NSMDs tend to be weak predictors of future criminal conduct, while SUDs can have an important bearing on such outcomes.

STUDY 2

We attempted to replicate the results obtained in Study 1 in an independent sample of sexual offenders residing in an outpatient mental health clinic that conducts assessments on men and women with problematic sexual behaviors or interests.

METHOD

Participants

Participants were 586 adult men who had been convicted of a contact sexual offense and were assessed just prior to or

just after their court appearance or sentencing between 1982 and 1992. With regard to type of sexual offender, 205 (35%) had offended against an unrelated victim under the age of 16 at the time of offense and 295 (50%) offended against a related child victim (i.e., biological child, step-child, niece, or grandchild). Additionally, 86 (15%) had offended against an unrelated adult female victim. Offenders with mixed victim types were not available in the database. The average age of the sample was 38.1 years ($SD = 12.0$, range: 18 – 78 years) and approximately 11% of the participants reported that they had, at one time, been married or lived in a common-law relationship. The average education level was 10.8 years ($SD = 3.6$ years). Twenty-three percent had previous charges or convictions for sexual offenses, 37% had previous violent (including sexual) offenses, and 53% had prior general offenses. The follow-up period was extended and, as such, some participants were lost to our follow-up as a result of death or deportation from Canada (McCoy, 1997; Wexler, 2005).

Measures

Actuarial Risk Score

The Static-99 (Hanson & Thornton, 1999) is a 10-item static actuarial sex offender risk assessment measure. It is the most widely used sex offender risk tool currently in use and has shown good predictive accuracy (see Hanson & Morton-Bourgon, 2009). In 2009, the Static-99 was revised through adding new age weights to an existing item (Age at Release) to create the Static-99R (Helmus, Hanson, & Thornton, 2009; Helmus, Thornton, Hanson, & Babchishin, 2012). Although the test developers recommend the use of the Static-99R rather than the Static-99, neither measure has shown a material increase in predictive accuracy in studies that have compared these two measures. Given the archival nature of the database and the fact that only aggregate Static-99 scores were available, we used the Static-99 in our analyses.

Diagnosis

Diagnoses were coded as present or not present and were based on current presentation at the time of assessment. The DSM-III (APA, 1980) or DSM-III-R (APA, 1987) were used as these were the diagnostic manuals in use at that time. The types of diagnoses were similar to that described in Study 1, but also included the relatively broad category of any sexual and gender identity disorder (SGID) along with more specific paraphilias: Pedophilia and Sexual Sadism. NSMDs included any Axis I mental health diagnosis that did not also have a co-occurring substance use disorder. In this study, we partitioned substance use from non-substance use disorders because the former is more heavily weighted toward the GPCSL model and general antisocial characteristics (also see Rezansoff et al., 2013). Adjustment

disorders (47%, $n = 62$) and mood disorders (26%, $n = 34$) were two of the more prevalent Axis I disorders included in the NSMD diagnostic group. A smaller proportion of NSMDs included psychotic disorders (5%, $n = 6$). Data were not available for NSMD diagnoses with SUD comorbidity for the present sample, and thus, the current reported base rate of all NSMDs is a conservative estimate. Interrater reliability for these diagnoses was not available as diagnoses were made only by the evaluating psychiatrist.

Recidivism

Recidivism information was obtained in 2002 from a national database of criminal arrests and convictions maintained by the Royal Canadian Mounted Police. The dependent variables (recidivism outcomes) in this study were organized in a nested hierarchical manner, as follows: Sexual recidivism was defined as any charge or conviction for a sexual offense; violent (including sexual) recidivism was defined as any charge or conviction for a nonsexually violent or contact sexual offense; and general recidivism, which included any new criminal charge or conviction.

Procedure

The standard procedure in the Sexual Behaviors Clinic was that each patient was first interviewed by a psychiatrist who, after a couple of sessions, provided a DSM diagnosis (if suitable), in addition to filling out demographic information (e.g., age, education, marital status). The psychiatrist would have access to previous medical charts and police reports which would have included diagnostic history, previous psychological assessment, psychosocial history, and criminal history. These diagnoses were made by experienced psychiatrists whose major clinical work was with sexual offenders. All participants signed an informed consent form at the time of their assessment. This form allowed the use of information obtained from the assessment for research purposes.

Our data analytic plan was identical to that used in Study 1 with one exception. As temporal offending data for specific classes of recidivism were unavailable for Study 2 (e.g., time to new sex offense), we used logistic regression in lieu of Cox regression. Logistic regression, as with Cox regression, involves the prediction of binary criteria, allows for control of important covariates, and also generates a hazard ratio $Exp(\beta)$.

RESULTS

The follow-up period began upon release to the community and ranged up to 20 years, with an average time-at-risk of 9.9 years ($SD = 4.7$ years). The overall rates of recidivism in this study were 16.7% ($n = 98$) for sexual recidivism,

TABLE 4
Static-99[a] Mean Scores by Diagnosis

| Diagnosis | Present Diagnosis | | No Diagnosis | | | |
	N	M(SD)	N	M(SD)	t	d
NSMD	48	1.69 (2.04)	158	2.08 (1.83)	1.27	−0.21
SUD	57	2.26 (1.72)	149	1.89 (1.94)	−1.29	0.20
PD	34	3.24 (1.84)	172	1.74 (1.8)	4.40**	0.83
SGID	174	1.97 (1.88)	32	2.09 (1.92)	0.34	−0.06
Pedophilia	97	2.94 (1.77)	107	1.17 (1.56)	−7.58**	1.06
Sexual Sadism	12	3.50 (1.57)	194	1.90 (1.87)	−2.91*	0.86

Note. SUD = substance use disorder, NSMD = non-substance related mental disorder, PD = personality disorder; SGID Sexual and Gender Identity Disorder.
[a] $n = 206$.
* $p < .01$, ** $p < .001$.

27.5% ($n = 161$) for violent (including sexual) recidivism, and 37.4% ($n = 219$) for general recidivism.

Approximately 97% of offenders in this sample had at least one diagnosis. Among those who were diagnosed, 22.7% ($n = 133$) were diagnosed with an NSMD, 28.3% ($n = 166$) were diagnosed with an SUD, 14.2% ($n = 83$) were diagnosed with PD, and 81.4% ($n = 477$) were diagnosed with an SGID. Within this category and for whom this information was available, 42% (188/445) were diagnosed with Pedophilia and 9% (50/584) were diagnosed with Sexual Sadism.

Table 4 presents the mean scores on the Static-99 for diagnosed and undiagnosed offenders. Given the archival nature of these data, only a portion of individuals had sufficient data in which to include Static-99 scores ($n = 206$). Results indicated that individuals diagnosed with PD obtained higher Static-99 scores than those not diagnosed with PD ($d = .83$), 95% CI [0.45, 1.21]. Moreover, individuals diagnosed with Pedophilia ($d = 1.06$), 95% CI [0.77, 1.36] and Sexual Sadism ($d = 0.86$), 95% CI [0.27, 1.45]

also scored higher on the Static-99 than those not diagnosed with these paraphilias.

The base rates of the three recidivism outcomes among the psychiatric diagnoses are displayed in Table 5. Chi-square analyses indicated that there was a dependent relationship between sexual recidivism and a diagnosis of Pedophilia, χ^2 ($df = 1$, $n = 445$) = 6.15, $p = .013$. The odds of sexual recidivism increased by 81% for offenders diagnosed with Pedophilia compared to those offenders not diagnosed with Pedophilia. Dependent relationships were also observed for diagnoses of Sadism, χ^2 ($df = 1$, $n = 584$) = 4.93, $p = .026$, as well as SUD + Sadism χ^2 ($df = 1$, $n = 584$) = 6.50, $p = .011$. The odds of sexual recidivism increased by 108% for offenders diagnosed with Sadism and by 232% for offenders diagnosed with SUD + Sadism compared to those offenders without those diagnoses.

Dependent relationships were evident between violent recidivism and an SUD, χ^2 ($df = 1$, $n = 586$) = 6.48, $p = .011$; PD, χ^2 ($df = 1$, $n = 586$) = 10.48, $p < .001$; SGID, χ^2 ($df = 1$, $n = 586$) = 4.64, $p = .031$; Pedophilia, χ^2 ($df = 1$, $n = 445$) = 5.45, $p = .020$; Sadism, χ^2 ($df = 1$, $n = 584$) = 4.37, $p = .037$; SUD + Pedophilia, χ^2 ($df = 1$, $n = 445$) = 7.37, $p = .007$; and, SUD + Sadism, χ^2 ($df = 1$, $n = 584$) = 7.40, $p = .007$. The odds of violent recidivism increased by 65% for those with an SUD, 118% for those with a PD, 62% for those with a diagnosis of Pedophilia, 88% for those with Sadism, 125% for those with SUD+Pedophilia, and 245% for those with SUD+Sadism compared to offenders without these diagnoses. Conversely, the odds of violent recidivism decreased by 38% for those with an SGID compared to offenders without these particular diagnoses. The odds of violent recidivism also decreased by 36% for offenders with an NSMD and this effect approached significance at $p = .059$.

Finally, dependent relationships were evident between general recidivism and an SUD, χ^2 ($df = 1$, $n = 586$) = 9.15, $p = .002$; PD, χ^2 ($df = 1$, $n = 586$) = 15.32,

TABLE 5
Frequency (Percentage) of Recidivism Outcomes among Individuals with and without a Diagnosis (SBC Data)

| Diagnostic predictor | Sexual recidivism | | | Violent recidivism | | | General recidivism | | |
	Diagnosis	No diagnosis	OR [95%CI]	Diagnosis	No diagnosis	OR [95%CI]	Diagnosis	No diagnosis	OR [95%CI]
NSMD	12.8	17.9	0.67 [.38, 1.18]	21.1	29.4	0.64 [.40, 1.02]	30.8	39.3	0.69 [.46, 1.04]
SUD	18.7	16.0	1.21 [.76, 1.94]	34.9	24.5	1.65* [1.12, 2.44]	47.0	33.6	1.75** [1.22, 2.53]
PD	20.5	16.1	1.34 [.75, 2.41]	42.2	25.0	2.18*** [1.35, 3.53]	56.6	34.2	2.51*** [1.57, 4.03]
SGID	16.4	18.3	0.87 [.51, 1.50]	25.6	35.8	0.62* [.40, .96]	35.0	47.7	0.59* [.39, .90]
Pedophilia	25.0	15.6	1.81* [1.13, 2.90]	37.2	26.8	1.62* [1.08, 2.42]	47.3	36.6	1.56* [1.06, 2.29]
Sexual Sadism	28.0	15.7	2.08* [1.01, 4.03]	40.0	26.2	1.88* [1.03, 3.41]	52.0	36.0	1.93* [1.08, 3.45]
DD: SUD + Pedophilia	28.0	18.5	1.72 [.88, 3.34]	48.0	29.1	2.25** [1.24, 4.08]	60.0	38.7	2.37** [1.30, 4.33]
DD: SUD + Sadism	38.9	16.1	3.32* [1.25, 8.80]	55.6	26.5	3.45** [1.34, 8.91]	66.7	36.4	3.49* [1.29, 9.43]

Note. NSMD = non-substance related mental disorder, SUD = substance use disorder, PD = personality disorder; SGID = sexual and gender identity disorder; DD = dual diagnosis (SUD comorbidity). OR = odds ratio. Some variability in sample sizes for diagnosed and non-diagnosed offenders due to missing data. $N = 584$-586.
* $p < .05$, ** $p < .01$, *** $p < .001$.

$p < .001$; SGID, χ^2 ($df = 1$, $n = 586$) $= 6.11$, $p = .013$; Pedophilia, χ^2 ($df = 1$, $n = 445$) $= 5.20$, $p = .023$; Sexual Sadism, χ^2 ($df = 1$, $n = 584$) $= 5.03$, $p = .025$; SUD + Pedophilia, χ^2 ($df = 1$, $n = 445$) $= 8.29$, $p = .009$; and, SUD + Sadism, χ^2 ($df = 1$, $n = 584$) $= 6.83$, $p < .001$. The odds of general recidivism increased by 75% for those with an SUD, 151% for those with a PD, 56% for those with a diagnosis of Pedophilia, 93% for those with a diagnosis of Sadism, 137% for those with an SUD+Pedophilia diagnosis, and 249% for those with an SUD+Sadism, compared to those without that particular diagnosis. Conversely, the odds of general recidivism decreased by 41% for those with a SGID compared to offenders without a diagnosis of SGID. The odds of general recidivism also decreased by 31% for offenders with a NSMD diagnoses and this effect approached significance at $p = .076$.

Similar to Study 1, a series of binary logistic regression analyses were used to examine the unique contribution of each diagnostic category after controlling for sexual violence risk score (in this case, the covariate was Static-99). The dependent variables were sexual, violent (including sexual) and general recidivism. Results are displayed in Table 6.

With regard to sexual recidivism, the Static-99 was significantly related to outcome across all regression models (1-8). Across these sets of analyses, a one unit increase in the Static-99 score increased the hazard rate by 52% to 57%, depending on the model, while the presence of Sexual Sadism increased the hazard rate by 323% (model 6). None of the other diagnostic predictors, including the presence of NSMD, added to the predictive equation.

In terms of violent recidivism, both the Static-99 and the presence of an SUD or Sexual Sadism were significantly related to outcome when entered into a binary prediction model (i.e., models 2 and 6, respectively). A one unit increase in Static-99 score increased the hazard rate by 38% to 45% across analyses, whereas the presence of SUD increased the hazard rate by 140%, and the presence of Sexual Sadism increased the hazard rate by 377%. None of the other diagnostic predictors or the presence of NSMD added to the predictive equation.

Static-99 scores were significantly associated with general recidivism across all models. A diagnosis of SUD predicted outcome in tandem with the Static-99 (model 2), but not when entered with other diagnostic predictors. A one unit increase in the Static-99 increased the hazard rate by 51% to 61% across analyses. As with previous analyses, the presence of NSMD did not add to the predictive equation, nor did any of the other diagnostic predictors.

Discussion

Study 2 was conducted to examine the relationship between mental disorders and recidivism and to replicate the findings observed in Study 1 in a sample of sexual offenders attending an outpatient mental health hospital. Consistent with Study 1, the vast majority of the sample (97%) had at least one mental health diagnosis, many of whom were diagnosed with a SGID. The high rates of SGID were unexpected, although are likely due, in part, to the broad nature of this category of diagnoses (e.g., sexual dysfunctions, paraphilias, gender identity disorders) and to the

TABLE 6
Logistic Regression Analyses: Incremental Validity of Diagnoses in the Prediction of Recidivism Criteria (SBC Data)

Regression model (1-8)	Sexual recidivism							Violent recidivism							General recidivism						
						95% CI							95% CI							95% CI	
	B	SE	Wald	p	e^B	LL	UL	B	SE	Wald	p	e^B	LL	UL	B	SE	Wald	p	e^B	LL	UL
1 Static-99	.45	.10	20.42	**<.001**	1.57	1.29	1.91	.35	.09	16.65	**<.001**	1.42	1.20	1.69	.45	.09	24.09	**<.001**	1.56	1.31	1.87
NSMD	−.63	.52	1.49	.222	0.53	0.19	1.46	−.53	.40	1.74	.188	0.59	0.27	1.30	−.04	.37	0.01	.926	0.97	0.47	2.00
2 Static-99	.45	.10	20.50	**<.001**	1.57	1.29	1.91	.35	.09	16.44	**<.001**	1.42	1.20	1.68	.44	.09	23.30	**<.001**	1.55	1.30	1.85
SUD	.66	.39	2.78	.096	1.93	0.89	4.18	.88	.34	6.66	**.010**	2.40	1.23	4.66	.68	.34	4.08	**.043**	1.98	1.02	3.84
3 Static-99	.44	.10	19.12	**<.001**	1.55	1.27	1.89	.32	.09	13.18	**<.001**	1.38	1.16	1.64	.41	.09	19.42	**<.001**	1.51	1.26	1.81
PD	.28	.46	0.37	.544	1.32	0.54	3.27	.65	.41	2.46	.117	1.91	0.85	4.26	.67	.43	2.48	.116	1.96	0.85	4.52
4 Static-99	.45	.10	20.77	**<.001**	1.57	1.30	1.91	.36	.09	17.08	**<.001**	1.43	1.21	1.69	.45	.09	24.11	**<.001**	1.56	1.31	1.87
SGID	.12	.53	0.05	.818	1.13	0.40	3.17	−.65	.42	2.37	.123	0.53	0.23	1.19	−.48	.42	1.31	.253	0.62	0.27	1.41
5 Static-99	.43	.11	16.61	**<.001**	1.54	1.25	1.90	.37	.10	15.17	**<.001**	1.45	1.20	1.75	.47	.10	21.42	**<.001**	1.61	1.31	1.96
Pedophilia	.19	.41	0.22	.642	1.21	0.54	2.72	−.12	.35	0.11	.736	0.89	0.45	1.76	−.20	.35	0.32	.569	0.82	0.42	1.62
6 Static-99	.42	.10	17.68	**<.001**	1.52	1.25	1.84	.32	.09	13.95	**<.001**	1.38	1.17	1.64	.42	.09	21.46	**<.001**	1.53	1.28	1.83
Sadism	1.44	.65	4.91	**.027**	4.23	1.18	15.12	1.56	.71	4.85	**.028**	4.77	1.19	19.13	.99	.72	1.87	.171	2.69	0.65	11.13
7 Static-99	.45	.10	19.87	**<.001**	1.56	1.28	1.90	.35	.09	16.01	**<.001**	1.41	1.19	1.67	.44	.09	22.85	**<.001**	1.54	1.29	1.85
DD: SUD + Pedophilia	.66	.46	2.04	.153	1.93	0.78	4.75	.65	.41	2.45	.118	1.91	0.85	4.28	.60	.42	2.07	.151	1.83	0.80	4.16
8 Static-99	.44	.10	19.94	**<.001**	1.56	1.28	1.89	.35	.09	16.58	**<.001**	1.42	1.20	1.68	.45	.09	24.05	**<.001**	1.56	1.31	1.87
DD: SUD + Sadism	1.49	.85	3.09	.079	4.43	0.84	23.29	1.46	.89	2.68	.102	4.29	0.75	24.59	.96	.92	1.09	.296	2.60	0.43	15.62

Note. $N = 204$. NSMD = non-substance related mental disorder, SUD = substance use disorder, PD = personality disorder, SGID = sexual and gender identity disorder, DD = dual diagnosis (SUD comorbidity). Significant p-values in bold font.

specialized nature of the clinic. Again, such rates are not reflective of general offenders but characterize a selected sample of sexual offenders within a forensic psychiatric setting that specializes in the treatment of sexual behavior problems.

Consistent with Study 1, NSMDs did not predict recidivism outcomes either on their own or after controlling for actuarial risk. In univariate analyses, few of the diagnostic variables predicted sexual violence with the exception of Sexual Sadism, while several of these variables, including SUDs, PDs, the paraphilia categories examined, and dual diagnoses of paraphilias with SUD predicted broader base rate outcomes, such as criminal recidivism. After controlling for Static-99 score, few of these diagnoses predicted any outcome, save for a few interesting exceptions. This reflects the high degree of shared variance between some of these categories with a risk assessment tool such as the Static-99, explaining the higher scores observed in most groups that were positive for a given diagnosis (except for SGIDs and NSMDs). Thus, although some of these diagnostic entities have risk variance, there is little beyond that already captured by the Static-99 and they tend to offer little incrementally, at least from a pure prediction perspective.

One interesting exception was Sexual Sadism, which provided additional predictive information beyond the Static-99, which likely captures in part the prominent risk-need domain of sexual deviance from the broader extant literature as a salient marker of risk for sexual violence (Hanson & Morton-Bourgon, 2005). The other interesting exception among the specific diagnoses that failed to predict outcome after controlling for static risk was SUD diagnosis. As with Study 1, this broad diagnosis uniquely predicted violent and general recidivism. We suspect that similar mechanisms could be at work, whereby SUDs overlap with the broader risk-need domain of antisocial orientation, thus demonstrating incremental value beyond a static tool in the prediction of higher base rate (and mostly nonsexual) outcomes.

General Discussion

The importance of mental illness as a risk factor for violence has been debated for some time. A number of studies have shown that severe mental illness, particularly schizophrenia and other psychotic disorders are associated with crime. Such studies have been used to support specific policy recommendations and the initiation of diversion programs (e.g., mental health courts) that are intended to treat mental illness so that the likelihood of recidivism is reduced. Although diversion programs have been successful in reducing the rates of incarceration and increasing general access to mental health services, the ability of these programs to reduce recidivism has been mixed, at best. The evidence for mental health courts is particularly weak for

those programs weighted more heavily toward mental health models, as opposed to criminal justice–based models (Sirotich, 2009; Skeem et al., 2011). Skeem and colleagues further noted that symptom change evident within these programs was not associated with changes in recidivism.

In offender samples, meta-analytic reviews have shown that mental illness is not a significant predictor of violence (Bonta et al., 1998, 2013). This finding has been replicated in sexual offenders (Hanson & Morton-Bourgon, 2007), although as noted earlier, there was one earlier study with an unselected sample (Långström et al., 2004) that showed mental illness to be an important predictor of recidivism. The results of the present investigation, which were conducted in two distinct samples of forensic and correctional offenders, were consistent with the notion that mental illness is not a predictor of recidivism and that relevant predictors are consistent with those identified in the general correctional literature.

Andrews and Bonta (1994) identified several factors to be predictive of recidivism in general offenders and factors specific to sexual offenders have similarly been identified (Hanson & Morton-Bourgon, 2005). Addressing these dynamic risk factors or criminogenic needs is an important component of treatment programs that adhere to the principles of effective correctional intervention (i.e., risk, need, responsivity; see Andrews & Bonta, 2010). A number of programs based on the principles of risk, need, and responsivity have been developed and applied to general offenders (Cullen et al., 2012) and sexual offenders (Kingston, Yates, & Olver, in press) with some degree of empirical support (Hanson, Bourgon, Helmus, & Hodgson, 2009; Hanson et al., 2002). As implied by previous discussion pertaining specifically to Studies 1 and 2, it is our sense that some diagnoses contain or embody dynamic risk factors (or overlap with dynamic risk factors), which may be why they contribute to the prediction of recidivism outcomes. Given a comprehensive measure of sexual violence risk that assesses static and dynamic domains, diagnostic information may be immaterial from a risk and need standpoint, although may be an important responsivity consideration (e.g., therapeutically engaging difficult populations, such as severe PD, in order to benefit from services). A viable direction for future research may be to examine what, if any, added value diagnoses have beyond comprehensive controls of risk and need across samples, with an examination of the responsivity implications therein.

Although the present study had several strengths, such as the long follow-up period and the inclusion of a number of different DSM diagnoses that were applied in two distinct settings, there were a number of limitations that need to be taken into account. One limitation is that interrater reliability of these diagnoses was not available. Indeed, there is accumulating evidence of specific problems with the reliability of some diagnoses, particularly among the paraphilias (Kingston, Firestone, Moulden, & Bradford, 2007;

Kingston, Seto, Firestone, & Bradford, 2010). Additionally, we were unable to determine whether an individual was in an acute phase of their illness (i.e., exhibited symptoms of their diagnosed mental disorder) at the time of reoffense. As we were unable to control for the phase of an individual's illness at the time of recidivism, it is a potentially confounding variable. Perhaps mental illness is best conceptualized as an acute dynamic risk factor, such that certain active symptoms of mental illness may play a role in the timing of a criminal offense. A further potential limitation is that the requisite information to convert Static-99 ratings to Static-99R was not available for Study 2. Having Static-99R would have provided an added measure of currency to the present study and more direct extension to other jurisdictions that have switched over to this version of the tool. This, in our view, is partly offset by the close correspondence of the tools and that the findings reflected an important common principle; that few diagnostic categories provided unique incremental information beyond this tool in the prediction of various recidivism outcomes.

Moreover, the large number of diagnostic categories examined presents both strengths and possible limitations. There were a large number of analyses given that there were several diagnostic categories and three recidivism outcomes; thus we examined the associations of all variables out of scholarly interest, for full transparency in reporting findings, and to aid meta-analytic aggregation. We did not impose formal statistical controls for familywise Type I error (e.g., such as Bonferroni correction), however, as we were concerned about Type II error inflation. In the most extreme instance, even if Table 5 (Study 2) was corrected only at the level of a given outcome variable (i.e., .05/8 diagnostic categories = .006 to keep the family of analyses at alpha), 15 out of 17 findings with a p-value $< .05$ (from 24 analyses executed) would be ruled non-significant. Given that we drew on the existing literature to advance predictions about which variables were likely (and unlikely) to be associated with recidivism and exercised caution in the interpretation of findings, partly redresses this concern, although we concede the possibility remains that there were some possible Type I errors committed in light of the large number of analyses we conducted.

Further, despite the inclusion of several important diagnoses, many diagnostic categories were broad and included several different specific disorders that may be differentially associated with recidivism. As noted earlier, it is conceivable that individuals exhibiting positive symptoms of Schizophrenia, for example, may evidence a different offense trajectory than individuals with a major depression, although even the importance of positive symptoms has been questioned (e.g., Appelbaum et al., 2000). In Study 2, 13 offenders met criteria for Schizophrenia or another psychotic disorder. The trend in our data was consistent with our general findings, however, such that individuals without a diagnosis of schizophrenia were more likely to reoffend than individuals with that diagnosis. It will be important for future research to incorporate large samples with a range of diagnoses that could be examined with respect to outcome.

Recently, Skeem and colleagues hypothesized that the effect of mental illness on criminal behavior reflects moderated mediation, whereby a small minority of mentally disordered offenders (they suggest about 10%) are directly influenced to commit criminal activity as a result of their active symptoms of mental illness. For the remaining 90% of mentally disordered offenders, the relationship between mental illness and crime is mediated by more general risk factors and thus is more consistent with the GPCSL model. Future research should test this theory and particularly the relevant moderating factors that differentiate between these two proposed pathways.

Finally, despite the fact that mental illness is not a reliable predictor of recidivism, such diagnoses may be best conceptualized as a responsivity factor as noted above, such that some individuals with active symptoms of mental illness may find it difficult to engage in treatment or attend to the treatment content. Therefore, targeting such symptoms may be an important first step in the treatment process. In turn, addressing mental health symptoms may help to promote improvement on an individual's identified criminogenic needs. For example, managing mental health symptoms may allow one to make more adequate use of leisure time, resisting urges to turn to substance use to manage symptoms, and to obtain employment, all of which have been shown to reduce the likelihood of recidivism.

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