

Expanding the Early and Late Starter Model of Criminal Justice Involvement for Forensic Mental Health Clients

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The early and late starter model provides one of the most enduring frameworks for understanding the developmental course and severity of violence and criminality among individuals with severe mental illness. We expanded the model to account for differences in the age of onset of criminal behavior and added a group with no prior contact with the justice or mental health systems. We sampled 1,800 men and women found Not Criminally Responsible on account of Mental Disorder in 3 Canadian provinces. Using a retrospective file-based study, we explored differences in criminal, health, demographic, and social functioning characteristics, processing through the forensic psychiatric system and recidivism outcomes of 5 groups. We replicated prior research, finding more typical criminogenic needs among those with early onset crime. Those with crime onset after mental illness were more likely to show fewer criminogenic needs and to have better outcomes upon release than those who had crime onset during adulthood, before mental illness. Individuals with no prior contact with mental health or criminal justice had higher functioning prior to their crime and had a lower risk of reoffending. Given little information is needed to identify the groups, computing the distribution of these groups within forensic mental health services or across services can provide estimates of potential intensity or duration of services that might be needed. This study suggests that distinguishing subgroups of forensic clients based on the sequence of onset of mental illness and criminal behavior and on the age of onset of criminal behavior may be useful to identify criminogenic needs and predict outcomes upon release. This updated framework can be useful for planning organization of services, understanding case mix, as well as patient flow in forensic services and flow of mentally disordered offenders in correctional services.

Keywords: typology, recidivism, violence, criminality, mental illness

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The criminal justice system has become a common gateway to mental health care for individuals with serious mental illness (SMI; Gray, Shone, & Liddle, 2000). Both forensic and civil psychiatric services provide care to growing numbers of individuals with SMI who have come into conflict with the law (Jansman-Hart, Seto, Crocker, Nicholls, & Côté, 2011). With this increase comes a much more heterogeneous population of mentally ill individuals (Crocker, Charette, et al., 2015; Latimer & Lawrence, 2006; Schanda, Stompe, & Ortwein-Swoboda, 2009; Simpson et al., 2014) who are stigmatized with combined psychiatric and forensic labels. The variability in mental health and criminogenic needs in this evolving population has direct implications for the organization of services in terms of intensity and breadth of services, resource allocation, as well as safety and security of patients, care providers and the community. For instance, Simpson et al. (2014) recently demonstrated that the proportion of individuals with exclusively psychotic disorders is decreasing in forensic services, whereas the number of individuals being admitted with concurrent substance use disorders and/or personality disorders is increasing.

The early and late starter model is one of the earliest and most enduring for understanding criminality among individuals with SMI (Hodgins, 2008; Hodgins & Janson, 2002). Studies examined principally offenders with schizophrenia and other psychotic spectrum disorders (Jones, Van den Bree, Ferriter, & Taylor, 2010; Kooyman et al., 2012; Laajasalo & Hakkanen, 2005; Pedersen, Rasmussen, Elsass, & Hougaard, 2010; Simpson, Grimbo, Chan, & Penney, 2015; Tengström, Hodgins, & Kullgren, 2001; Van Dongen, Buck, & Van Marle, 2014), and some studies included individuals with major depression and bipolar disorder (Hodgins, Cree, Alderton, & Mak, 2008; Mathieu & Côté, 2009; Sanchez-SanSegundo, Ferrer-Cascales, Herranz-Bellido, Pastor-Bravo, & Hodgins, 2014; Sirotych, 2009). In the most recent version of the model, Hodgins (2008) posited three trajectories: (a) individuals who exhibit antisocial behavior during adolescence, usually prior to mental illness onset, and persist into adulthood; (b) individuals who first exhibit antisocial behavior in adulthood, after the onset of their mental illness; and (c) individuals who suddenly engage in serious violence, later in life, sometimes many years after the onset of mental illness. This revised model divided the late starter group, originally defined as people for whom the onset of the criminal behavior occurs after the onset of mental illness, into two groups: individuals with an atypical onset of criminal activity in mid- or late-life and those whose criminality began during the more typical periods of adolescence or early adulthood. This new group accounts for the important distinction in terms of typical versus atypical timing of onset of criminal behavior. However, to date there has been little consideration of atypical onset of mental illness. It is suggested that roughly half of mental disorders have their onset by the end of adolescence and three quarters by the midtwenties (Kessler et al., 2007). However, the current early starter group as described earlier focuses only on those with criminality during adolescence, with no mention of those whose criminality begins in adulthood but preceding an atypically late onset (or detection) of mental illness. These distinctions may be particularly important from a systems perspective (i.e., there are typically separate youth and adult health and justice systems). There may also be important differences in the needs and pathways to crim-

inality between these groups that are masked when assuming that all early starters are a homogenous group.

The early and late starter model suggests that mental illness may be an important risk factor for criminality for those individuals whose criminality occurs around or after the onset of mental illness. For individuals whose criminal onset precedes the illness, traditional criminogenic factors such as substance abuse or criminal associates are thought to be more important than clinical factors (Bonta, Blais, & Wilson, 2014; Skeem, Winter, Kennealy, Loudon, & Tatar, 2014). Studies have found that people in the early starter trajectory display more violent behavior, more versatile criminal behavior, are more likely to have substance use problems, and have higher scores on psychopathy and antisocial personality scales compared with those who fall in the late starter trajectory (Crocker et al., 2005; Fulwiler & Ruthazer, 1999; Hodgins, 2008; Hodgins, Côté, & Toupin, 1998; Jones et al., 2010; Mathieu & Côté, 2009; Mueser et al., 2006; Simpson et al., 2015; Van Dongen, Buck, Barendregt, et al., 2015; Van Dongen, Buck, & Van Marle, 2015). Many authors have continued to hypothesize that symptoms of mental illness would be more important drivers of violence among late compared with early starters, despite variability observed across studies (Kooyman et al., 2012; Laajasalo & Hakkanen, 2005; Tengström et al., 2001; Van Dongen, Buck, Barendregt, et al., 2015; Van Dongen et al., 2014; Van Dongen, Buck, & Van Marle, 2015). The early and late starter model can help define subgroups of individuals differing in etiologies, needs, and risk for future mental health and criminal justice involvement. Our forensic mental health systems cannot respond with a “one-size-fits-all” approach.

According to the Risk Needs Responsivity model (RNR; Bonta & Andrews, 2007), interventions are more effective when they are matched to the level of risk (*Risk Principle*), with higher-intensity interventions for higher-risk persons; low-intensity interventions for high-risk individuals are inadequate, whereas high-intensity interventions for low-risk individuals are inefficient or may even have unintended negative effects (Latessa, 2014). In keeping with the *Need Principle*, interventions are more effective when they target changeable or dynamic factors associated with the likelihood of new offenses (i.e., criminogenic needs). Applying the RNR framework would suggest that different needs are important for early versus late starter groups.

While there has been empirical support for the early and late starter model, past research has mostly focused on individuals with psychotic spectrum disorders. Studies of Hodgins' (2008) model also have often focused on specific index offenses (e.g., homicide; Laajasalo & Hakkanen, 2005), and sampled either entirely men (Mathieu & Côté, 2009; Sanchez-SanSegundo et al., 2014; Tengström et al., 2001) or very small numbers of women (Laajasalo & Hakkanen, 2005; Simpson et al., 2015). Circumstances immediately prior to the offense and mental health outcomes such as rehospitalization and self-harming behavior generally have not been reported. Consideration of a wider range of factors at the time of offending, of dynamic factors that can change over time and that could be targets for intervention, and a wider range of outcomes in a representative sample of the modern forensic population are needed to offer new insights on the relevance and utility of the early and late starter model.

Aim of the Study

We sought to expand the testing of the early and late starter model to explore its utility across the full spectrum of severe mental disorders found in the forensic population, including schizophrenia, other psychotic disorders, major depression, and bipolar disorder. Our specific objective was to compare different starter groups according to their onset of criminality and mental illness on their sociodemographic, mental health and criminological characteristics, as well as their pathways through the forensic system: (a) We hypothesized that postillness (late) starters would have less severe and less complex psychosocial (defined as high school completion, relationship status, income status, and homelessness), mental health (defined as primary and comorbid diagnoses, as well as prior psychiatric hospitalizations), and criminal justice histories (defined as prior charges and criminal diversity) than preillness (early) starters. (b) Given the legal criteria for a Not Criminally Responsible on account of mental disorder (NCRMD) finding, groups were not expected to differ in terms of symptoms at the time of the index offense, but we expected postillness (late) starters to be more likely to victimize a family member based on prior research (Laajasalo & Hakkanen, 2005; Sanchez-SanSegundo et al., 2014; Simpson et al., 2015; Sirotych, 2009).¹ (c) Given their less complex psychosocial, mental health, and criminal justice histories, we anticipated that the postillness (late) starters would have a shorter trajectory through the Review Board system than preillness (early) starters (i.e., would be released from detention and absolutely discharged sooner). Similarly, when compared with the preillness (early) starters, the postillness (late) starters were expected to experience more successful community reintegration in terms of criminal outcomes (such as recidivism).

Method

Data from this study were extracted from the National Trajectory Project (NTP; Crocker, Nicholls, et al., 2015). The NTP is a longitudinal study of individuals found NCRMD in the three largest provinces of Canada—Québec, Ontario, and British Columbia. Persons found NCRMD fall under the jurisdiction of a provincial or territorial Review Board, a type of mental health tribunal that determines the person's disposition (detention in hospital, detention with conditions, conditional discharge to the community, or absolute discharge). Unless there are exceptional circumstances, Review Boards hold a minimum of annual hearings for each NCRMD accused.

Sample and Procedures

The sample included 1,800 adults found NCRMD between 2000 and 2005. Men represented 84.4% of our sample, which was aged 36.6 years old on average. About half of the sample had completed high school, and less than a quarter were in a relationship at the time of the offense. The most common diagnosis was a psychotic spectrum disorder, but mood disorders (three quarters of which were bipolar disorder) comprised nearly a quarter of all primary diagnoses. The full population of people found NCRMD is represented for Ontario and British Columbia, whereas a sample of people was randomly selected for Quebec, stratified by region. Normalized weights were applied to account for this.

We initially applied Hodgins' (2008) three-group model. It became apparent that there was a distinct group of individuals for whom there was no prior mental health nor criminal justice involvement before the index NCRMD verdict, so age of onset of mental illness and age of onset of criminal justice involvement could not be confirmed from archival administrative data. Second, to investigate the need to further refine the categorization of early starters, we split the group of those whose criminality preceded their first contact with mental health services based on whether onset of criminality was during adolescence or adulthood. Thus, our application of the model included five groups (Table 1), based on two dimensions: (a) the sequence of onset of mental illness and criminal behavior, and (b) the age of onset of criminal behavior. We used the age at the first contact with mental health services (either a psychiatric consultation or a psychiatric hospitalization) as a proxy for mental illness onset and the age at the first criminal charge as a proxy for criminal behavior onset. Based on the first dimension (i.e., sequence of onset), we identified two groups, which we further split based on the age of onset of criminal behavior (Table 1). Preillness starters (traditionally labeled "early starters") had a first criminal charge before their first contact with mental health services. They were divided into *adolescent preillness starters* (criminal onset before 18 years old; $n = 173$) and *adult preillness starters* (criminal onset at 18 years old or older; $n = 406$). Postillness starters (traditionally labeled "late starters") had a first criminal charge after their first contact with mental health services. They were divided into *younger postillness starters* (criminal onset before 35 years old; $n = 621$) and *older postillness starters* (criminal onset at 35 years old or older; $n = 323$). Thirty-five was used as a cut-off age to distinguish later onset mental illness, and to ensure consistency across studies that used the same or similar cut-off age (Simpson et al., 2015; Van Dongen et al., 2014). It also aligns with Hodgins' three-group model, which described the third group as being in their late thirties (Hodgins, 2008). Finally, we labeled those whose NCRMD verdict was the first formal contact with both the mental health and criminal justice system as *first presenters* ($n = 278$), regardless of their age.

Review Board files were used to extract demographic (e.g., sex, age, aboriginal status, civil status, employment and housing status at time of index offense), clinical (e.g., age at first psychiatric hospitalization or consultation, number of prior psychiatric hospitalizations, symptoms at the time of the offense, diagnoses [primary diagnoses were divided into three groups: psychotic spectrum disorder, mood spectrum disorder, and other; comorbid substance use disorders and personality disorders were coded separately], symptoms and behavior throughout the purview of Review Boards) and administrative information (e.g., whether the first Review Board disposition was to detain or discharge the individual, and whether the individual was absolutely discharged or released from detention by the end of the follow-up). Criminal records were obtained from the Fingerprint Service of the Royal Canadian Mounted Police. Criminal offenses leading to an

¹ In Canada, a person who is found to be "suffering from a mental disorder that rendered the person incapable of appreciating the nature and quality of the act or omission or of knowing that it was wrong" at the time of the offense may be found not criminally responsible (R.S.C., 1984, c. C-46, s. 16(1)).

Table 1
Composition of the Five Groups by Age at First Criminal Behavior and Sequence With Mental Disorder

Sequence with mental illness (MI)	Age of criminal behavior onset				
	Younger than 18	18 or older	Younger than 35	35 or older	Any age
Criminal behavior before MI (i.e., traditional early starters)	Adolescent preillness starters (<i>n</i> = 173; 10%)	Adult preillness starters (<i>n</i> = 406; 23%)			
Criminal behavior after MI (i.e., traditional late starters)			Younger postillness starters (<i>n</i> = 621; 34%)	Older postillness starters (<i>n</i> = 323; 18%)	
Criminal behavior and MI simultaneously					First presenters (<i>n</i> = 278; 15%)

Note. The age at the first criminal charge was used as a proxy for age of criminal behavior onset, and the age at the first contact with mental health services was used as a proxy for the age of mental illness onset. Total does not add up to 1,800 owing to weighting of data.

NCRMD verdict are not systematically available in Canadian criminal records, so this information was also collected from the Review Board files. For the purpose of the current analyses, offenses were collapsed into four major categories: offenses against the person (e.g., homicide, sexual assault, assault, weapon-related offenses), property (e.g., theft, arson), administrative (e.g., breaching conditions of release, failure to appear in court), and other offenses (e.g., possession or trafficking of drugs, disturbing the peace, traffic violations, gambling, prostitution).

Outcomes following the NCRMD index verdict were considered within the following time frames: events between annual Review Board hearings (i.e., violent behaviors, substance use, failure to comply with release conditions, medication noncompliance, suicidal behavior, and rehospitalization), time until release from detention, time until absolute discharge, and time until first recidivism (i.e., a new criminal conviction or NCRMD finding after the index NCRMD finding, until the end of the study, with a follow-up time ranging from 3 to 8 years). These outcomes were coded from criminal records and Review Board files.

Ethics

The research protocol was approved by appropriate institutional ethics review committees (Douglas Mental Health Research Institute, Institut Philippe-Pinel de Montréal, University of British Columbia, Forensic Psychiatric Services Commission, Royal Ottawa Health Care Group).

Analytic Approach

As a first step, we computed weighted descriptive statistics. We then computed logistic (binomial or multinomial), negative binomial, and Cox regressions. Younger postillness starters were chosen as the reference category because they were the largest group and therefore most typical of the NCRMD sample. Negative binomial regressions were computed to estimate the risk ratios of behaviors between Review Board hearings (Zou, 2004) and incidence rate ratios of prior charges, types of criminal offenses for those with at least one prior charge (as a proxy for criminal diversity), and prior psychiatric hospitalizations. We controlled for unequal time at risk of the various outcomes by using age as an offset for historical outcomes and follow-up time for prospective outcome. Cox regressions were computed to examine time spent

from NCRMD verdict to absolute discharge, time until release from detention, and to estimate the time until the first recidivism event from the time of the index verdict. Status under Review Board (under Review Board mandate or no longer under Review Board mandate, i.e., absolutely discharged) was included as a time-varying covariate in the latter. Multinomial logistic regressions were used for primary diagnosis, most severe index offense, and first Review Board disposition. Binomial logistic regressions were used for everything else. Given that our previous work showed interprovincial differences in reoffending rates (Charette et al., 2015) and higher social functioning as well as less severe criminal histories among women (Nicholls et al., 2015), all regressions controlled for gender and province as covariates. We also controlled for time to release from detention as a covariate for the model estimating the risk ratios of behaviors between Review Board hearings.

Results

Psychosocial, Mental Health, and Criminal Justice Histories

Our primary objective was to compare diverse groups of patients found NCRMD according to the onset of criminal behavior and mental illness on their sociodemographic, mental health and criminological characteristics, as well as their pathways through the forensic system. Our first hypothesis that postillness (late) starters would have less severe and less complex psychosocial, mental health, and criminal justice histories than preillness (early) starters was generally supported. Table 2 describes the five groups on psychosocial, mental health and criminal justice histories, and Table 3 displays the point estimates and confidence intervals from the adjusted models.

Adolescent preillness starters had 0.3 times the odds of high school completion compared with younger postillness starters. They had similar primary diagnoses, but had 63% increased odds of having a comorbid substance use disorder and two times the odds of having a comorbid personality disorder or traits. They had a lower rate of prior psychiatric hospitalization per year lived, but over three times the rate of prior charges compared with younger postillness starters. Among those with at least one prior charge, adolescent preillness starters displayed greater criminal diversity than younger postillness starters.

Table 2
Psychosocial, Mental Health, and Criminal Justice Histories at Time of Index Verdict by Group

Variable	Adolescent preillness starters (n = 173)	Adult preillness starters (n = 406)	Younger postillness starters (n = 621)	Older postillness starters (n = 323)	First presenters (n = 278)	Total (n = 1,800)
Women	4%	3%	12%	30%	19%	16%
Age	32.31	40.56	29.19	47.39	37.32	36.56
Aboriginal	4%	3%	4%	1%	3%	3%
High school diploma	23%	48%	49%	62%	55%	49%
In a relationship	11%	17%	9%	25%	25%	16%
Earning income	11%	17%	9%	13%	37%	16%
Homeless	12%	11%	10%	7%	5%	9%
Primary diagnosis						
Psychotic spectrum disorder	79%	72%	74%	66%	63%	71%
Mood spectrum disorder	16%	21%	21%	31%	27%	23%
Others	5%	8%	4%	3%	10%	6%
Comorbid diagnoses						
Substance use disorder	46%	35%	33%	20%	21%	31%
Personality disorder	18%	13%	10%	7%	9%	11%
Number of prior psychiatric hospitalizations (mean)	3.67	2.56	5.03	4.87	NA	3.78
Number of prior charges (mean)	17.70	9.63	4.97	.80	NA	5.71
Criminal diversity—types of prior charges (max 4)	3.21	2.49	2.49	1.65	NA	2.55

Note. NA (not applicable) indicates that the variable is not applicable as the first presenters have no formal contact with the mental health services or the criminal justice system prior to the index offense.

Adult preillness starters had two times the odds of being in a relationship and of earning an income at the time of the index offense compared with younger postillness starters. There were few differences in terms of diagnoses, with the exception that the relative odds of having “other” primary diagnoses rather than psychotic spectrum disorder were 85% higher in adult preillness starters than in younger postillness starters. Similar to adolescent preillness starters, adult preillness starters had under half the rate of prior psychiatric hospitalization, but an in-

creased rate of prior charges compared with younger postillness starters. However, they displayed lower criminal diversity.

Older postillness starters had three times the odds of being in a relationship compared with younger postillness starters. The relative odds of having a primary diagnosis of mood spectrum disorder rather than psychotic spectrum disorder were over 50% higher in this group than in younger postillness starters. They also had half the odds of having a comorbid substance use disorder and of having a comorbid personality disorder or traits. They had lower

Table 3
Comparison of Psychosocial, Mental Health and Criminal Justice Histories, Using Younger Postillness Starters as Reference Category

Variable	Adolescent preillness starters (n = 173)	Adult preillness starters (n = 406)	Older postillness starters (n = 323)	First presenters (n = 278)
Aboriginal (OR)	1.03 (.41, 2.34)	.79 (.35, 1.64)	.34 (.11, .87)	.76 (.30, 1.71)
High school diploma (OR)	.30 (.19, .47)	.96 (.71, 1.30)	1.55 (1.11, 2.17)	1.21 (.86, 1.70)
In a relationship (OR)	1.24 (.68, 2.17)	2.05 (1.38, 3.06)	2.98 (2.02, 4.42)	3.32 (2.21, 5.00)
Earning income (OR)	1.24 (.65, 2.27)	2.14 (1.39, 3.32)	1.55 (.95, 2.51)	6.15 (4.02, 9.52)
Homeless (OR)	1.20 (.65, 2.13)	1.07 (.68, 1.66)	.73 (.42, 1.24)	.51 (.26, .92)
Primary diagnosis (relative OR, reference: psychotic)				
Mood spectrum disorder	.78 (.49, 1.23)	.96 (.70, 1.31)	1.57 (1.15, 2.16)	1.36 (.97, 1.92)
Others	1.15 (.53, 2.51)	1.85 (1.08, 3.15)	.87 (.42, 1.81)	2.66 (1.51, 4.67)
Comorbid diagnoses				
Substance use disorder (OR)	1.63 (1.15, 2.30)	1.14 (.88, 1.49)	.51 (.37, .71)	.56 (.39, .78)
Personality disorder or traits (OR)	2.03 (1.25, 3.24)	1.29 (.87, 1.92)	.57 (.33, .94)	.79 (.47, 1.29)
Number of prior psychiatric hospitalizations (IRR)	.66 (.54, .81)	.40 (.34, .47)	.62 (.54, .72)	NA
Number of prior charges (IRR)	3.31 (2.65, 4.16)	1.63 (1.37, 1.94)	.12 (.10, .15)	NA
Criminal diversity—types of prior charges (max 4; IRR)	1.29 (1.16, 1.44)	.81 (.74, .88)	.44 (.36, .53)	NA

Note. OR = odds ratio; IRR = incidence rate ratio. NA (not applicable) indicates that the variable is not applicable as the first presenters have no formal contact with the mental health services or the criminal justice system prior to the index offense. We performed negative binomial regressions for prior psychiatric hospitalizations, prior charges, and criminal diversity, a multinomial logistic regression for primary diagnosis, and binomial logistic regressions for remaining variables, controlling for gender and province. We present ratios with 95% confidence intervals. Boldface indicates significant results at alpha = .05.

rates of psychiatric hospitalizations and prior charges, and those with at least one charge showed lower criminal diversity compared with younger postillness starters.

First presenters had three times the odds of being in a relationship and six times the odds of earning their income compared with younger postillness starters. They also had half the odds of being homeless at the time of the index offense. They differed in terms of diagnosis: the relative odds of having a primary diagnosis other than mood spectrum or psychotic spectrum disorders rather than psychotic spectrum disorder were 2.7 times higher in first presenters than in younger postillness starters, and they had half the odds of having a comorbid substance use disorder.

Index Offense Characteristics

As hypothesized, there were few differences between the groups in terms of psychiatric symptoms at the time of the index offense (Table 4). Adolescent preillness starters were similar to younger postillness starters with respect to all characteristics of the index offense (Table 5). Adult preillness starters had lower odds of having a mention of psychotic symptoms at the time of the index offense compared with younger postillness starters. They also had lower odds of weapon use, and 50% increased odds of victimizing an acquaintance.

Older postillness starters had lower odds of drug/alcohol use at the time of the index offense compared with younger postillness starters. They also had lower relative odds of having perpetrated an index offense against a person and of having perpetrated an administrative offense (e.g., breaching conditions of release, failure to appear in court) rather than an "other" type of offense.

First presenters were those that showed the strongest differences from younger postillness starters in terms of index offense characteristics. They had lower odds of drug/alcohol use at the time of the offense, but twice the odds of suicidal ideation. They also had 1.5 times the odds of weapon use and

had almost twice the odds of victimizing a family member and of victimizing an acquaintance.

Outcomes Under the Review Board and Community Reintegration

We hypothesized that the postillness starters would have a shorter trajectory through the Review Board system than preillness starters. Similarly, when compared with the preillness starters, the postillness starters were expected to experience more successful community reintegration in terms of recidivism. Findings were generally consistent with these expectations. In fact, differences were observed regarding outcomes while under the purview of the Review Board and in the reoffense rates after the NCRMD verdict (Tables 6 and 7).

Adolescent preillness starters were similar to younger postillness starters, with the exception that they were more likely to recidivate. Adult preillness starters had lower relative odds of receiving a detention order in hospital as their first Review Board disposition and higher relative odds of receiving an absolute discharge as their first Review Board disposition rather than a conditional discharge compared with younger postillness starters. They also had higher rates of absolute discharge and release from detention before the end of the follow-up.

Older postillness starters and first presenters showed similar patterns in terms of outcomes compared with younger postillness starters. They both had higher relative odds of receiving an absolute discharge as their first Review Board disposition rather than a conditional discharge compared with younger postillness starters. They were both less likely to display violent behaviors, suicidal behaviors, and to use substances between Review Board hearings. Their rates of absolute discharge and release from detention were also higher than for younger postillness starters. They were also less likely to recidivate.

Table 4
Index Offense Characteristics by Group

Variable	Adolescent preillness starters (n = 173)	Adult preillness starters (n = 406)	Younger postillness starters (n = 621)	Older postillness starters (n = 323)	First presenters (n = 278)	Total (n = 1,800)
Most serious index offense						
Against the person	66%	65%	74%	70%	79%	71%
Property	18%	23%	15%	16%	13%	17%
Administrative	9%	6%	5%	2%	1%	5%
Other	7%	7%	6%	12%	7%	7%
Symptoms at index offense						
Any psychotic	58%	52%	62%	58%	54%	58%
Drug/alcohol use	30%	24%	26%	17%	18%	23%
Homicidal ideation	6%	5%	7%	5%	7%	6%
Suicidal ideation	5%	4%	5%	8%	11%	6%
Weapon use at index offense	20%	16%	22%	22%	28%	22%
Victim of the index offense ^a						
Family member	26%	19%	24%	25%	37%	26%
Stranger	23%	22%	19%	17%	15%	19%
Institutional	8%	7%	10%	10%	5%	9%
Police	12%	16%	17%	13%	16%	15%
Acquaintance	6%	13%	9%	8%	15%	10%

^a This only pertains to offenses against the person.

Table 5
Comparison of Index Offense Characteristics, Using Younger Postillness Starters as Reference Category

Variable	Adolescent preillness starters (n = 173)	Adult preillness starters (n = 406)	Older postillness starters (n = 323)	First presenters (n = 278)
Most serious index offense (relative OR, reference: Other)				
Against the person	.94 (.48, 1.85)	.81 (.50, 1.32)	.60 (.37, .97)	1.01 (.59, 1.74)
Property	1.35 (.63, 2.92)	1.43 (.83, 2.47)	.69 (.39, 1.22)	.79 (.41, 1.51)
Administrative	1.77 (.72, 4.34)	.96 (.47, 1.93)	.29 (.12, .73)	.24 (.07, .77)
Symptoms at index offense				
Any psychotic (OR)	.72 (.49, 1.04)	.75 (.57, .98)	.82 (.60, 1.10)	.78 (.57, 1.06)
Drug/alcohol use (OR)	1.21 (.83, 1.76)	.92 (.69, 1.23)	.59 (.42, .83)	.66 (.46, .93)
Homicidal ideation (OR)	.77 (.36, 1.52)	.70 (.39, 1.23)	.76 (.40, 1.38)	1.25 (.69, 2.20)
Suicidal ideation (OR)	.92 (.39, 1.93)	.84 (.45, 1.51)	1.34 (.77, 2.30)	2.11 (1.25, 3.56)
Weapon use at index offense (OR)	.84 (.54, 1.27)	.71 (.51, .98)	.99 (.71, 1.38)	1.47 (1.06, 2.05)
Victim of the index offense				
Family member (OR)	1.07 (.72, 1.57)	.76 (.56, 1.03)	1.03 (.75, 1.40)	1.86 (1.36, 2.53)
Stranger (OR)	1.26 (.83, 1.89)	1.30 (.95, 1.77)	.98 (.69, 1.40)	.79 (.53, 1.16)
Institutional (OR)	.78 (.41, 1.39)	.66 (.41, 1.03)	.96 (.60, 1.49)	.42 (.22, .74)
Police (OR)	.64 (.37, 1.04)	.86 (.61, 1.20)	.70 (.47, 1.03)	.87 (.58, 1.27)
Acquaintance (OR)	.66 (.31, 1.27)	1.51 (1.01, 2.25)	.86 (.52, 1.39)	1.73 (1.12, 2.66)

Note. OR = odds ratio. We performed a multinomial logistic regression for most serious index offense and binomial logistic regression for remaining variables, controlling for gender and province. We present ratios with 95% confidence intervals. Boldface indicates significant results at alpha = .05.

Discussion

Appraisal of Findings

To our knowledge, this is the largest study examining the operationalization of the early and late starter model of criminality proposed by Hodgins (2008) in a forensic psychiatric sample. The study is also unique by virtue of extending the model to five groups, including people whose index offenses leading to an NCRMD verdict was their first formal contact with both the justice and mental health systems (first presenters). We further broadened the application of this model to

consider both the full range of diagnoses among forensic patients, and a broader range of circumstances and symptoms at the time of the index offense.

Our results replicated findings from prior studies, which point toward traditional criminogenic needs (e.g., substance abuse, personality disorder, extensive criminal history) among forensic patients with preillness onset of crime (Hodgins et al., 2008; Kooyman et al., 2012; Laajasalo & Hakkanen, 2005; Mathieu & Côté, 2009; Sanchez-SanSegundo et al., 2014; Simpson et al., 2015; Sirotych, 2009; Tengström et al., 2001; Van Dongen, Buck, Barendregt, et al., 2015; Van Dongen et al., 2014; Van Dongen, Buck, & Van Marle, 2015). Our findings also reinforce prior research

Table 6
Outcomes Under the Review Board and Community Reintegration by Group

Variable	Adolescent preillness starters (n = 173)	Adult preillness starters (n = 406)	Younger postillness starters (n = 621)	Older postillness starters (n = 323)	First presenters (n = 278)	Total (n = 1,801)
First Review Board disposition						
Detain	7%	5%	9%	4%	3%	6%
Detain with conditions ^a	56%	42%	48%	37%	29%	42%
Conditional discharge	28%	34%	33%	41%	42%	36%
Absolute discharge ^b	9%	19%	9%	18%	25%	15%
Behavior between Review Board hearings						
Violence, any	43%	31%	40%	14%	18%	30%
Suicidal behavior, any	11%	8%	13%	5%	5%	9%
Noncompliance with conditions, any	64%	50%	62%	32%	36%	50%
Substance use, any	53%	37%	50%	17%	23%	38%
Noncompliance with medication, any	47%	46%	53%	32%	32%	44%
Rehospitalization, any	45%	36%	46%	30%	29%	38%
Absolutely discharged by the end of the study	57%	69%	64%	82%	79%	70%
Released from detention by the end of the study	75%	81%	76%	90%	89%	82%
Recidivism	36%	29%	26%	11%	15%	23%

^a Detention with conditions may be equivalent to conditional discharge as it allows the hospital to release the accused under supervision in certain circumstances. ^b When Individuals found Not Criminally Responsible on account of mental disorder (NCRMD) are granted an absolute discharge, they are no longer under the authority of the Review Board.

Table 7

Comparison of Outcomes Under the Review Board and Community Reintegration, Using Younger Postillness Starters as Reference Category

Variable	Adolescent preillness starters (<i>n</i> = 173)	Adult preillness starters (<i>n</i> = 406)	Older postillness starters (<i>n</i> = 323)	First presenters (<i>n</i> = 278)
First Review Board disposition (relative <i>OR</i> , reference: Conditional discharge)				
Detain	.82 (.40, 1.67)	.52 (.29, .90)	.39 (.20, .78)	.26 (.12, .57)
Detain with conditions	1.15 (.73, 1.82)	.87 (.62, 1.23)	.61 (.42, .87)	.46 (.31, .68)
Absolute discharge	1.11 (.57, 2.17)	1.93 (1.27, 2.94)	1.56 (1.00, 2.42)	2.07 (1.35, 3.19)
Behaviors between Review Board hearings (<i>RR</i>)				
Violence	1.08 (.83, 1.39)	.94 (.76, 1.17)	.52 (.37, .71)	.70 (.51, .95)
Suicidal behavior	.89 (.52, 1.44)	.81 (.53, 1.21)	.49 (.27, .84)	.57 (.30, .98)
Noncompliance with conditions	1.05 (.84, 1.29)	.93 (.78, 1.10)	.65 (.52, .80)	.81 (.64, 1.01)
Substance use	1.04 (.82, 1.31)	.85 (.70, 1.04)	.43 (.32, .57)	.64 (.48, .84)
Noncompliance with medication	.90 (.70, 1.14)	.99 (.83, 1.19)	.78 (.62, .97)	.82 (.65, 1.04)
Rehospitalization	.96 (.74, 1.23)	.96 (.78, 1.17)	.79 (.62, .99)	.89 (.69, 1.14)
Absolute discharge (<i>HR</i>)	.96 (.77, 1.20)	1.25 (1.08, 1.46)	1.65 (1.41, 1.94)	1.77 (1.50, 2.09)
Release from detention (<i>HR</i>)	1.09 (.90, 1.32)	1.37 (1.19, 1.58)	1.80 (1.55, 2.08)	1.80 (1.54, 2.11)
Recidivism (<i>HR</i>)	1.64 (1.21, 2.22)	1.09 (.85, 1.40)	.31 (.20, .47)	.47 (.33, .67)

Note. *OR* = odds ratio; *RR* = risk ratio; *HR* = hazard ratio. We performed negative binomial regressions for behaviors between Review Board hearings, a multinomial logistic regression for first disposition, and Cox regressions for absolute discharge, release from detention, and recidivism. We controlled for gender and province in all models and for time in detention for behaviors between Review Board hearings. We present ratios with 95% confidence intervals. Boldface indicates significant results at $\alpha = .05$.

revealing the heterogeneity among adult criminal-onset individuals (Simpson et al., 2015; Van Dongen, Buck, & Van Marle, 2015) that could not have been observed in studies using the original two-group model. These findings help to disentangle unique and important needs among subgroups of forensic psychiatric patients that could be targeted in prevention, rehabilitation and risk management strategies.

As expected from previous studies, comorbid substance use disorder was less common among adult postillness starters and first presenters and more common among adolescent preillness starters (Hodgins et al., 2008; Kooyman et al., 2012; Laajasalo & Hakkanen, 2005; Mathieu & Côté, 2009; Pedersen et al., 2010; Simpson et al., 2015; Sirotych, 2009; Tengström et al., 2001; Van Dongen, Buck, & Van Marle, 2015). Older postillness starters and first presenters were also less likely to have used alcohol or drugs at the time of the offense. The role of mental health symptoms vis-à-vis substance use in relation to the index offense requires further consideration for a verdict of NCRMD. While substance use may be an indicator of antisociality and moderate the relationship between mental illness and crime, it can also be a consequence of mental illness because of self-medication or increased vulnerability to substance use (Bizzarri et al., 2009). Thus, consistent with prior research (Hodgins et al., 2008; Laajasalo & Hakkanen, 2005; Mathieu & Côté, 2009; Pedersen et al., 2010; Sanchez-SanSegundo et al., 2014; Simpson et al., 2015; Sirotych, 2009; Tengström et al., 2001; Van Dongen et al., 2014), the added presence of substance use disorders and personality disorders appears to be important in differentiating mentally ill individuals who are at elevated risk of criminal versatility and recidivism (i.e., early starters/preillness offenders; Ogloff, Talevski, Lemphers, Wood, & Simmons, 2015).

Younger postillness starters had similar risk of problem behaviors while under the Review Board to preillness starters, and were less likely than all the other groups (except for adolescent

preillness starters) to be discharged by the end of the study. However, their risk of recidivism is not particularly high which bears the question regarding the justification of time spent under the Review Board purview. They seem to be getting into trouble for noncompliance and substance use issues but do not seem to pose a particularly great risk of violence. As hypothesized, the older postillness starters and the first presenters had very low risk of problem behaviors while under the Review Board, and a low risk of recidivism.

This study sheds light upon a little-known group of offenders, who had no prior contact in either the justice and mental health systems. Although Hodgins (2008) and Van Dongen et al. (2014) had discussed and examined “first offenders,” a group of mentally ill offenders who unexpectedly commit a very serious crime without any prior signs of antisociality, they seemed to have already had contact with mental health services, which is not the case of the first presenters. First offenders and first presenters are similar in that they both have better psychosocial functioning than the other groups. This group is of particular clinical interest and requires more investigation. This group is more likely to be found NCRMD following a tragic event involving a family crisis or in a highly emotionally distressed situation, including suicidality. To date, relatively little attention has been paid in terms of identifying flags and signs for potential prevention strategies with this group of individuals who are also most likely to recover and reintegrate into society safely.

Implications for Risk Management and Service Organization

These results suggest that the early and late starter model is relevant to risk management, as it is associated with violence and criminal recidivism. The new five-group model provides more refinement in potential developmental and services trajectories of

this heterogeneous population. Examining potential typologies can be helpful in attempting to understand pathways to offending among individuals entering forensic services and targeting intervention strategies. For example, a clear focus on antisocial attitudes and behavior would be optimal for the adolescent preillness starters whereas more focus may be put on illness management for the older postillness starters and the first presenters. The model is associated with dynamic risk factors such as failure to comply with conditions, substance use, and medication noncompliance, which are all potential targets for ongoing intervention.

It is an accepted principle of the risk-need-responsivity model that low-risk individuals should receive minimal or less intense services because providing more intense services is unnecessarily costly and raises the potential of iatrogenic effects (Andrews, 2012). Given the costs of forensic hospitalization from an economic perspective and in terms of potential loss of employment, income, housing, and relationships, which are all protective against further crime, particular attention to duration of forensic hospitalization for the the older postillness starters and first presenters would appear warranted. Consideration should be given to the potential iatrogenic effect of undue (lengthy) hospitalization or Review Board purview if the patient responded well to medications and psychiatric symptoms have abated; particularly, if the patient does not have prior criminal justice involvement and/or other antisocial behavior. While they were more likely to be absolutely discharged by the end of the study, it is possible that forensic services are “over managing” these two groups by keeping them under the Review Board mandate longer than necessary.

Although individualized risk assessments are essential to address specific needs and responsivity issues, knowledge of case-mix can potentially guide resource allocation and flag whether alternative, less expensive responses (e.g., diversion from the justice system to mental health services, even greater use of absolute or conditional discharge) might be warranted. Appropriate discharge from forensic services may be important to ensure optimal health and prevent escalation of criminal risk, reduce to the greatest extent possible the stigma associated with the forensic label and from a system-level can help to reduce the considerable back-log of beds common in forensic contexts. The model could provide a clinical-administrative tool in service planning at the organizational level.

Strengths and Limitations

We have compiled one of the largest samples of persons found not criminally responsible, worldwide, allowing us to examine important subgroups, rare diagnostic categories, and low base rate events. Our longitudinal design is another strength.

The interpretation and generalizability of the results of this study must also consider the following limitations. Although the study finds its strengths in the consideration of risk factors across the life course (e.g., historical factors in adolescence, circumstances immediately prior to offending and follow-up after the NCRMD verdict), as well as our large sample size, it is limited by virtue of being a retrospective file-based study. Thus, the quality of the information is limited to what was available in official records and Review Board files. For example, diagnoses and the presence of symptoms at the time of the index offense were based on expert clinicians' reports to the courts. Furthermore, we did not have

access to lifetime hospitalization records and could not verify the exact dates of first mental health services contact or hospitalization of what was mentioned in expert reports. Moreover, using the age of first mental health services contact as a proxy for mental illness onset has limitations, as some individuals could have symptoms of mental illness without being treated. Differences in arrest practices and rates may also influence generalizability of results across jurisdictions. Furthermore, criminal behavior onset and recidivism rates are limited to some extent because of our reliance on official records in the absence of self-report.

Finally, while the early and late starter model is conceptually straightforward, it has been inconsistently operationalized over time. For example, some studies follow the initial model by Hodgins and her colleagues and distinguish early and late starters based on diagnoses of conduct disorder or criminality during youth (Hodgins et al., 2008; Mathieu & Côté, 2009; Pedersen et al., 2010; Sanchez-SanSegundo et al., 2014; Tengström et al., 2001), whereas others have operationalized the model based on the sequence of onset of severe mental illness and of criminal behavior (Jones et al., 2010; Kooyman et al., 2012; Laajasalo & Hakkanen, 2005; Simpson et al., 2015; Sirotych, 2009; Van Dongen, Buck, Barendregt, et al., 2015; Van Dongen et al., 2014; Van Dongen, Buck, & Van Marle, 2015). Other studies used either onset of symptoms (from self-report or medical files) or first psychiatric admission as proxies for mental illness onset (Jones et al., 2010; Simpson et al., 2015; Van Dongen et al., 2014). Because of the delay between onset of symptoms and mental health service use, this decision of how to determine the timing of onset of mental health and criminal behavior is unclear. On the one hand, the consistency of findings despite methodological differences speaks to the robustness of the general model. On the other, it highlights the potential challenges for using the model in clinical practice until more systematic replication studies are conducted.

Conclusion

The early and late starter model (Hodgins, 2008) is an intuitive and accessible way to examine the developmental pathways to offending and future trajectories of forensic patients; it offers essential insights into meaningful subgroups of this otherwise large and heterogeneous population. It is an important model for understanding the role of mental illness in criminality and can provide a starting point for estimating risks and planning for needs. This type of developmental model can plant the seeds for more intensive criminogenic risk assessment and intervention strategies (Skeem et al., 2014). The model also can provide a framework for medium and longer term resource allocation within forensic and civil mental health services, as well as correctional settings, as the distribution of populations entering these systems evolve over time (Simpson et al., 2014). Given little information is needed to identify the groups, computing the distribution of these groups within forensic mental health services or across services can provide estimates of potential intensity or duration of services which might be needed. Furthermore, using the typology as an initial services screening indicator to determine where to focus the assessment and management of risk at the patient level may provide useful for the initial orientation of patients to types of services or teams. More research on the administrative use of this typology in

modeling the organization of services could provide a new tool for macrolevel service planning in various jurisdictions.

The development and validation of a revised and expanded version of Hodgins' model (Hodgins, 2008) of this sort may also provide opportunities for investigating causal mechanisms of violence and criminality among persons with mental illness in order to shape management and treatment. Our research also suggests that more research is needed to better understand the pathways into the criminal justice system, particularly among older postillness starters. Prospective studies with clinical interviews and longitudinal follow-ups that focus on the potential intervention strategies and outcomes of interventions across the different groups of early and late starters so that its well-established value for risk prediction (Sanchez-SanSegundo et al., 2014; Simpson et al., 2015) can be extended to the ultimate goals of risk management and rehabilitation are needed.

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