Running Head: AGE AND RISK ASSESSMENT

Adjusting Actuarial Violence Risk Assessments Based on Aging or the Passage of Time

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Abstract

We report two studies that address age, the passage of time since the first offense, time spent incarcerated, or time spent offense free in the community as empirically justified post-evaluation adjustments in forensic violence risk assessment. Using three non-overlapping samples of violent offenders, the first study examined whether any of three variables (time elapsed since the first offense, time spent incarcerated, and age at release) were related to violent recidivism or made an incremental contribution to the prediction of violent recidivism after age at first offense was considered. Time since first offense and time spent incarcerated were uninformative. Age at release predicted violent recidivism but not as well as age at first offense, and it afforded no independent incremental validity. Using age at first offense in place of age at release in actuarial instruments for sex offenders improved the prediction of violent and sexual recidivism. In the second study, using the same three samples combined, time spent offense-free while at risk was related to violent recidivism such that an actuarial adjustment for the *Violence Risk Appraisal Guide* could be derived. The results supported the use of adjustments (based on the passage of time) to actuarial scores, but only adjustments that are themselves actuarial.

Adjusting Actuarial Violence Risk Assessments Based on Aging or the Passage of Time

Much research demonstrates that crime, violent crime, and sexually violent crime are inversely related to age and that age is a robust predictor of each of these outcomes (e.g., Bonta, Law, & Hanson, 1998; Gendreau, Little, & Coggin, 1996; Hanson & Bussière, 1998; Hirschi & Gottfredson, 1983). Most of the evidence about age and recidivism comes from cross-sectional studies examining the recidivism of offenders released at different ages. There is considerably less research about whether individual offenders become less likely to commit violent crimes or sexually violent crimes as they get older. That is, we know age is a predictor of crime, but we know less about whether aging is a predictor. It is possible that, as offenders age, they become more risk-averse (perhaps due to declining testosterone levels) and thus less likely to seek circumstances favoring the commission of criminal acts. On the other hand, perhaps the highest risk offenders, compared with those of lower risk, receive progressively longer sentences throughout their criminal careers, and thus fewer are released in any given year as they age. If so, age would be inversely related to criminal recidivism due to an artifactual association between individual differences in criminal predisposition and opportunity.

A comprehensive study of aging and criminality by Laub and Sampson (2003) examined life-course criminality in the 500 original subjects of a study by Glueck and Glueck (1950; 1968) of adolescent boys remanded to reform schools in Massachusetts. Whereas the earlier studies examined criminality in young adulthood, Laub and Sampson conducted a new follow-up by searching records of death and offending for all 475 men still alive at age 32, following them to age 70. Crime and violent crime decreased with age. Violent crime peaked at a later age than property crime and decreased more slowly, but was at about half its peak by age 40, and near zero by 65. This and the few other longitudinal studies on the topic indicate that many, and

perhaps most, adolescent males who commit an offense exhibit declines in violent crime as they age. These studies do not, however, demonstrate that all young males do, especially the small minority of serious chronic violent offenders that might be candidates for preventative detention.

The relationship between age and recidivism arises prominently in the assessment of the risk posed by the most serious violent offenders, including men convicted of sexually violent crimes. Recently, a few studies of sex offenders have concluded that the risk of recidivism decreases with age (Barbaree, Blanchard, & Langton, 2003; Hanson, 2002, 2005). Some investigators have concluded that those who assess risk for offenders being evaluated as sexually violent persons (SVPs), for example, should adjust actuarially assessed risk downward for older offenders (Barbaree et al., 2003). Similarly, after finding that older offenders obtained lower scores on an actuarial instrument for the prediction of sex offense recidivism than younger offenders and that older offenders also had lower recidivism rates than expected from their actuarial scores, Hanson (2005) advised advanced age be considered separately (from actuarial score) as another factor in the overall estimate of risk.

If the dynamic effects of aging actually caused the risk of violence to decrease in all offenders, including the most serious ones, then the forensic assessment of risk would require that current age always be explicitly addressed. That is, two violent offenders with identical scores on an actuarial risk assessment (that excluded current age) with very different ages might be expected to receive different dispositions because the older offender would actually represent lower violence risk, identical actuarial scores notwithstanding. Conversely, if the robust relationship between age and recidivism in typical cross-sectional research were entirely due to a relationship among static variables associated with life course criminal proclivity and opportunity, optimal violence risk assessment would not require current age to be incorporated.

This expectation would hold under circumstances in which the risk factors already incorporated in the actuarial instrument adequately indexed such enduring, long-term antisocial proclivity.

Examining current forensic practice leaves the issue unresolved. Generally, the field of violence risk assessment has progressed beyond unstructured clinical judgment and one now expects risk assessment to be based on one of two predominant approaches – actuarial or structured professional discretion. Actuarial approaches to violence risk assessment are explicitly based on one or more follow-up studies and the selection and weighting of risk factors are directly based on the items' empirical relationship with a measured outcome (violent, criminal, or sexual recidivism). Interesting in this context is that two of the four most widely known exemplars of this approach incorporate items pertaining to current age. That is, the Static-99 (Hanson & Thornton, 2000) and the Rapid Risk Assessment for the Assessment of Sex Offense Recidivism (RRASOR, Hanson, 1997) include current age as a dichotomous item in assessing the risk that sex offenders will incur a subsequent criminal charge for a sex offense. The *Violence Risk Appraisal Guide* and *Sex Offender Risk Appraisal Guide* (VRAG and SORAG, respectively, Harris, Rice, & Quinsey, 1993; Quinsey, Harris, Rice, & Cormier, 2006) do not incorporate current age, but do include an item pertaining to the age at the index offense.

The three most widely known structured clinical discretion systems are lists of 20 factors empirically associated (or assumed to be) with violence, together with instructions that they be considered in rendering a final trichotomous (low, moderate, high) evaluation (Boer, Hart, Kropp, & Webster, 1997; Kropp, Hart, Webster, & Eaves, 1995; Webster, Douglas, Eaves, & Hart, 1997). Criteria for the ultimate evaluation are unstated, but interestingly, none of these widely known systems (the HCR-20, the Spousal Assault Risk Assessment Guide, and the Sexual Violence Risk – 20) incorporate current age[1] as an item or even suggest it be considered.

Understanding the provenance of both types of formal risk assessments explains why they can be limited to a fairly short (4 to 20) list of items and why maximally accurate assessment need not include every known empirical predictor of violent recidivism. Items need be included only when they afford incremental validity in the prediction of the outcome. Because existing risk assessments do not seem to consider age at release adequately, or consider an earlier age, or omit age entirely, the straightforward practical questions addressed here are: "Does forensic assessment require an assessee's estimated violence risk be adjusted based on his current age (or the amount he has aged)? And if so, how should such an adjustment be done?"

One might think the first answer must be affirmative because of the relationship between age and recidivism. However, the known relationship between age and recidivism cannot be automatically applied to the question of adjusting the results of formal risk evaluations because almost all studies to date have been cross-sectional. As mentioned above, in cross-sectional studies, it is possible that offenders released at older ages are different in other, risk-related ways from those released at younger ages, and these cohort-related characteristics better account for and index differences in violence risk. Of course, the best way to address these questions would be to follow a group of seriously violent offenders over their lifetimes, examining rates of violent or sexually violent offending as they aged. Rates would correct for lost opportunity due to institutionalization or death. The practical difficulties involved mean, however, that few such studies have been conducted. One longitudinal study by Hare and colleagues (Hare, Forth, & Strachan, 1992) reported, however, that the highest risk offenders (those with high scores on the Hare Psychopathy Checklist) exhibited no significant age-related declines in violent crime. Such studies are rare and the effects of aging on violent behavior in the most serious offenders must usually be approached indirectly. The purpose of the present study was to use indirect analyses to

shed light on whether formal risk assessments must always be explicitly "corrected" for the time that passes while offenders are incarcerated before release.

In follow-up studies of violent offenders conducted by our research group, we have routinely recorded offenders' age at the time of their first known offense (or whether they had been arrested prior to age 16). We also record age at the time of the index offense – age when the subject entered the cohort. We have also routinely recorded the age subjects were when they first received the opportunity to recidivate (release to the community, admission to an open hospital ward, transfer to a half-way house) which we here call age at release. This would correspond to current age in the case of release decisions. For the present study, we reasoned that if violent recidivism or sexual recidivism specifically (that is, reoffenses known to be sexual from police rapsheets) were better predicted by age at release, or if the passage of time while incarcerated added to predictive accuracy, then there is evidence that aging causes decreased recidivism, and, more importantly, that risk assessment must explicitly address current age. Conversely, if recidivism was predicted just as well or better using age at first offense, then the idea that aging causes declines in recidivism is severely undermined. Furthermore, if the amount that an offender has aged since his first offense added nothing to age at first offense in the prediction of recidivism, then it cannot be argued that current age must be incorporated into risk assessment or that recidivism is affected by the dynamic effects of aging. That is, age at release must be a much better index of the dynamic effects of aging than age at first offense. If age at first offense better predicts violent recidivism, and if the passage of time since the first offense affords little or no incremental validity, it must be argued that those offenders released at older ages are different in risk-related ways, independent of age, from those released younger.

Method

Overview

The primary data came from three non-overlapping samples (see Table 1) previously reported elsewhere (Harris et al., 2003; Harris, Rice, Cormier, 2002; Rice & Harris, 1995) for a total sample of over 1300 offenders. In each case, we examined the intercorrelations among violent recidivism and three ages: age at release (the subject's age when he first had the opportunity to commit violent recidivism), age at index offense (the subject's age when he committed the offense that resulted in his entry into the study sample), and age at first offense (the subject's age for the first criminal charge on his criminal record). In one sample, whether the offender had been arrested under the age of 16 was used instead of age at first offense because we had not included age at first offense as a variable. We also examined the predictive value of the amount of time that had passed while the offender was incarcerated (age at release minus age at index offense), and the amount of time that had passed since the offender's first offense (age at release minus age at first offense, or minus age 16 if the offender had been arrested under age 16 in the sample in which that was the relevant variable). Additional analyses involved scores on the Psychopathy Checklist-Revised (PCL-R; Hare, 2003) and the actuarial Violence Risk Appraisal Guide (VRAG; Harris et al. 1993; Quinsey et al., 2006). As described in the original studies, the coding of these age variables (and the PCL-R and VRAG) was always done by independent teams of research assistants based entirely on clinical record documentation compiled before offenders' release and independently from (and blind to) the coding of recidivism. Previous reports indicated that these age variables and recidivism were coded with high inter-rater reliability. Overall, approximately 10% of the present subjects were over age 50 at release, and 3% over age 60. For each analysis, subjects without complete data (maximum 2%) were dropped.

The Violence Risk Appraisal Guide (VRAG) is an actuarial violence risk assessment developed on 618 violent offenders evaluated in a maximum security forensic psychiatric facility. Most in this development sample were convicted before or after the evaluation while a minority was found not guilty by reason of insanity; about a quarter met the diagnostic criteria for a psychotic disorder. In development, the VRAG's items were selected for their ability to provide independent and incremental information about the likelihood that subjects later met the operational definition of violent recidivism – a criminal charge for a violent offense or reinstitutionalization for violent conduct that would otherwise have resulted in a criminal charge. The VRAG's 12 items are: Hare Psychopathy Checklist (PCL-R; Hare, 2003) score; elementary school maladjustment, having been separated from parents before age 16, nonviolent criminal offense history, never having married, alcohol abuse history, failure of prior conditional release, young age at index offense, not having female victim in the index offense, injury caused in the index offense (inverse scored), meeting diagnostic criteria for personality disorder, and not meeting diagnostic criteria for schizophrenia. Norms for the VRAG (Quinsey et al., 2006) provide a percentile rank for each possible VRAG score, and the observed rates of violent recidivism for subjects in each of nine equal-sized score ranges (VRAG categories) for two mean durations of opportunity. Total scores on the VRAG have also been reported to predict severity and latency of violent recidivism (Harris et al., 2002, 2003; Quinsey et al., 2006). The predictive ability of the VRAG has been replicated approximately in 40 other studies (Quinsey et al., 2006; www.mhcp-research.co/ragreps.htm) with, on average, a large effect size. VRAG scores have been associated with the probability of subsequent violent misconduct among institutional inmates and violent recidivism among released forensic psychiatric patients, general criminal offenders, violent felons, sex offenders, wife assaulters, and civil psychiatric patients (Quinsey et

al., 2006). Predictive effects are larger than average to the extent that the VRAG is scored with high reliability and without dropping or substituting items (Harris & Rice, 2003).

Sample 1

This sample (n = 143) were those subjects with data on the duration of the follow-up from an earlier study of all forensic patients (except for those on warrants of remand for psychiatric examination) in the province of Ontario in 1990 (Rice, Harris & Quinsey, 1996). All who had an opportunity to commit further violent offenses were followed up for an average of approximately seven years (Harris et al., 2002). The large majority (83%) had been found not guilty by reason of insanity or unfit to stand trial for seriously violent criminal offenses and such persons are subject to indefinite dispositions. There were also civilly committed patients who had been unmanageable on ordinary psychiatric wards (8%); and other patients (9%). After treatment in secure settings, most patients were transferred to nonforensic locked wards, then to ordinary open psychiatric wards, and later to the community.

Sample 2

This sample (N = 396) came from an earlier study of risk assessment among sex offenders (Harris et al., 2003). All men had been charged with a criminal offense involving either sexual contact with a child under 15 years old while the offender was at least five years older than the victim (child molesters), or forceful or coercive sexual contact with an adult woman (rapists) or both. There were four groups; the first comprised all 118 sex offenders admitted to Oak Ridge and assessed in our sexual behavior laboratory between 1974 and 1994, who had not been included in earlier follow-up studies, and who had had an opportunity to reoffend before April 1, 1996. The second group comprised all 87 men assessed from 1979 to 1994 who were referred from community sources (primarily provincial probation officials or federal parole

officers) and who were at risk to reoffend at the time of the assessment. The third group was comprised of 96 federal inmates released from the Regional Treatment Centre, Kingston Penitentiary between 1977 and 1989, a randomly selected subsample of the subjects reported elsewhere (Quinsey, Khanna, & Malcolm, 1998). The fourth group were 95 inmates from the Regional Psychiatric Centre, British Columbia released between 1978 and 1984. The subjects were followed up after an average duration of five years (Harris et al., 2003).

Sample 3

This sample consisted of the 799 men who had been in an earlier study that examined the performance of the VRAG in predicting violent recidivism (Rice & Harris, 1995) under different base rate conditions. The male subjects had all been admitted to a maximum security psychiatric facility before 1984 in order to participate in an intensive therapeutic community treatment program (Rice, Harris, & Cormier, 1992), because they had been found not guilty by reason of insanity (Rice, Harris, Lang, & Bell, 1990), pursuant to a court-ordered remand for psychiatric assessment (Rice & Harris, 1990), or to receive specialized sex offender assessment or treatment (Quinsey, Rice, & Harris, 1995; Rice, Harris, & Quinsey, 1990; Rice, Quinsey, & Harris, 1991). The characteristics of the sample were described in detail in the earlier reports. Briefly, virtually all (>99%) had already committed a violent offense ranging from armed robbery to homicide. The previous publications indicated that this was a high-risk sample because of lengthy criminal backgrounds, disturbed childhoods, alcohol abuse histories, and violent index offenses. The sample was followed-up after a mean of ten years of opportunity (Rice & Harris, 1995).

Recidivism

The primary sources of the independently coded outcome data were records of charges and convictions of the Fingerprint Service of the Royal Canadian Mounted Police (a national

register), plus institutional records of subsequent violent behavior. Dichotomous violent recidivism was defined as any new criminal charge for an offense against persons (e.g., homicide, attempted homicide, assault causing bodily harm, armed robbery, kidnapping, assault, and sex offenses involving physical contact) after being released from the study institution. Also included were violent or sex offenses (in the records of subsequent institutions or in files of the parole service) even if formal charges were not laid. For Sample 2, we coded whether a violent offense could be ascertained from the police record to have been sexually motivated (e.g., sexual assault or rape). We called this "rapsheet sexual recidivism" because it was what has generally been called "sexual recidivism" even though, as we have shown elsewhere (Rice, Harris, Lang, & Cormier, in press), it is a biased underestimate of sexually motivated violent recidivism.

Results and Discussion

Table 1 shows summary statistics for the study variables, and Tables 2 and 3 show the variable inter-correlations for the three samples separately. Clearly, age at first offense (or having been arrested under age 16) was consistently the best predictor of violent recidivism; age at index offense and age at release were also consistently related to recidivism, but the passage of time while incarcerated and time since the first offense were relatively uninformative about the risk of violent recidivism. As well, the three age variables exhibited considerable colinearity. The next empirical question pertained to the independent contribution of these temporal variables in the assessment of violence risk. For each sample, we conducted three simultaneous binary logistic regression analyses in which dichotomous violent recidivism was the dependent variable and the best age-related variable (always age at first offense or arrested under age 16), together with the two variables pertaining to the passage of time were tested as covariates. For Sample 1, only the variable pertaining to whether the subject had been arrested under age 16 made an

independent contribution to the prediction of violent recidivism, Wald statistics (df = 1) = 3.69, $p < .06$, Nagelkerke R-square = .071. For Sample 2, age at first offense was the only independent statistically significant predictor of violent recidivism, Wald statistic (df = 1) = 13.94, $p < .001$, Nagelkerke R-square = .121. For Sample 3, age at first offense was also the only statistically significant independent predictor of violent recidivism, Wald statistic (df = 1) = 47.38, $p < .001$, Nagelkerke R-square = .147. Tackling the same question using forward conditional (stepwise) binary logistic regression yielded similar results. In Samples 1 and 2, age at first offense/having been arrested under age 16 was the only independent variable selected, Wald statistics (df = 1) = 7.21, $p < .01$, Nagelkerke R-square = .070; and 11.49, $p < .001$, Nagelkerke R-square = .095. In Sample 3, age at first offense was selected first (Wald statistic (df = 1) = 49.81, $p < .001$, Nagelkerke R-square = .133) and the amount of time since the first offense was second, but its incremental contribution was very small, Wald statistic (df = 1) = 5.99, $p < .05$, increase in Nagelkerke R-square = .013. These results imply that almost all of the statistical effects of age on violent recidivism was attributable to age at first offense, with very little attributable to the passage of time since that first offense (and therefore to age at release). Passage of time while incarcerated was uninformative regarding the risk of violent recidivism.

Under the hypothesis that the statistical effects of age at release are largely due to the associations among static variables reflecting enduring antisocial proclivity, we evaluated the independent contributions of age to the prediction of violent recidivism in addition to VRAG score. As expected (and reported in the original studies), VRAG score always yielded a significant effect, Wald statistics (df = 1) = 15.90, 25.08, and 96.66, for Samples 1, 2 and 3, respectively; Nagelkerke R-square = .167, .171, and .251, all p's < .001. In no instance did the amount of time since the first offense, the time spent incarcerated, age at release, or age at first

offense make an incremental independent statistically significant contribution to the prediction of violent recidivism[2] assessed with simultaneous logistic regression analyses. The VRAG incorporates age at index offense as an item, but neither age at release nor the amount the offender had aged during incarceration or since his first offense made an additional contribution to the prediction of violent recidivism. Without doubt, age at release and the amount an offender has aged must be better indexes of the dynamic effects of aging than age at index offense.

Based on similar reasoning, we examined two actuarial assessments designed for sex offenders that do incorporate age at release (RRASOR and Static-99) in Sample 2. Here we reasoned that, if replacing age at release with age at first offense yielded greater predictive accuracy, then the predictive effect of age on recidivism could not have been primarily due to the dynamic effects of aging. If such a replacement actually led to better predictive accuracy, it would be apparent that optimal forensic violence risk assessment could be achieved without incorporating current age. The scoring criteria were left unaltered and merely applied to the different age variable. Thus, for violent recidivism, the original RRASOR yielded a correlation of .111, $p < .001$, but increased when modified to .137, $p < .001$. Similarly, the original Static-99 yielded a correlation of .213, $p < .001$ with violent recidivism which upon modification increased to .241, $p < .001$. For rapsheet sexual recidivism, the original RRASOR yielded a correlation of .143, $p < .001$ which increased to .151, $p < .001$ upon modification, while the original Static-99's correlation with rapsheet sexual recidivism remained unchanged by the age modification, $r = .173$, $p < .001$. In almost every instance, prediction was improved (and never worsened) by using age at first offense instead of age at release, even though age at release must be a better index of the dynamic effects of aging than age at first offense.

The originators of the Static-99 have indicated that improving the scoring of age at release, by having four instead of two possible values for its age item, would also improve predictive accuracy (Hanson & Thornton, 2003). Incorporating this change into the scoring of the Static-99 in Sample 2 actually seemed to worsen the prediction of violent recidivism, r = .107, $p < .05$, and rapsheet sexual recidivism, r = .108, $p < .01$. On the other hand, incorporating the same change but instead using age at first offense (and the overall mean difference of 11 years between age at first offense and age at release) seemed to improve predictive accuracy for violent recidivism, r = .265, $p < .001$, and rapsheet sexual recidivism, r = .187, $p < .001$. All these results were confirmed by binary logistic regression analyses in which the original Static-99 or RRASOR score was entered first in the prediction of the outcome and then age at first offense was tested. In each case, age at first offense made a statistically significant independent and incremental improvement in the prediction of the outcome. Wald statistics (df = 1) for the addition of age at first offense ranged from 20.45 to 27.93, with R-square increases from .051 to .125, all $p < .01$ for violent recidivism; and 7.76 to 10.31, with R-square increases ranging from .036 to .052, all $p < .05$, for rapsheet sexual recidivism. These results strongly suggested that the contribution of age to the prediction of recidivism by the Static-99 and RRASOR was not, in fact, due to these assessments' incorporation of the dynamic effects of aging. Rather, it seemed clear that the Static-99 and RRASOR could achieve even better predictive accuracy using an age variable that cannot reflect the dynamic effects of aging – age at first criminal offense.

We conclude, therefore, that optimal forensic violence risk assessment can be achieved without addressing current age and without adjusting risk scores based on current age (or the duration of incarceration) as long as the assessment adequately addresses enduring antisocial proclivity. We suggest further that the present results imply that age at first offense better

predicts recidivism and subsumes the predictive effects of age at release (and time since first offense and duration of incarceration) because it is, in fact, more closely related to enduring antisocial proclivity than age at release or the passage of time during incarceration. This implies that a measure of enduring antisocial proclivity such as the Hare Psychopathy Checklist (PCL-R, Hare, 2003) should be most closely related to age at first offense. The correlations between the temporal variables and PCL-R score are shown in Table 4. In every case, the variable most highly correlated with PCL-R score was age at first offense (or arrested under age 16). The same results were obtained when juvenile delinquency was removed from the PCL-R. Interesting and consistent with the hypothesis about an artifactual association between risk and opportunity in the Introduction, subjects with high PCL-R scores spent more time incarcerated.

We suggest that these results imply the dynamic effects of aging are quite small (and perhaps negligible) in comparison to the static effects of enduring antisocial proclivity, at least for the offender populations and age ranges represented by the present samples. These hypotheses lead to the expectation that, on average, those offenders released at relatively advanced ages should be especially low risk. In the present data, those offenders released at older ages had less serious antisocial backgrounds even though they generally had more opportunity to accumulate records of antisocial conduct. For example, for all subjects combined, those over the median age at release (31.9 yr) had significantly lower scores on the PCL-R than those released under the median age, 14.2 (SD = 8.4) versus 17.1 (SD = 8.3), t (1178) = 5.88, $p < .001$. Similarly, those released over the median age had lower VRAG scores, -2.88 (SD = 11.3) versus 6.37 (SD = 10.36), t (1215) = 14.88, $p < .001$. Combining all three samples yielded a reasonably large sample of 113 offenders released over the age of 50 of whom only 15 (13%) exhibited violent recidivism; the oldest violent recidivist was 66 years old at the time he was released.

More central to our hypothesis, only four of the 113 scored 25 or more on the PCL-R (none scored 30 or more) which, nevertheless, predicted violent recidivism, r (df = 113) = .26, $p < .01$. As implied by these results, the highest risk offenders in these three samples (i.e., those in the highest quartile on the VRAG) were considerably younger at release than the groups as whole, 28.5 (SD = 7.46) versus, 34.9 (5.53), t (1301) = 2.08, $p < .01$, and exhibited a significantly higher rate of violent recidivism, 63% versus 46%, $p < .01$.

Study 2

We conclude that the passage of time (in the form of aging while incarcerated or the time since the first offense) is relatively uninformative in the assessment of risk for violent recidivism. The present data implied that the statistical effects of age (whether age at first offense or age at release) on violent recidivism are due mostly to the effects of an enduring predisposition towards violent crime in which age at release is a proxy for age at first offense, the best age-related indicator of enduring antisocial proclivity or psychopathy. Do these results and conclusions mean that the passage of time never has a statistical effect on the likelihood of violent recidivism? We hypothesized that the only circumstance under which the passage of time renders information (i.e., reduces uncertainty) about violent recidivism is when the passage of time occurs with opportunity to reoffend. That is, extended periods of offense-free conduct by released offenders do yield information about risk of violent recidivism, not because of the dynamic effects of aging (otherwise time spent incarcerated would have been informative about recidivism and being offense-free would not be), but because lengthy periods of offense-free behavior indicate measurement error in the assessment of enduring antisocial proclivity or that uncommon, but possible, changes in such proclivities have occurred. In support of this hypothesis, A. Harris, Phenix, Hanson, and Thornton (2003) found that offense-free time in the

community lowered the expected sexual recidivism rates of samples used to develop the Static-99. They provided adjusted estimates for the Static-99 based on time free. To provide a further test of the hypothesis that risk of recidivism is reduced by offense-free time at risk, we combined data from the three present samples to examine the relationship among VRAG score, violent recidivism, and the latency with which the violent recidivism occurred.

Method

We combined all the subjects (n = 1309) from the studies used to form the samples in Study 1 and for whom we had VRAG score, violent recidivism, total time at risk for nonrecidivists, and latency of violent recidivism for recidivists (measured in months of opportunity for the latter two). To examine violent recidivism as a function of offense-free time at risk, we adopted annual time gates between 5 and 20 years. For each gate, we included only those subjects who had at least the number of years of opportunity pertaining to that gate. For the five-year gate for example, subjects who recidivated before five years of opportunity elapsed were dropped, as were subjects who did not recidivate and had less than five years of opportunity. We computed the subsequent rates of violent recidivism for each of the standard nine VRAG categories (Quinsey et al., 2006).

Results and Discussion

The results are shown in Figure 1, where the plotted value for the first point of each function is the normative estimated probabilities of violent recidivism for ten years of opportunity (Quinsey et al., 1998, 2005) based on the 10-year base rate of violent recidivism of 43%. For the 20 subjects in the highest VRAG category (top function in Figure 1), only one did not fail within the first five years of opportunity but that subject did eventually meet the criteria for violent recidivism (within eight years). For the next two highest VRAG categories, Figure 1

shows that there was little or no evidence of a downward trend associated with longer violent offense-free periods at risk. In fact, the best-fit lines show upward trends. For five of the other six categories (i.e., all except VRAG category 2 which yielded a slight upward trend), there were reasonably clear and parallel downward trends such that as the violent offense-free period increased, the likelihood of subsequent violent recidivism decreased. The mean rates of violent recidivism and linear trend for the lower six VRAG categories are also shown in Figure 1.

The mean slope of the six functions (i.e., for VRAG categories 1 to 6) was -.0114 which could be interpreted as a 1% decrease in the likelihood of violent recidivism for each violent offense-free year at risk[3] (as long as the subject was not in the highest three VRAG categories). A different but perhaps simpler correction factor involves converting to percentile ranks first. Thus, the percentile score is reduced by one percentile for each violent offense-free year at risk and then the risk assessment is the corresponding VRAG category for the reduced percentile estimate. This latter algorithm meant that, as long as he is not in the highest three VRAG categories at the outset, an offender should be moved to the next lower VRAG category after 10 violent offense-free years at risk, and again to the next lower VRAG category after a further 15 violent offense-free years at risk. Table 5 shows example estimates (for those time gates that yielded changes in estimates) for the two possible correction algorithms. The shallow slopes of the functions in Figure 1 mean that the corrections are small and consistent between the two correction algorithms. Across all six categories, for ten subsequent years-at-risk, and time gates shown in Table 5, the intraclass correlation coefficient (absolute agreement) between the output values of the two correction algorithms was .963, $p < .001$. The passage of time was informative about the risk of violent recidivism, but only modestly, and not at all for higher risk offenders.

General Discussion

In Study 1, we hypothesized that, if the dynamic effects of aging caused a decline in risk of violent recidivism, then the age at which an offender was released or the amount of time that passed while he was incarcerated or since his first offense should be better predictors of violent recidivism than the age he was when he committed his first criminal offense. They were not. For all three samples examined, although age at release was a predictor of violent recidivism, it was consistently a worse predictor than age at first offense. In simultaneous logistic regression analyses for the prediction of violent recidivism, neither the passage of time since the first offense nor the time spent incarcerated made any independent or incremental contribution to the prediction of violent recidivism after the incorporation of the offender's age at his first offense. Age at release and the passage of time made no additional independent contribution to VRAG score in the prediction of violent recidivism. These latter results were also incompatible with the idea that the dynamic effects of aging must be incorporated into forensic violence risk assessment as long as the assessment already optimally addresses enduring antisocial proclivity.

We believe the present results suggest that, for serious violent offenders, most of the effect other investigators have attributed to aging are, in fact, due to differences between younger and older cohorts in static risk factors other than age. Specifically, we believe that age variables all indicate life-course persistent antisociality, and that age at first offense is the best of the age variables in indicating this phenomenon. We did observe a small and inconsistent independent statistical effect of age at release. One might be tempted to conclude that this, at least, was some evidence of small but detectable dynamic effects of aging, but not all of the present subjects were checked against death records and it is certain that the offenders released at older ages actually experienced less opportunity (compared to offenders released at younger ages) because more of

the older group would have died in any time span. Thus, any residual statistical effects of age at release on recidivism are confounded with age-related differential opportunity. In the present samples, any apparent dynamic effect of aging (as small and inconsistent as it was) is certainly an over-estimate[4] resulting from our data not having been corrected for differential loss of opportunity due to death (cf. Egglestone, Laub, & Sampson, 2004; Laub & Vaillant, 2000).

For the sex offenders in our study (Sample 2) we evaluated age at first offense as a replacement for age at release in the RRASOR and the Static-99. In both cases, scoring criteria were left unaltered and merely applied to the different age variable. In all instances, using age at first offense significantly improved the performance of the instruments in the prediction of violent and rapsheet sexual recidivism. Analyses strongly suggested that age at first offense would make a superior age-related item in these actuarial assessments. The results suggested that, contrary to the advice of some investigators (Barbaree et al., 2003; Hanson, 2005), advanced age should not be considered as a post-actuarial mitigating factor for serious offenders.

How should age be dealt with in risk assessment? The present results indicate that age at release could constitute a valid item in an actuarial risk assessment because of its robust association with recidivism. The present results also suggest, however, that as good or better predictive validity would be achieved by using age at index offense or age at first offense. Furthermore, the reason age at release would be found on an actuarial risk assessment is not necessarily the most intuitively obvious one. That is, the present results imply that the reason has more to do with the association among opportunity, age at release, and life-course persistent antisociality. This in turn implies that optimal actuarial risk assessment might not incorporate any age variable (even if age had a bivariate association with recidivism) because antisocial proclivity could already be captured by non-age variables (e.g., Hilton et al., 2004). Hilton and

colleagues observed a bivariate association between age and recidivism, but the bootstrapping development of an actuarial tool for wife assault recidivism did not select age as an item.

Age and Antisocial Behavior

The present conclusions seem to contradict a substantial body of longitudinal research showing that as males age, they engage in fewer antisocial (or even risky) activities. We attribute this difference first to the fact that the present samples were all adult offenders, essentially excluding the majority of all offenders – those whose antisociality is age-limited; that is, limited to adolescence (Moffit & Caspi, 2001). Second, we attribute the greatest risk to a subgroup of offenders whose violent crime is relatively age-invariant, but who comprise a small minority of the offender population and even a minority of serious adult criminals. Laub and Sampson were unable to find any subgroup (defined by non-age variables) who failed to show age-related declines, even when the highest risk 20% or even 10% were examined. Laub and Sampson also examined the data in a post-hoc manner seeking subgroups based on lifetime trajectories. A subgroup they labeled “high-rate chronic” offenders comprised 3.2% of the sample showed a late peak of violent offending, but their rate dropped to half by 50, and to almost zero by 70.

In the attempt to identify a group of high-risk offenders, however, Laub and Sampson could only examine variables gathered in the original Glueck and Glueck (1950) study. It is possible that the available variables did not include those most important in identifying the “life-course persistent” offenders (viz., Skilling, Harris, Rice & Quinsey, 2002; Moffitt, Caspi, Harrington, & Milne, 2002). Also, they only corrected for lost opportunity due to incarceration up to age 32. Laub and Sampson did provide strong evidence that most delinquents eventually exhibit a decline in violent behavior due to the effects of aging, but their analyses do not preclude the existence of a minority who show no age-related decrease in risk even to age 70.

Laub and Sampson did not have good ways to identify psychopaths. It remains possible that, had they been able to use a version of the Psychopathy Checklist, for example, they would have identified a small group of high risk offenders who did not "burn out." Recall the study by Hare and colleagues (1988; see also Harris, Rice, & Cormier, 1991; Porter et al., 2001) in which psychopaths did not exhibit age-related decreases in violent crime. Laub and Sampson did find that 3% of their delinquent sample committed a violent crime over the age of 60, and end their book concluding that their data affirm a quote by Wilson (1975, p. 209), "Wicked people exist," and, "Prisoner reentry options seem ill-suited for such hardened men (Laub & Sampson, 2003, p. 292)." We suggest that the three percent of their sample who committed violent crimes over the age of 60 were predominantly psychopaths. The present results showed that the prevalence of psychopathy among violent offenders released over age 55 was very low, but that the PCL-R continued to predict violent recidivism.

Generalization and Future Research

Given the lengths of follow-up employed, the present samples exhibited rates of violent recidivism typical of long-term studies of serious offenders released from secure custody (Quinsey et al., 2006; Rice & Harris, in press; www.mhcp-research.com/ragreps.htm). As such, the present samples were probably representative of serious male felons applying for parole, violent mentally disordered male offenders being considered for conditional release, and candidates for preventative detention under sexually violent persons and dangerous offender statutes. However, further research is required to determine the applicability of the present conclusions to other forensic populations -- misdemeanants, juvenile offenders, probationers, and female offenders. Certainly, as mentioned in the Introduction and for all forensic populations,

truly longitudinal research designs represent the best solution to the puzzle of the dynamic effects of aging on the risk of violent offending.

Adjusting Risk Assessment Based on the Passage of Time

Whether or not any age variable forms part of an actuarial risk assessment, the present results afford no empirical basis for the post-evaluation clinical adjustment of actuarial scores (or even structured professional discretion) based on an offender's having gotten older. The present results do support the adjustment of actuarial scores based on something associated with the passage of time, however. That is, the present results supported the lowering of VRAG recidivism risk estimates based on extended periods of violent offense-free behavior while at risk to re-offend (as long as the assessee is not in the three highest VRAG categories). However, the adjustment is not a clinical adjustment. Rather, the adjustment is based on the measured association among VRAG score, time spent offense-free, and violent recidivism. As such, the adjusting correction factor is as actuarial as was the original VRAG. If future research identifies serious offenders for whom adjustments to assessed risk based on the effects of aging are empirically supported, those adjustments will be actuarial (probably within an actuarial instrument) and will not comprise the subsequent application of clinical intuition.

Footnotes

[1]The HCR-20 includes an item called, "Young age at first violent incident."

[2]Although the VRAG was not designed to predict it, we examined the same questions for rapsheet sexual recidivism in Sample 2. In those analyses, VRAG score exhibited a large effect in the prediction of this outcome (Wald statistic (df = 1) = 13.43, $p < .001$, Nagelkerke R-square = .098), and age at release did not make a statistically significant incremental and independent contribution in either simultaneous or stepwise analyses.

[3]These estimates were based on an average of 10 years of subsequent opportunity. If the actual mean periods of opportunity for the subjects shown in Figure 1 were less than that (and this seems especially likely towards the right hand side of the Figure), the slopes of the functions would be even shallower. For example, estimates based on an average of seven years of subsequent opportunity yielded a mean slope of - .0091 or a correction of less than 1% per violent offense-free year at risk.

[4]In a sense, death is an age-related reduction in violence risk, but not one implied by the idea that age-related declines in violence risk are due to the dynamic effects of aging. Although we do not regard our conclusions as accepting a null hypothesis, we believe we had abundant power to detect even small (i.e., in the present samples, correlations considerably less than .20 were statistically significant) dynamic effects of aging had they been present.

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Table 1. Summary statistics and sample characteristics; means are accompanied by standard deviations (in parentheses).

	Sample		
	1.	2.	3.
Age first offense/Arrested under 16	22%	23.2 (12.2)	23.7 (11.1)
Age at index offense	31.0 (10.4)	30.4 (11.1)	27.9 (10.7)
Age at release	34.3 (8.12)	35.7 (11.6)	32.9 (11.4)
Years spent incarcerated	6.03 (4.97)	3.51 (3.03)	4.90 (4.27)
Years since first offense	8.42 (6.86)	11.18 (8.43)	8.97 (7.04)
Violent recidivism	27%	48%	43%
Separation from parents under 16	38%	60%	58%
Alcohol abuse history score*	1.60 (1.70)	3.26 (2.49)	1.89 (1.59)
Education in years	10.0 (3.3)	9.40 (2.72)	8.59 (2.60)
Never married	66%	44%	45%
Prior psychiatric admissions	7.0 (16)	.85 (2.38)	1.31 (2.32)
IQ	96 (16)	98 (16)	99 (15)

Note: *See Quinsey et al., 2006

Table 2. Variable intercorrelations for Sample 1, all statistically significant, $p < .05$, except*.

	1.	2.	3.	4.	5.	6.
1. Violent recidivism		-.230	-.215	-.178	.054*	.152*
2. Arrested under age 16 (1 = no, 0 = yes)			.227	.149	-.121	-.658
3. Age at index offense				.806	-.289	-.164
4. Age at release					.334	.263
5. Time spent incarcerated						.687
6. Time since first offense						

Table 3. Variable intercorrelations for Sample 2 above the diagonal and Sample 3 below, all statistically significant, $p < .05$, except*.

	1.	2.	3.	4.	5.	6.
1. Violent recidivism		-.310	-.280	-.207	-.062*	.061*
2. Age first offense	-.301		.767	.759	-.186	-.454
3. Age at index offense	-.246	.837		.966	-.190	.231
4. Age at release	-.263	.772	.925		.070*	.236
5. Time spent incarcerated	-.087	-.013*	.060*	.625		.367
6. Time since first offense	-.016*	-.239	.171	.399	.625	

Table 4. Correlations with PCL-R scores, all statistically significant, $p < .01$.

	Sample		
	1.	2.	3.
Age first offense/Arrested under age 16 (0=yes/1=no)	-.510	-.423	-.389
Age at index offense	-.287	-.233	-.285
Age at release	-.170	-.173	-.227
Time spent incarcerated	.198	.232	.097
Time since first offense	.424	.307	.172

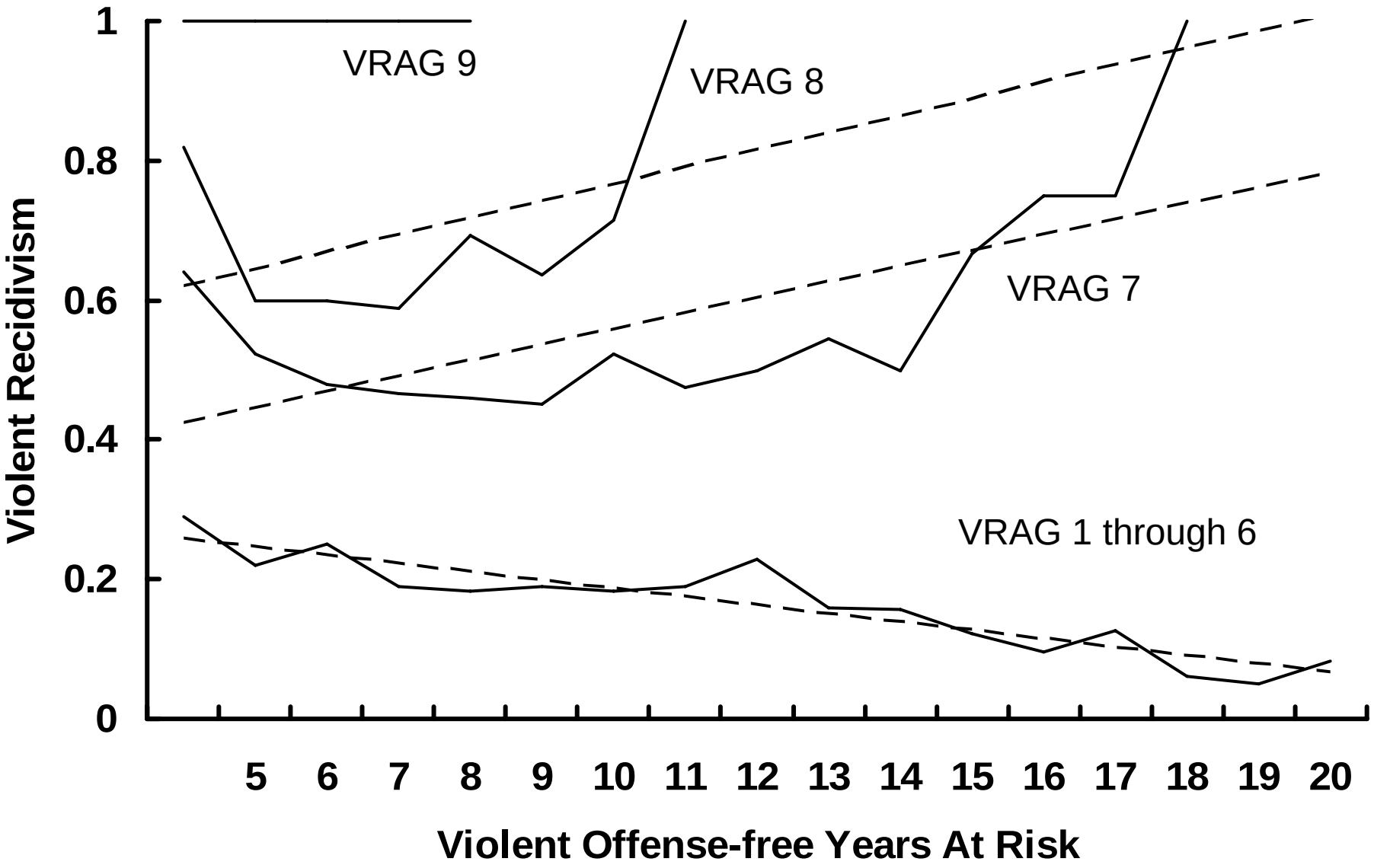
Table 5. Estimated likelihoods of violent recidivism over the subsequent ten years for example periods of previous violent offense-free years at risk for two correction algorithms.

		Violent offense-free years after release							
VRAG	**Base**	8 years		13 years		17 years		27 years	
Category	**Rate**[a]	A1	A2	A1	A2	A1	A2	A1	A2
1.	**.08**	0	.08	0	.08	0	.08	0	.08
2.	**.10**	.02	.10	0	.08	0	.08	0	.08
3.	**.24**	.16	.24	.11	.10	.07	.10	0	.08
4.	**.31**	.23	.31	.18	.24	.14	.24	.04	.10
5.	**.48**	.40	.48	.35	.31	.31	.31	.21	.24
6.	**.58**	.50	.58	.45	.48	.41	.48	.31	.31

Note: [a]The expected rate (at release) of violent recidivism over ten years of opportunity (Quinsey et al., 1998, 2005) based on an extended follow-up of the construction sample where the base rate of violent recidivism was .43. Algorithm 1 (A1) is the straight reduction of the base rate for the VRAG category by 1% for each violent offense-free year at risk. Algorithm 2 (A2) is the reduction by one percentile rank for each violent offense-free year at risk (and reference to the percentile norms for the VRAG; Quinsey et al., 2006, Appendix C).

Figure Caption

Figure 1. Rates of violent recidivism for 1309 serious offenders as a function of offense-free time at risk (see text) and lines of best fit. In order from the top of the figure, the data are subdivided into VRAG categories 9, 8, 7, and the mean of VRAG categories 1 through 6, respectively.


1
0.8
0.6
0.4
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0
Violent Recidivism
VRAG 9
VRAG 8
VRAG 7
VRAG 1 through 6
5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
Violent Offense-free Years At Risk