Risk Assessment in Habitual Offenders With Substance Use Problems: A Quasi-Prospective Study of the Predictive Validity of the HKT-30

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Abstract
The predictive validity of the Dutch risk assessment instrument HKT-30 was investigated with a quasi-prospective design in a sample of habitual offenders with a substance use disorder (SUD). The study is reported according to RAGEE guidelines. The HKT-30 is an extension of the HCR-20. Files of 89 patients were coded and recidivism data were requested from the Ministry of Justice. Total scale scores and scores of the Clinical and Future scales were significantly predictive of recidivism for 1 and 2 years of time at risk, respectively. In contrast to earlier studies into recidivism, the H-scale had no predictive value. Regression analysis showed that the Clinical and Future scales contributed to the explanation of variance in recidivism, but not independently from each other. The conclusion is that the HKT-30 is a useful instrument for discovering risk factors and predicting recidivism for the population of habitual offenders with an SUD.

Keywords
risk assessment, recidivism, risk factors, HKT-30, HCR-20, substance use, habitual offenders, quasi-prospective

Introduction
Risk assessment plays an important role in the treatment of forensic patients. It has been repeatedly shown that the accuracy of predicting relapse in violent offenders is higher

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when the risk assessment is based on structured professional judgment, instead of on clinical judgment alone (Douglas, Cox, & Webster, 1999). As far back as 1981, Monahan pleaded to perform risk assessment with the help of a checklist (Monahan, 1981). In the Netherlands, structured risk assessment is an obligatory part of diagnostics and treatment planning in forensic psychiatry. A frequently used instrument is the HKT-30 (Comité Instrumentarium Forensische Psychiatrie [CIFP], 2000) that was developed as an extension of the much used HCR-20. Similar to the HCR-20 (Webster, Douglas, Eaves, & Hart, 1997), the HKT-30 contains three subscales (see Table 1). The H-scale (Historic) contains 11 items, the K-scale (Clinical) 13 items, and the T-scale (Future) contains six items. Compared with the HCR-20, the HKT-30 gives more consideration to clinical factors and social embedding, and a more differentiated view of possible treatment needs.

Interrater reliability of total and subscale scores of the HKT-30 is good to very good, and the predictive values are reasonable and comparable with values of the HCR-20 (receiver operating characteristic [ROC] values varying from .67 to .73; Blok, de Beurs, de Ranitz, & Rinne, 2010). The HKT-30 also showed significant

| Historical and static indicators (H-scale) | Clinical and dynamic indicators (K-scale) | Future situational indicators (T-scale) |
|-------------------------------------------|------------------------------------------|---------------------------------------|
| H01 Offense history | K01 Problem recognition | T01 Agreement about conditions |
| H02 Breaching conditions about treatment and supervision | K02 Psychotic symptoms | T02 Material indicators |
| H03 Behavior problems before age of 12 years in childhood | K03 Substance use | T03 Daytime activities |
| H04 Victim of violence in childhood | K04 Impulsiveness | T04 Skills |
| H05 History of care | K05 Empathy | T05 Social support and network |
| H06 Employment history | K06 Hostility | T06 Stressful conditions |
| H07 History of substance use | K07 Social and relational skills | |
| H08 Psychotic disorders | K08 Self-support | |
| H09 Personality disorders | K09 Problems with acculturation | |
| H10 Psychopathy | K10 Attitude toward treatment | |
| H11 Sexual deviance | K11 Responsibility for the offense | |
| | K12 Sexual preoccupation | |
| | K13 Coping skills | |

Source. Werkgroep Risicotaxatie Forensische Psychiatrie (Taskforce Risk Assessment Forensic Psychiatry), 2002.
predictive values for violent recidivism in the populations of mentally disabled violent patients (van den Berg & de Vogel, 2011) and violent patients with a psychotic disorder only (Nowak & Nugter, 2014).

The study reported here concerns habitual offenders with a substance use disorder (SUD), treated in a forensic addiction hospital. The patients in this study have a history of frequent crimes. They do not commit serious violent offenses, but mainly property offenses closely bound up with substance use. Although the severely violent patients in whom the HKT-30 was studied before are clinically treated for an average of 8 years, the duration of clinical treatment for the group of patients in this study is usually several months to several years.

Although it is an obligation by the Dutch government to use the HKT-30 (or HCR-20) in forensic addiction hospitals, nothing is known of the predictive value for recidivism in the population of these hospitals. The research question of this study was therefore whether the HKT-30 total and subscale scores predict general recidivism in a sample of habitual offenders with an SUD who are clinically treated in a forensic addiction hospital. Because the offense history of the patients consisted mainly of property crimes, and violent offenses almost always occurred in the context of these crimes, we combined violent and nonviolent recidivism.

### Method

#### Subjects

The files of habitual male SUD offenders who were treated between 2008 and 2013 in treatment facility “Tactus Addiction Treatment” in the east of the Netherlands were coded for this study. Files were selected beginning with patients who had been discharged 2 years before, working backward. The last patient selected was discharged 6 years and 8 months ago at the moment of selection. Inclusion of older files was not useful because they did not contain sufficient information to score the HKT-30. Of the 105 selected files, 11 files were left out because they did not contain enough data. Three patients turned out to be untraceable in the Documentation center and two more HKT-30s turned out to have too much missing data to include them into the analysis. Therefore, the final sample consisted of 89 patients.

The subjects received coercive in-patient integrated treatment, after incarceration or as (partial) replacement of incarceration. The treatment consisted of interventions for forensic, addiction-related, and psychiatric problems. The duration of treatment varied between 15 days and almost 5 years ($M = 13.5$ months, $SD = 15.0$). The mean age at the start of hospitalization was 36.4 years ($SD = 7.5$) and most patients were single (57.3%). The greater part (79.8%) had the Netherlands as country of origin, 10.1% was North African, and 10.1% had another origin. In the sample, 88.8% had more than one *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*; American Psychiatric Association, 1994) classification for SUD. For 46.1% of the subjects, the main substance was cocaine; for 25.8%, alcohol; and for 16.9%, cannabis. Mean number of offenses for which the patients were
convicted before treatment was 62 ($SD = 41.5$). Twenty-one percent of the offenses concerned—relatively mild—acts of violence such as burglary with violence and assault. Almost all patients (93.6%) committed at least one violent offense.

**Procedure**

This study used a quasi-prospective follow-up design. The HKT-30 was scored on the basis of files of formerly treated patients. The study was approved by the Dutch Ministry of Justice, who provided recidivism data of the subjects after the files were coded.

The second author, a trained clinical psychologist, scored the HKT-30 on the basis of the information in the files, which usually consisted of reports from therapists (psychologists) of the clinic and former reports from Dutch Justice or other institutes that treated the patients, such as mental health care centers.

Four of the 11 items of the H-scale were not scored in this study. As the forensic addiction hospital in this study does not include patients with a psychotic disorder, apparently psychopathic patients, and sex offenders, Items *H08 Psychotic disorders*, *H11 Sexual deviance*, and *H12 psychopathy* were left out. Besides, Item *H09 Personality disorders* was left out because there were no systematic evaluations of these disorders available. The date and category (Brand, 2005) of first offense(s) after treatment were registered (Table 2).

**Statistical Analyses**

Pearson’s correlations were calculated between the subscales and total scores of the HKT-30. To calculate recidivism rates, survival analysis (Kaplan–Meier method) was used.

Receiver operating characteristic (ROC) analyses were carried out to calculate the predictive validity of the HKT-30. The area under the curve (AUC) is a measure of the

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**Table 2. Categories and Types of Recidivism.**

| Category | Description |
|----------|-------------|
| 1        | Traffic and disruption of public order |
| 2        | Drug-related offenses |
| 3        | Destruction of property |
| 4        | Property crime |
| 5        | Medium serious violent offenses and illegal possession of weapons |
| 6        | Property crime accompanied with violence |
| 7        | Serious violence |
| 8        | Sexual offense |
| 9        | Sexual offense (underage victim) |
| 10       | Manslaughter |
| 11       | Arson |
| 12       | Murder |

*Note. Classification according to Brand (2005).*
predictive validity. AUCs of .65, .70, and .80 are considered to indicate modest, acceptable, and excellent predictive validity, respectively (Chu, Daffern, & Ogloff, 2013). Time periods of 1 and 2 years since release were chosen as times at risk, because all patients had had a minimum of 2 years in which they could recidivate. To determine which offenses occurred within the time at risk, the actual date of the offense was taken. This period was not compensated for doing time in prison because no one was sentenced for more than a few weeks. Subsequently, a Cox regression analysis was performed on the 2-year recidivism data to build a multivariate model of the predictors of recidivism. The corresponding hazard ratio can be interpreted as the relative risk for recidivism. After analyzing the univariate relations between predictors and (time to) recidivism, variables with $p < .20$ were entered into a full multivariate model. Subsequently, the nonsignificant variables were sequentially removed until the $R^2$ value changed by more than 10%.

Data were analyzed using SPSS version 21 for Windows. Results are reported according to RAGEE guidelines (Singh, Yang, Mulvey, & RAGEE Group, 2015).

**Results**

Figure 1 shows the survival curve for recidivism. Thirty-seven patients recidivated within 1 year after discharge; 14 more patients recidivated the second year after
discharge. So after 2 years, 51 (57.3%) patients had recidivated. Of the total sample, 71.9% patients were reconvicted for any offense (violent or nonviolent) at the end of their respective follow-up periods, varying from 34 to 85 months. The most common offenses were property crimes (87% of the reoffenders), but many traffic and public disorder offenses were also registered (48%). Three patients committed violence crimes with severe injuries. No patients were convicted for a serious crime in Categories 8 to 12 (Table 2).

The correlations between the HKT-30 total and subscale scores varied from .47** to .90***. The K-scale and the T-scale showed a correlation of .70** (Table 3).

Table 4 shows the AUCs for reconviction within 1 year and 2 years after leaving the hospital. The AUCs of the total HKT-30 scores and the two dynamic subscales are the highest for the first year after treatment: .72 for the total score, .70 for the K-scale, and .69 for the T-scale. For the time at risk of 2 years, the AUCs have a somewhat lower value, .67, .66, and .67, respectively. The H-scale did not have significant predictive values for either time at risk.

In the stepwise Cox regression, the H-scale had a nonsignificant (p = .65) univariate correlation with recidivism and was not entered in the multivariate model. The scale total scores, and the K-scale and the T-scale scores had significant univariate values and were entered in the model. The K-scale and the T-scale combined in a model, did not contribute independently to the prediction of recidivism, due to a

| Measure       | H-scale | K-scale | T-scale |
|---------------|---------|---------|---------|
| Total score   | .472**  | .861**  | .895**  |
| H-scale       | .116    | .186    | .703**  |
| K-scale       |         | .703**  |         |

**p < .01.

Table 3. Intercorrelations Between the Total- and Subscales of the HKT-30.

| Measure | AUC  | p     | SE   | 95% CI   | AUC  | p     | SE   | 95% CI   |
|---------|------|-------|------|----------|------|-------|------|----------|
| Total score | .72*** | .001  | .057 | [.60, .83] | .67** | .007  | .061 | [.40, .67] |
| H-scale  | .57  | .243  | .062 | [.45, .70] | .54  | .59   | .069 | [.54, .80] |
| K-scale  | .69** | .003  | .058 | [.56, .80] | .66* | .013  | .060 | [.55, .78] |
| T-scale  | .70** | .002  | .058 | [.59, .81] | .67* | .010  | .062 | [.56, .80] |

Note. ROC = Receiver operating characteristic; AUC = area under the curve. * = p<.05, ** = p<.01 ***= p<.001
high correlation (Table 3). In the final model, only the K-scale remained ($\beta = .092$, $p < .000$).

**Discussion**

This study examined the predictive validity of general recidivism of the risk assessment instrument—the HKT-30, an extension of the HCR-20, in a population of habitual offenders with an SUD. The results suggest that the total HKT-30 score has an acceptable predictive validity (with AUCs ranging from .72 to .67 for 1 and 2 years of time at risk, respectively) for the prediction of general recidivism in habitual offenders with an SUD. The dynamic items that evaluate functioning during treatment (K-scale) and the future social situation (T-scale) of the patient also showed acceptable predictive values. The results for the total and subscale scores are similar to results reported in other studies on the HKT-30 (Blok et al., 2010).

Remarkably, the H-scale of the HKT-30 turned out to have no significant predictive value. This finding is in contrast with research on the predictive value of historic items in general (e.g., Quinsey, Harris, Rice, & Cormier, 2006). Several explanations can be given for this result. In the first place, as noted before, four of the 11 items of the H-scale were not scored in this study. From these left-out items only *Psychopathy* has a substantial relationship with recidivism (Hildebrand et al., 2005). This item is one of the strongest predictors in other studies on the HKT-30 (as well as in the HCR-20). The question whether this would also be the case for habitual offenders with an SUD cannot be answered by this study, because the Addiction Treatment Center where the study was carried out does not accept apparently psychopathic patients. Second, it is important to note that for our sample of habitual offenders, variance in *Offence history*, being also a major predictor in former studies in the HKT-30, was very limited, with a mean of 3.70 on a scale from 0 to 4. So the H-scale of the HKT-30 may not be optimally suitable for this population, and other, more addiction-related, historic aspects would be more useful in terms of predictive validity, such as multifaceted use (Larney & Martire, 2010), the interweaving of substance use with criminality (Bennett, Holloway, & Farrington, 2008), and the question whether (especially violent offenses were committed under the influence of psychoactive substances (Lynch, 2014).

In the multivariate model developed in this study, the K-scale and the T-scale were significant predictors of reoffending. This emphasizes the importance of monitoring the behavior of patients during treatment, and linking treatment goals to the risk factors that emerge from the risk assessment. The significance of the T-scale accentuates that it is important in addiction care to have insistent attention for the social situation to which the patient returns after treatment. Possibly, adding more addiction-related variables to the K- and T-scales can improve the predictive power of the instrument for an addicted population, for example, whether the patients themselves acknowledge the relationship of their criminal activities with their SUD, whether there are many individuals with an SUD in their social network, and an estimation of the chance that the patient will relapse in problematic substance use.
This study has several limitations. First, the study was based on retrospectively studied patient files, which were not always complete. Second, only a single rater scored the files. Having had two independent raters would have been ideal, but because the HKT-30 is known to have a good to very good interrater reliability, this limitation is not likely to have impacted the results a lot.

In conclusion, the HKT-30 is a useful instrument for predicting general recidivism and discovering risk factors in the population of habitual offenders with an SUD. The predictive value in this population is comparable with that of the value for serious violent offenders with mental health problems. An important issue for further research is whether there are specific addiction-related risk factors for the population of habitual offenders with an SUD, such as the ways in which addiction and offense behavior are interwoven. Equally important for future research is the question to what extent reoffending is linked with the persistence of the SUD.

Declaration of Conflicting Interests
The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding
The author(s) received no financial support for the research, authorship, and/or publication of this article.

Note
1. Recently replaced by the HKT-R (Spreen, Brand, Ter Horst, & Bogaerts, 2013) and HCR-20v3 (Douglas, Hart, Webster, & Belfrage, 2013), respectively.

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