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Dynamic risk assessment of sexual offenders in the real world : study of predictive validity and dimensionality of the Static-99R and Stable-2007 on a French-speaking Canadian sample

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Dynamic risk assessment of sexual offenders in the real world : study of predictive validity and dimensionality of the Static-99R and Stable-2007 on a French-speaking Canadian sample

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Résumé

La première étape de cette étude vise à évaluer, selon les données de terrain, la validité prédictive des outils les plus utilisés quant à prédire le risque de récidive auprès des délinquants sexuels, soit la Statique-99R et la Stable-2007. Au cours de la première étape de cette étude, la validité prédictive de la Statique-99R et de la Stable-2007 a été évaluée via les données d'expertise d'un échantillon d'un échantillon de 797 délinquants sexuels hommes. Ces données ont été obtenues par la recension des archives du Centre d'Intervention en Délinquance sexuelle (CIDS) au Québec, Canada, de 1998 à 2021 et pairées aux données officielles de récidive obtenues par la Sûreté du Québec pour la même période. Les scores totaux et les niveaux de risques évalués par la Statique-99R prédisaient significativement la récidive générale, sexuelle et violente (non-sexuelle). Bien que cela n'ait pas été le cas pour la Stable-2007, cet outil contribuait à prédire, lorsqu'ajoutée à la Statique-99R, la récidive générale, sexuelle et violente (non-sexuelle) pour ces trois types de récidive. La seconde partie de cette étude s'intéressait aux dimensions latentes de ces instruments. Les analyses factorielles exploratoire ont permis de relever 3 dimensions pour la Statique-99R, soit Jeune/Célibataire, Persistance (sexuelle et non-sexuelle) et Conduite de Prédation détachée, similaires à certain de ceux identifiés par Barbaree et al. (2006). Pour la Stable-2007, deux dimensions ont été identifiées, soit la présence de Caractéristiques antisociales et la Déviance sexuelle. Toutefois, aucune des dimensions extraites pour la Statique-99R et la Stable-2007 ne permettait de prédire significativement la récidive sexuelle. L'interprétation de ces résultats, les limites de cette étude et les implications possibles pour de plus amples recherches sont discutées.

Mots-clés : évaluation du risque, délinquants sexuels, Statique-99R, Stable-2007, dimensionnalité.

Abstract

The first phase of this study aimed to evaluate, based on field data, the predictive validity of the most used tools for predicting the risk of recidivism among sexual offenders, the Static-99R and the Stable-2007. Predictive validity of the Static-99R and the Stable-2007 was firstly assessed using legal expertise data from a sample of 797 male sex offenders. These data were obtained by reviewing the archives of the Centre d'Intervention en Délinquance sexuelle (CIDS) in Quebec, Canada, from 1998 to 2021 and matched with official recidivism data obtained by the Sûreté du Québec for the same period. The total scores and risk categories assessed by the Static-99R significantly predicted general, sexual, and violent (non-sexual) recidivism. Although this was not the case for the Stable-2007, scores and risk categories from the Stable-2007, when added to the Static-99R, helped predict general, sexual, and violent (non-sexual) recidivism for all three types of recidivism. The second part of this study focused on the latent dimensions of these instruments. Exploratory factor analyses identified 3 dimensions for the Static-99R, namely Youth/Single, Persistence (sexual and non-sexual), and Detached Predatory Conduct, similar to some of those identified by Barbaree et al. (2006). For the Stable-2007, two dimensions were identified, which were Antisociality and Sexual Deviance. However, none of the dimensions extracted for the Static-99R and the Stable-2007 significantly predicted sexual recidivism. The interpretation of these results, the limitations of this study, and possible implications for further research are discussed.

Keywords: risk assessment, sex offenders, Static-99R, Stable-2007, dimensionality.

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Liste des sigles et abréviations

1. AUC : Area under curve

2. CIDS: Centre d'Invervention en Délinquance Sexuelle

3. CFI : Comparative fit index

4. SORAG : Sex Offender Risk Appraisal Guide

5. VRS-SO: Violent Risk Scale – Sexual Offenders

6. MnSOST-R: Minnessota Sex Offender Screening Tool – Revised

7. RMSEA: Root mean square error of approximation

8. ROC: Receiver-Operation Characteristic

9. TLI: Tucker-Lewis Index

Introduction

At every stage of the criminal justice system, monitoring the risk of criminal recidivism remains an essential issue in decision-making, whether it is a matter of conducting a pre-sentence investigation, determining the sentence, setting guidelines for parole or ensuring appropriate treatment for offenders. These decisions can have significant consequences, as they may result in individual's liberty deprivation, important costs inherent to incarceration, and must take into account the safety of the general population while maintaining decision-maker's accountability in the event of recidivism. To this end, the assessment of the risk of recidivism is a key source of information, whether it is to justify decisions or to ensure that resources are allocated to the offenders with the greatest needs, as the resources of the justice and correctional system are, as we know, limited (Wolf, 2009). In this regard, sexual recidivism is an issue of ongoing concern at several levels of penal trajectory. Sexual offences are still subject to penal measures distinguishing them from other crimes (Bonnar-Kidd, 2010), such as the *Sex Offender Information Registration Act* in Canada. Additionally, supervision and monitoring of sex offenders in the community remains an issue of concern, and often a source of negative bias to the general population (Caputo & Brodsky, 2007; Comartin, Kernsmith & Kernsmith, 2009; Levenson, Brannon, Fortney & Baker, 2007). Hence, sexual recidivism continues to receive media attention (Blasko, 2016; Shackley, Weiner, Day & Willis, 2014), although the risk of recidivism for sex offenders tends to be under 15% for any type of recidivism for the 5 years following the release into the community after he commission of a sexual offense (Helmus, Hanson, Thornton, Babschisin & Harris, 2012; Harris & Hanson, 2004). However, concerns are also supported by numerous studies and victimization data showing significant rates of unreported sex offenses (Perreault & Breenan, 2010). Moreover, the growing concern in Quebec towards victimization includes a critical look at the justice system, not

only towards the judiciary system itself, but also regarding the procedures related to the management of sexual offenders such as sentencing, as sexual victimization denunciations increase (Ministère de la Sécurité Publique du Québec, 2017; Statistics Canada, 2021). These questions remind us of the importance of rigorously documenting all decisions related to the management of sex offenders to prevent recidivism, and thus future sexual victimizations.

Risk assessment

Over the past five decades, knowledge about the prediction of criminal recidivism in general has grown considerably (Andrews,Bonta & Wormith, 2006; Quinsey, Rice & Harris, 1995). In this regard, Andrew and Bonta (2010) described 3 phases, or generations, of recidivism risk prediction tools. The *first generation* of risk assessment tools is unstructured clinical judgment, which is the prediction of risk hypothetically determined by an experienced clinician, based on their experience and clinical judgment (Grove, Zald, Lebow, Snitz & Nelson, 2000). Numerous studies have shown unstructured clinical judgment has poor predictive validity (Gendreau, Little & Goggin, 1996; Dawes, Faust & Meehl, 1989; Meehl, 1954), sometimes even equivalent to chance (Bengston & Långström, 2007; Grove & Meehl, 1996; Grove & al., 2000). The *second generation*, actuarial measures, involve the objective evaluation of characteristics which are statistically and empirically related to recidivism, but not necessarily conceptually related to it; hence actuarial why instruments are often designated as atheoretical instruments (Andrews & Bonta, 2010). These methods involve the objective assessment of data most often derived from official data such as age or criminal history (Bonta, 2002). The *third generation* of tools adds the assessment of fluctuating, changeable elements correlated to recidivism, *dynamic* risk factors, defined below, and generally adds structured clinical judgment (Heffernan, Wegerhoff & Ward, 2019; Miller, 2006). For instance, the use of structured clinical judgment can take place as actuarial assessment of dynamic factors

may solicit the expertise of evaluators, whether to diagnose antisocial personality traits or to identify a paraphilia (Andrews & Bonta, 2006; Miller, 2006). Furthermore, the literature to date shows strong support for the use of actuarial methods in predicting general, violent and sexual recidivism (Grove & al., 2000; Helmus & Babchishin, 2017; van den Berg, Smid, Schepers, Wever, Van Beek, Jannessen & Gijs, 2018).

Items assessed by second- and third-generation methods correspond to recidivism risk factors, i.e., individual aspects statistically correlated with the occurrence of recidivism. As defined by Andrews and Bonta (2006), risk factors can be broken down into different degrees of potential change over time, and are therefore subdivided as *static* or *dynamic* risk factors. Static risk factors include elements that are unchanging at the time of the assessment and stable over time, such as an offender's past criminal history. They are most often derived from objective sources, mostly from official sources such as criminal records, and generally do not require an interview with the person being assessed (Helmus & Babchishin, 2017). However, static factors, by their so-called unchanging nature over time, would not allow for the a priori identification of intervention targets aimed at preventing recidivism (Andrews & Bonta, 2006), even if it is suggested static factors effects on recidivism such as age could change over time (Hanson, Harris, Helmus & Thornton, 2014). *Dynamic* risk factors include risk factors that could be subject to change in the medium or long term and can be the object of interventions aimed at reducing the risk of recidivism. Dynamic risk factors can also be referred to as *criminogenic* needs, as defined by Andrews and Bota (2006) as factors to be targeted for clinical intervention. These are to be distinguished from non-criminogenic needs (e.g., low self-esteem, difficulty empathizing with others) for which treatment generally do not reduce the risk of recidivism (Hanson & Morton-Bourgon, 2007). Dynamic risk factors include two subcategories: *dynamic-stable* and *dynamic-acute* risk factors. *Dynamic-stable*

risk factors are medium- to long-term changes that remain crystallized, such as pro-criminal attitudes (Douglas & Skeem, 2005). Diminishing *dynamic-stable* risk factors effect on recidivism is therefore inherent to interventions and a sufficient duration of those interventions (Lowenkamp & Latessa, 2005). *Dynamic-acute* risk factors are transient or contextual risk factors, likely to change or evolve rapidly, and possibly to present shortly before and change shortly after a recidivism, as their identification would allow for the detection of a period of high risk and the adjustment of supervision accordingly (Babschishin and Hanson, 2020). With regards to predicting recidivism based on static or dynamic risk factors, it should be remembered that the use of actuarial methods requires the consideration of all the risk factors assessed rather than individual risk factors when predicting recidivism. With respect to the utility of risk assessments in guiding treatment targeting recidivism prevention, Bonta and Andrews (2007) argue that interventions targeting levels of risk (Andrews, Bonta & Hodge, 1990), and criminogenic needs - or dynamic risk factors - would ensure effective outcomes (Andrews & Bonta, 2010; Andrews, Bonta & Wormith, 2006; Lowenkamp, Latessa & Holsigner, 2016).

Predicting recidivism among sexual offenders

With regard to sexual recidivism specifically (Anderson & Hanson, 2011; Beech, Fisher & Thornton, 2003; Brankley, Babschishin & Hanson, 2021 Eher, Olver, Heuriz, Schilling & Rettentberger, 2015; Harris, Mazerolle & Knight, 2009), research over the past 20 years has also tended to support the use of actuarial methods to predict sexual recidivism (Barbaree, Seto, Langton & Peacock, 2001; Beech, Fisher, & Thornton, 2003; Craig, Beech & Cortoni, 2013; Hanson & Morton-Bourgon, 2007; Harris, 2006; Marshall, 1996; Helmus & Babschisin, 2017), including static and dynamic risk factors (Hanson & Thornton, 2000; Thornton, 2002; Thornton, 2021). Hanson & Morton-Bourgon's (2009) meta-analysis of 118 studies on predicting recidivism among

sexual offenders showed that actuarial, empirically derived measures had the most accurate results. Hence, risk assessment studies tend to be more recent and less voluminous than that on general recidivism (Craig, Browne, Stringer & Beech, 2005; Craig & al., 2013), although the volume of work on this topic has increased greatly over the last decade (Brouillette-Alarie et Hanson, 2017). Several actuarial tools have been documented to predict sexual recidivism, including the Static-99 (Hanson & Thornton, 1999), the Risk-Matrix-2000 (Thornton, Mann & Webster, 2003), the Sex Offender Risk Appraisal Guide (SORAG; Quinsey, Rice & Harris, 1995) the Violent Risk Scale-Sexual Offenders (VRSO; Olver, Wong, Nicholaichuk & Gordon, 2007; Snowden & Olver, 2011) or the Minnessota Sex Offender Screening Tool-Revised (MnSOST-R: Epperson, Kaul, Huot, Hesselton, Alexander & Goldman, 1998). To this date, the most commonly used assessments in predicting recidivism among sexual offenders are the Static-99R (Hanson & Thornton, 2000), which assesses static factors related to recidivism, and the Stable-2007 (Hanson, Harris, Scott & Helmus, 2007a); Hanson, Harris, Scott & Helmus, 2007b)) evaluating dynamic risk factors (Bourgon, Mugford& Coligado, 2018; Kelley, Ambroziak, Thornton & Barahal, 2020).

The Static-99R (Helmus, Thornton & Babchisin, 2012), a revised version of the Static-99 (Hanson & Thornton, 2000; Hanson & Bussières, 1998), is an actuarial tool assessing 10 static risk factors predicting sexual recidivism. This instrument includes items assessing demographic status, offending history, and characteristics of previous victims, among others. Static-99, its predecessor, (Anderson & Hanson, 2011; Hanson & Anderson, 2020; Hanson & Thornton, 2000; Hanson & Thornton, 1999) was developed from the Rapid Risk Assessment for Sexual Offence Recidivism (RRASOR; Hanson, 1997). The total Static-99R scores can be converted into one of 4 categories: low, medium-low, medium-high, and high. The most recent scoring rules recommended that, in order to increase the accuracy of the Static-99R, the total score should be converted into one of

five categories, which are low, moderate-low, moderate, moderate-high and high (Phenix, Fernandez, Harris, Helmus, Hanson & Thornton, 2016). In general, the literature suggests that the Static-99R would show moderate predictive validity (Hanson & Anderson, 2020; Hanson, Helmus & Harris, 2015; Helmus, Kelley, Frazier, Fernandez, Lee, Rettenberger & Boccaccini, 2022; Hanson & Morton-Bourgon, 2007; Helmus, Hanson, Thornton, Babchishin, & Harris, 2012; Harris, 2006), as would the previous version, the Static-99 (Barbaree, Seto, Langton, & Peacock, 2001; Hanson & Anderson, 2009; Hanson & Thornton, 2000é Rettenberger, Haubner-Maclen & Eher, 2013; Screenivasan, Garrick & Norris, Cusworth-Walker, Weingerger, Essres, …, & Fain, 2007). For instance, results from a study by Hanson & al. (2015) on a sample of 768 community sex offenders followed for 7 years showed, following Receiver-Operator Characteristics (ROC) curve analysis, an area under the curve (AUC) of .68 to .80 for sexual recidivism, respectively for incomplete and complete evaluations on a 7-year period. Similarly, the meta-analysis by Helmus, Hanson, Thornton Babchisin, and Harris (2012) based on 23 samples from a total of 63 studies showed moderate to high predictive validity of the Static-99R, as results indicated fixed effect AUC value of .639 for sexual recidivism. More recently, Brankler, Babschisin, and Hanson's (2021) meta-analysis of 21 studies also supported the predictive validity of the Static-99R in predicting general, violent, or sexual recidivism.

The Stable-2007 (Hanson & Harris, 2001; Hanson, Harris, Scott & Helmus, 2007) consists of 13 dynamic risk factors that assess 5 aspects, namely significant social influences, self-regulation in general, sexual regulation, intimacy deficits and cooperation with supervision (Hanson & al., 2007; Hanson & Harris, 2010; Hanson & Harris, 2000). The Stable-2007 is derived from a revision of the SONAR (Hanson & Harris, 2001), and then the Stable-2000 (Hanson & Harris, 2001), developed empirically following the collection of items via quantitative literature

review, interviews and items present in existing assessment tools (Hanson & Harris, 2001). The results of the Dynamic Supervision Project, led by the same authors, included a review of the Stable-2000 that focused on predictive validity via a prospective design, and contributed to producing a revised version of this tool by excluding the dimension called "attitudes" which was not a strong predictor of sexual recidivism (Hanson & al. 2007). This revised version corresponds to Stable-2007 (Hanson & al., 2007). It should be noted that the scoring rules for this tool prescribe that the Stable-2007 be paired with a tool assessing static factors of sexual recidivism (Fernandez, Harris, Hanson & Sparks, 2014; Hanson & al., 2007; Hanson & al., 2001). The Stable-2007 total score can be associated with one of three risk categories: low, moderate, or high, and should be pair with an instrument assessing static risk factors (Fernandez & al., 2014). Current literature supports the use of the Stable-2007, and mostly show significant predictive validity in predicting sexual recidivism (Brankley, Babchishin & Hanson, 2021; Eher, Matthes, Schilling, Haubner-MacLean & Rettentberger, 2012; Etzler, Eher & Rettenberger, 2020). In this regard, the Hanson & al. (2015) study indicated moderate to high AUC values for the Stable-2007 in predicting sexual recidivism, showing AUC values of .67 for incomplete assessments and of .76 for complete assessments. Some studies did not show similar results, however, as the study by Eher, Olver, Heurix, Schilling, & Rettenberger (2015) of a sample of 189 sex offenders diagnosed with pedophilia and convicted of sex crimes against child victims, that showed that the Stable-2007 showed neither significant predictive validity nor incremental validity when added to the Static-99R. Furthermore, Snowden and Olver's (2017) study comparing the VRS-SO and the Stable-2007 in a sample of 180 incarcerated sex offenders in Canada did not predict recidivism in general, with the authors suggesting that the Stable-2007 may be less predictive of recidivism for high-risk offenders (Snowden & Olver, 2017). However, Looman, Goldstein, Abbott & Abracen's (2021) study of a total of 442 sex offenders showed that the Stable-2007 predicted sexual recidivism for

both sex offenders with average levels of risk and as well as for those who were incarcerated and showed higher levels of risk. More recently, however, the meta-analysis by Brankler, Babschisin, and Hanson (2021), which included a total of 21 studies (N = 6,955), showed that the Stable-2007 significantly predicted risk for general, violent, and sexual recidivism, and specifically showed an AUC value for the direct effect of the Stable-2007 score on sexual recidivism of .674. Although the results concerning the predictive validity of the Stable-2007 are not absolutely constant, it should be remembered that the scoring rules prescribe that this instrument be paired with an instrument assessing static risk factors (Fernandez, Harris, Hanson & Sparks, 2014), therefore evaluating predictive validity of the Stable-2007 on its own would be limited. Regarding the incremental validity of the Stable-2007, work to date also tends to suggest that the Stable-2007 adds to the predictive validity of the Static-99R (Harris, 2021), as well as the Static-99 (Eher, Matthes, Schilling, Jaubner-MacLean & Rettenberger, 2012). For instance, the results of the Hanson & al. (2015) study showed that Stable-2007 incrementally added to the predictive validity of Static-99R. In contrast, the study by Sowden and Olver (2017) showed that the Stable-2007 contributed to better prediction of general recidivism and violent recidivism, but did not show significant results for sexual recidivism, Eher et al.'s (2012) study where the Stable-2007 was paired with the SORAG. Brankler et al.'s (2021) meta-analysis also showed that the Stable-2007 had significant incremental validity indicators for all types of recidivism when paired with the Static-99R.

The predictive validity of both the Static-99R and Stable-2007 is shown by a significant number of researches, as mentioned above. However, the majority of these have been carried out in a research context, where the inter-judge fidelity of the raters has been controlled, and the inter-judge fidelity is evaluated (Edens & Boccaccini, 2017). Research conditions may not be as representative

of those in which risk assessment tools are usually used, where clinicians are not systematically evaluated for inter-judge fidelity and adherence to the most recent scoring rules (Boccaccini, Murrie, Mercado, Quesada, Hawes, Rice & Jeglic, 2012; Edens & Boccaccini, 2017), and where biases and pressures related to the judicial process may occur (Jackson & Hess, 2007). To our knowledge, only one meta-analysis (Helmus, Hanson, Murrie & Zabarauckas, 2021) identified predictive validity studies of the Stable-2007 and Static-99R in a field setting, and included a sample of 15 field studies conducted from 2013 to 2021 (Helmus & al., 2021). Both Static-99R and Stable-2007 showed moderate to high AUC values when evaluating predictive validity for general, violent and sexual recidivism (Helmus & al., 2021). Hence, the scarce number of field studies to this day show the need to solidify the body of studies assessing the predictive validity of sexual recidivism assessment based on data used in the field, as risk assessment instruments were also intended for practitioners and subsequent decision making occurring daily outside the control of research setting.

Beyond limitations for field studies, the Static-99R and Stable-2007 are also affected by criticisms targeting actuarial measures of recidivism risk, particularly with sex offenders. From a more theoretical point of view, some authors point out that actuarial methods do not clearly identify constructs and causal mechanisms leading to recidivism among sex offenders (Hannah-Moffat, 2005; Rogers, 2000). Silver and Miller (2005) even state that: "The abandonment of efforts to identify the origins of deviance (and to correct them) seems an inevitable by-product of the use of actuarial tools". Under clinical perspective, some authors suggest that actuarial risk assessments, by their atheorical and nomothetic nature, would be devoid of idiosyncratically adapted clinical information, which could adequately guide treatments to prevent recidivism (Monahan & Skeem, 2016; Smucker & Losel, 2016). It is also suggested that they do not clearly indicate which specific

risk factors should be targeted in priority to prevent recidivism (Hannah-Moffat, 2016; Lussier & Davies, 2011). Hence, several studies show that some instruments predicting sexual recidivism, although they have been validated with several different populations, persist in showing differences in predictive validity between different subgroups of sexual offenders (Helmus & al., 2012). For example, few studies suggest that risk assessment predictive validity could show some variations across different ethnicities, when comparing aboriginal and non-aboriginal sex offenders (Babchishin, Blais & Helmus, 2012), or between other subgroups such as Caucasian, Black and Hispanic offenders (Långström, 2004; Varela, Boccaccini, Murrie, Caperton & Gonzalez, 2013). The reason of these variations remains to be clarified as it is not consistently found in literature to this date (Helmus, Babchishin & Blais, 2012; Lee & Hanson, 2017). Hence, some studies also suggest that item-response patterns, such as pedophilic interests or antisociality, could significantly differ across different ethnic subgroups (Lee, Hanson & Blais, 2020), while these differences could not be showed by total scores. Additionnaly, some studies show variability in terms of sexual offending typology (Bartosh, Garby, Lewis & Gray, 2003). For instance, several studies show indicators of predictive validity differing between offenders designated as child molesters and those designated as rapists (Bartosh & al, 2003; Parent, Guay & 2011; Rettenberger, Matthes & Boer, 2010). Finally, the literature to date is unclear as to whether it is recommended (Lehmann, Hanson, Babchishin, Gallasch-Nemitz, Biedermann & Dahle, 2013) or not recommended (Seto, 2005) to average the results of different risk assessment tools measuring the same type of recidivism for sex offenders, but that can often produce different results (Barbaree, Langton, & Peacock, 2006a). Thus, these criticisms can be summarized in three aspects: conceptually, by limiting the understanding of recidivism by their atheoretical nature; clinically, when the results do not capture the clinical aspects and specific issues to be prioritized in order to prevent recidivism; and finally,

empirically, when differences in predictive validity between subgroups of sex offenders for several instruments need to be clarified

Predicting sexual recidivism: dimensionality issues

Actuarial risk assessment instruments, including those predicting sexual recidivism, are mostly constructed in an atheoretical manner and contain items selected according to the strength of their statistical link with the occurrence of recidivism, which compromises the possibility of assessing construct validity (Nunes & Babchishin, 2012), and would fail to explain causal mechanisms to recidivism or to precisely guide treatment targeting recidivism prevention (Rogers, 2000). However, the answer to these limitations may lie in the study of the lateqnt dimensions underlying the risk factors assessed by these instruments, these dimensions conceptualized as psychological characteristics correlated to risk (Craig Thornton, Beech & Browne, 2007; Eher, Olver, Heurix, Schilling & Rettenberger, 2005; Nunes & Cortoni, 2008; Walters, Deming & Elliot, 2009). Thus, the extraction of latent dimensions could explain some differences between the results of the instruments or those of different sexual offender types, if they are not weighted in the same way (Brouillette-Alarie & al., 2014; Doreen, 2004; Lee, Hanson, Calkins & Jeglic, 2020; Mann & al., 2010; Prentky & Knight, 1991). To this end, several authors conceptualize risk factors as an indicator of psychological dimensions predisposing or promoting criminal recidivism. In this regard, Brouillette-Alarie et al (2016) conceptually compare risk factors and their latent dimensions to the symptoms and illnesses associated with them. These dimensions are also conceptually defined by Beech and Ward (2004) as psychological traits that may be linked to the risk of sexual or general recidivism. The study of latent dimensions could also contribute to reviewing the distinctions between static and dynamic risk factors. It has been suggested by some authors that static risk factors should be conceptualized as past indicators of psychological characteristics that

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predict recidivism (Craig; Mann, Hanson & Thornton, 2010). Similarly, Beech and Ward (2004) suggest that the boundaries between static and dynamic factors may not be as impermeable as currently conceptualized (Beech & Ward, 2004; Doreen, 2004). More specifically, they suggest that static and dynamic risk factors could represent different manifestations of the same latent dimensions, i.e., the same psychological dimensions related to recidivism (Beech and Ward, 2004; Mann, Hanson & Thornton, 2010). This understanding of static and dynamic factors was empirically supported by Brouillette-Alarie & Hanson (2015) where results showed convergence between Static-99R, Static-2002R and Stable-2007 in extracting the same three underlying dimensions, which were "Sexual Delinquency", "General Delinquency" and "Youthful/Stranger aggression".

Moreover, literature to date tends to associate, with consensus, the propensity to recidivate for sexual offenders with two dimensions identified as "Sexual Deviance" and "Antisocial traits" (Doren, 2004, Hanson & Morton-Bourgon, 2007; Hanson & Morton-Bourgon, 2004). Although studying latent dimensions, such as Sexual deviance and Antisociality, is a promising avenue of research (Doren, 2004; Mann, Hanson, & Thornton, 2010), which could contribute to bridge the gap between theoretical and empirical approaches in understanding sexual recidivism, and provide a clearer clinical foundation for recidivism prevention treatments for sex offenders (Craig, Browne, Stringer & Beech, 2005; Doreen, 2004), few studies to date have investigated this issue by empirically extracting latent dimensions. In this regard, with respect to latent dimensions of instruments measuring static factors related to recidivism, empirical studies on this matter consensually suggests the extraction of at least two latent dimensions, which are rigorously equivalent to Antisociality and Sexual Deviance (Allen & Pflugradt, 2014; Barbaree, Langton, Blanchard & Connor, 2009; Barbaree, Langton, & Peacock, 2006b; Pham & Ducro, 2008; Olver,

Wong, Nicholaichuk & Gordon, 2007; Roberts, Doren & Thornton, 2002). Moreover, many of these studies found more than the two dimensions equivalent to Antisociality and Sexual Deviance, such as "treatment responsivity" (Olver & al., 2007), "criminal history" (sexual and non-sexual; Pham & Ducro, 2008); "immaturity" (Craig & al., 2007), "young and single", violent agressions (Knight & Thornton, 2007), "emotional detatchment" (Roberts & al., 2002), "psychopathic sexuality" (Walters, Knight & Thornton, 2007); age (Barbaree & al., 2009) as well as "young and single", "child sexual abuse", "male victims", "persistence" and "detached predatory behavior" (Barbaree & al., 2006). With regards to the Static-99R, the studies of Brouillette-Alarie, Babschishin, Hanson & Helmus (2016; Brouillette-Alarie, Proulx & Hanson, 2018) suggested a three-factor solution, corresponding to the following dimensions: presence of antisocial traits/general delinquency, sexual deviance, and a construct entitled "Youthful stranger aggression"(young age and stranger victims; Brouillette-Alarie & Hanson, 2015). While it was possible to precisely define the Youthful stranger aggression dimension to any precise and psychological meaningful construct or trait (Brouillette-Alarie & Hanson, 2015), few possible explanations were suggested by Brouillette-Alarie and al. (2016), as this dimension could represent a specific lifetime period in sexual offending, as stranger victims could be related to age, or indicate a distinctive propension to sexualized aggression, while its empirical validity needs to be proven (Brouillette-Alarie & al., 2016). Moreover, Brouillette-Alarie and al. 2018 subsequent study on a sample of 613 Canadian sexual offenders showed that a third dimension, other than Sexual criminality and General Criminality could be extracted, labelled Youthful criminality and equivalent the Youthful stranger aggression dimension previously cited. The authors suggested that this dimension could be specifically linked to sexual crimes which included intend to harm, and would be associated with psychological constructs such as sexual sadism or hostility towards women (Brouillette-Alarie & al., 2018).

Tableau 1. –   Table 1. – Litterature review – Dimensions obtained from empirical studies

Reference	Risk assesment	1st Factor	2nd factor	3rd factor	Other Factors
Allen & Pflugradt, 2014	Static-99	Sexual deviancy	General criminality	Young and single	NA
Barbaree & al., 2006	VRAG, MnSOST-R, SORAG, Static-99	Antisocial Behavior	Child sexual abuse	Persistance	Detachted Predatory behavior, Young and SinbSle, Male victims
Brouillette-Alarie & al, 2016	Static-99R, Static-2022R, Stable-2007	Persistance/ Paraphilia	Youthful Stranger agression	General criminality	NA
Brouillette-Alarie & al., 2018	Static-99R	Sexual criminality	General criminality	Youthful stranger agression	NAVR
Craig & al., 2007	Static-99	Sexual Deviance	General criminality	Immaturity	NA
Miner & al., 2022	SOTIPS	Sexual Risk	Antisocial opposition	NA	NA
Olver & al., 2007	VRS-SO	Sexual Devieance	Criminality	Treatment responsivity	NA
Pham & Ducro, 2008	SORAG, Static-99	Criminal history	Antisocial personnality	Victim-offender relation	Sexual offense cateogry
Roberts & al., 2002	PCLR-R, Static-99, MnSOST-R, VRAG	Sexual Deviance	General criminality	NA	NA
Walters & al., 2007	MnSOST-R; Risk-Matrix 2000, Static-99, SORAG, SVR-20	Sexual violence	Psychopathic sexuality	NA	NA

As for dynamic factors, only a few studies have been looking at dimensionality of risk assessments including dynamic assessments, such as Olver and al. (VRS-SO, 2007), or McGrath, Lasher and Cummings (SOTIPS, 2012), where results indicated the extraction of dimensions of Antisociality and Sexual Deviance, as well as treatment responsivity (Olver & al., 2007) and "Criminality" and "Social Stability and support" (McGrath & al., 2012). More so, the study by Miner, Brouillette-Alarie, Davies, Newstrom, Robinson, Thornton & Hanson (2022) investigating the structure of the SOTIPS (McGrath & al., 2012), a recidivism risk assessment tool evaluating dynamic risk factors of sex offenders on probation or parole. To this end, the factor analysis conducted by the authors

resulted in a two-factor solution, which were Sexual Risk and Antisocial Opposition. These results were different from those first found in a factor analysis conducted by McGrath et al., 2012) in which the two factors found were Sexual Deviance, Criminality and Social Stability and Support.

It should be mentioned, however, that McGrath et al. (2012) had conducted factor analysis through Pearson correlation matrix, rather than focusing on polychoric correlations (Miner & al., 2022), which may explain this discrepancy. Results of Miner et al.'s (2022) study were also consistent with the majority of studies investigating dimensions of risk assessment tools according to static factors, showing with consensus at least two factors which were conceptually similar to Antisociality and Sexual Deviance (Brouillette-Alarie et al., 2016; Brouillette-Alarie et al., 2018). They were also similar to the few studies concerning dynamic factors (Olver & al., 2007; McGrath & al., 2012). Hence, results of Miner et al.'s (2022) study were also consistent with Etzler, Eher, and Rettenberger's (2020) study, which, to date, remains the only study that looked specifically at Stable-2007. Eltzler & al. (2020) conducted a study of 638 federally mandated sex offenders assessed by the Federal Evaluation Center for Violent and Sexual Offenders (FECVSO) in Australia from 2001 to 2011. During this study, a sample of 638 sexual offenders were assessed with the Static-99 and Stable-2007, and recidivism data were extracted after 5 years. Results of the predictive validity study of the instruments performed by ROC curve analysis, showed that the Static-99R had AUC values generally equal to or greater than .679 depending on recidivism subtype (Eltzler & al, 2020). The results indicated that Stable-2007 improved the prediction of sexual, violent, and general recidivism, following incremental validity analysis performed via survival curve analysis (Eltzler & al., 2020). In addition, the exploratory factor analysis performed by the authors, through polychoric correlation matrix, allowed the extraction of three factors, identified as Antisociality, Sexual Deviance and Hypersexuality (Eltzler & al., 2020). As

Antisociality and Sexual Deviance were both found as underlying dimensions for static and dynamic factors, empirical studies risk assessment dimensionality would also support the assumption that static and dynamic factors would not be so clear-cut. More research needs to be done in that matter, as the number of studies of risk assessment dimensionality in regard to sexual offending remains tenuous to this day.

In brief, while the Static-99R and Stable-2007 remain the most widely used recidivism risk assessment tools for sex offenders to date, and the study of dimensions appears to be an avenue of research to address the shortcomings of actuarial measures, only a small number of studies examine the dimensionality of these instruments. Furthermore, as noted by Brouillette-Alarie, Hanson, Babschishin & Benbouriche (2014), although there is a consensus on identifying dimensions that are homologous to the concepts of Antisociality and Sexual Deviance, few studies to date seem to proceed with factor analysis methods adapted to the generally dichotomous or ordinal items of the Static-99R and Stable-2007 (Kubinger, 2003). However, research on dimensional structure of the Static-99R and the Stable-2007 could allow for a better empirical understanding of psychological dimensions that could underlie both static and dynamic factors, and thus help to clarify what psychological elements and mechanisms could, at least partially, explain recidivism. Similarly, the identification of these latent, psychological dimensions could better guide treatments to be carried out in order to prevent recidivism among sexual offenders. However, research on this topic is still in its infancy and needs to be solidified by further work.

The current study

A first objective of the current study is to evaluate the predictive validity of the Static-99R and the Stable-2007. First, consistently with the results of the studies produced to date (Allen & Pflugradt, 2014; Barbaree, Langton, Blanchard & Connor, 2009; Barbaree, Langton, & Peacock, 2006; Pham & Ducro, 2008; Olver, Wong, Nicholaichuk & Gordon, 2007; Roberts, Doren & Thornton, 2002), it was expected that this study would produce results with moderate to high indicators for the Static-99R and the combination of the Stable-2007 and the Static-2007, both in terms of total scores for the Static-99R and in terms of risk categories for sexual recidivism. These expectations were not the same for the Stable-2007 alone, as the results of several studies show non-significant results in predicting sexual recidivism (Etzler & al, 2020), and the scoring rules do not recommend its use without the Static-99R (Fernandez & al., 2014) in predicting recidivism. Second, we are interested in assessing the incremental validity of the Stable-2007 when added to the Static-99R. Each of the analysis were performed, on one hand, for the total scores, and on the other hand for the risk categories derived from these total scores, whereas the reporting of results by clinicians by risk categories rather than by total scores is a common practice (Harris, Lowenkamp & Hilton, 2015). It is expected that the Stable-2007 adds incrementally to the predictive validity of the Static-99R.

A second objective is to investigate the dimensionality of the Static-99R and Stable-2007. To this end, exploratory factor analysis was conducted for the Static-99R and Stable-2007 items, respectively. For the Static-99R, it was expected that at least two dimensions corresponding conceptually to dimensions such as Sexual Deviance and Antisociality would be extracted, in accordance with the results present in the literature to date (Allen & Pflugradt, 2014; Barbaree, Langton, Blanchard & Connor, 2009; Barbaree, Langton, & Peacock, 2006b; Hanson & Morton-Bourgon, 2004; Pham & Ducro, 2008; Olver, Wong, Nicholaichuk & Gordon, 2007; Roberts,

Doren & Thornton, 2002). For the Stable-2007, as with the Etzler et al. (2020) study, no specific hypothesis was made, and due to the small amount of previous empirical studies allowing us to anticipate precise results. We would anticipate, with caution, that Antisociality and Sexual Deviance would be at least partially identified, and that latent dimensions from static and dynamic individual factors would be similar.

Methods

Sample

In order to constitute our sample, we collected all archive and active files at the Centre d'Intervention en Délinquance Sexuelle (CIDS) located in Quebec, Canada. The data was collected between 1998 and 2021, which was equivalent to more than 2400 files. The CIDS services include sexological legal expertise, as well as individual and group treatment targeting sexual offending, whether it is judicialized or not, or sexual deviance problematic with or without acting out. Its services are addressed to every gender and are available for adults and teenagers. While extensive programs and other clinical services are regularly offered, the majority of CIDS's clients are not necessarily subject of a formal sex-legal expertise.

Data was collected from the CIDS paper and computer files, allowing for the coding of socio-demographic data, official police and court data, and finally the clinical assessments included in the files. Of these, a total of 797 individual files were retrieved from participants who received a sexology assessment, which included actuarial risk assessments. These assessments were conducted in a context where forensic sexology expertise requests were made by probation officers, lawyers, or the offenders themselves. Sex offenders who were assessed were therefore free to withdraw from the process at any time, and their collaboration to the process was mandatory as the CIDS could accept or refuse to proceed with the expertise. Assessments were most often conducted

Tableau 2. – Table 2 : Descriptive information for the total sample (N = 797)

Variables	M (SD)	% (n/N)
Age	43 (15.12)	(795)
Ethnicity		
Caucasian		67.5% (224/332)
African-american		7.5% (25/332)
Asian		1.5% (5/332)
Arabic/Persian		6.3% (21/332)
Hispanic		7.2% (24/332)
Indigenous		4.4% (17/332)
Other		5.7% (22/332)
Marital Status		
Single		42.5% (291/685)
In a relationship		24.4% (167/685)
Common-law spouse		6% (41/685)
Married		14.5% (99/685)
Separated		4.8% (33/685)
Divorced		6% (41/685)
Widowed		1.9% (13/685)
Mental health issues, self-reported		41.3% (185/448)
Physical health issues, self-reported		21.0% (82/390)
Legal status		
Before sentencing		73.5% (457/622)
Pronounced guilty		15.3% (95/622)
In appeal proceedings		0.8% (5/622)
Non-judiciary client		3.7% (23/622)
Criminal Charges		
Sexual interference (s 151 Cr.C.)*		51.4% (361/703)
Invitation to sexual touching (s 152 Cr.C.)*		26.1% (183/701)
Sexual exploitation of person with disability* (s 153.1 Cr.C.)		6.4% (45/699)
Incest (s 155 Cr.C.)*		2.9% (20/700)
Indecent acts (s 173) (Cr.C.)**		7.7% (54/700)
Exposure (s 173 (2) Cr.C.)		2.7% (19/700)
Sexual assault (s 271 Cr.C.)		41.7% (293/702)
Sexual assault with a weapon, threats to a third party or causing bodily harm (s 272 Cr.C.)		3.1% (22/700)
Aggravated sexual assault (s 273 Cr.C.)		0.3% (2/700)
Other		30.8 % (218/707)

in a presentence setting, under provincial mandate, as shown in Table 1. Sexology and risk evaluations were carried out by the team's clinicians, who were members of a professional order and most often professional sexologists, and who were duly trained to carry out the various risk assessment tools such as the Static-99R and the Stable-2007. As such, data was obtained from usual and routine practices, under conditions that have not been controlled in a research context. However, data on the total score, and scores for each item of these instruments were not systematically available for the entire sample. Age of the sample individuals varied from 17 to 83 years (M= 43,0 years). The socio-demographic data, type of charge, and legal status of the offenders are reported in Table 1. Of the 560 individuals for whom employment information was available, 51.3% were employed on a full-time job (n= 291), 6.5% were employed on a part-time job (n = 37), 8.8% were unemployed (n= 50), 9.7% were retired (n=55), 6.4% were receiving social assistance (n=93), 3% were receiving government's compensation benefits (n= 17) and 4.2% were full time students (n = 24). As sexual offender categorization, such as one distinguishing rapists from child molesters was not specified, and as this distinction could not be based on criminal charges only, as a majority of them were still pending, it was not possible to proceed in such classification. Furthermore, while victim age and relation to offender was available, it would not provide information linking victim information to offense category (such as hands-off or hands-on sexual offense), which would also prevent us from dividing sample into sex offending categories.

For the purposes of the study, we removed from the sample women, sex offenders who had committed only cybercrimes, and participants who were under 17 years of age at the time of the assessment. The scoring manual for the Stable-2007 clearly stated that it is not possible to use the results obtained to assess the risk of recidivism for subjects under 17 years of age, but that it is possible to use the tool with these populations for clinical purposes only (Fernandez & al., 2014),

while Static-99R assessments had only been completed for offenders aged 18 years and older. Of the remaining participants, evaluations were available for 360 individuals for the Static-99R, 368 for the Stable-2007 and 344 files included both of these assessments, as seen in Table 2. It should be noted that we were unable to convert the results of Stable-2000 into Stable-2007 scores since only the results of the conceptual dimensions scores and not the individual items were available, making conversion impossible. The offenders who had been evaluated with the Stable-2000 were removed from the sample as well. Conversion from the Static-99 to the Static-99R was not needed, as every individual evaluated with the Stable-2007 was also evaluated with the Static-99R, beside missing data. The research assistants who coded the chart data remained blind to recidivism data.

Measures

Static-99R

The Static-99R (Helmus & al., 2012) is an actuarial tool measuring the risk of sexual recidivism in adult male sex offenders, through static risk factors. The items correspond to official information such as criminal records, and the scoring rules are also available online, including the validated French version (www.static99.org). The Static-99R consists of 10 items, i.e., 1. Age at release from index sex offense 2. Ever live with a lover (more than 2 years) 3. Index non-sexual violence -any conviction 4. Prior non-sexual violence- any conviction 5. Prior sex offense 6. Four or more sentencing date (excluding index) 7. Any conviction for non-contact sex offenses 8. Any unrelated victims 9. Any Stranger victim and 10. Any male victims. Of these items, eight items are scored from 0 to 1, depending on whether the item is present (1 point) or absent (0 point). The two items rated differently are age, rated from -3 to 1 depending on whether the offender is over 60 years old (-3 points), between 41 and 60 years old (-1 point), between 35 and 40 years old (0 point), or under 35 years old (1 point), and prior sexual offenses, rated from 0 to 3, depending on whether the

Tableau 3. – Table 3: Descriptive statistics for the Static-99R and Stable-2007.

	n	% n	M	SD	Min	Max
Static-99R – Total Score	360		1.76	2.52	0	10
Static 99R – Risk Category	360					
Level I: Low (1 or lower)	177	49.2%				
Level II: Moderate-Low (2,3)	83	23.1%				
Level III: Moderate (4,5)	73	20.3%				
Level IV: High (6+)	27	7.5%				
Stable-2007 – Total Score	368		8.74	4.66	0	21
Stable-2007 – Risk Category	368					
Low	54	14.7%				
Moderate	204	55.4%				
High	110	29.9%				
Static-99 and Stable-2007 combined – Risk Category	344					
Level I: Low (-3,-2)	151	43.9%				
Level II: Moderate-Low (-1.0)	75	21.8%				
Level III: Moderate (1,2,3)	52	15.1%				
Level IVa : Moderate-High (4,5)	40	11.6%				
Level IVb: High (6+)	26	7.6%				

offender has no charges or convictions on their prior record (0 points), 1 to 2 charges and/or 1 conviction (1 point), 3 to 5 charges and/or 2 to 3 convictions (2 points), and more than 6 charges and/or more than 4 convictions (3 points). The total Static-99R score ranges from -3 to 12, and can be converted into risk categories, i.e., low (1 or lower), Moderate-Low (2,3), Moderate-high (4.5) and High (6 and higher), unrelated victims 9. Any Stranger victim and 10. Any male victims. Of these items, eight items are scored from 0 to 1, depending on whether the item is present (1 point)

or absent (0 point). The two items rated differently are age, rated from -3 to 1 depending on whether the offender is over 60 years old (-3 points), between 41 and 60 years old (-1 point), between 5 and 40 years old (0 point), or under 35 years old (1 point), and prior sexual offenses, rated from 0 to 3, depending on whether the offender has no charges or convictions on his or her prior record (0 points), 1 to 2 charges and/or 1 conviction (1 point), 3 to 5 charges and/or 2 to 3 convictions (2 points), and more than 6 charges and/or more than 4 convictions (3 points). The total Static-99R score ranges from -3 to 12, and can be converted into risk categories, i.e., low (1 or lower), Moderate-Low (2,3), Moderate-high (4.5) and High (6 and higher). Note that the last version of the scoring rules recommended converting total scores into five risk categories rather than four, namely, very low, below average, average, above average, and well above average (Phenix & al., 2016), but that the conversion into four categories was still in use in the assessments conducted with our sample.

Stable-2007

The Stable-2007 (Hanson & al. 2007; Fernandez & al. 2014) consists of 13 dynamic risk factors which are declined in 13 dichotomic items: 1.Significant social influences, 2. Capacity for relationship stability, 3. Emotional Identification with Children, 4. Hostility towards women, 5. General Social Rejection/Loneliness, 6. Lack of Concern of Others, 7. Impulsive acts, 8. Poor cognitive Problem Solving, 9. Negative Emotionality/Hostility, 10. Sex Drive/Preoccupation, 11. Sex as Coping, 12. Deviant sexual interests, and 13. Cooperation with supervision. The Stable-2007 is derived from revisions of the SONAR (Hanson & Harris, 2001) and the Stable-2000 (Hanson & al., 2001), which were empirically developed by collecting items through quantitative literature review, interviews, and items in existing assessment tools. Results of the same authors' Dynamic Supervision project, a review of the Stable-2000 that examined predictive validity via a

prospective design, helped to produce a revised version of this tool that excluded the dimension of "attitudinal support for sexual offending," which was not a strong predictor of sexual recidivism (Hanson & al., 2007). This revised version corresponds to the Stable-2007 (Hanson & al., 2007). It should be noted that the scoring rules for this tool require that the Stable-2007 be paired with a tool assessing static factors of sexual recidivism (Hanson & al., 2007; Pheni & al., 2007). The Stable-2007 total score can be associated with one of three risk categories: low, moderate or high. according to the Stable-2007 scoring rules (Phenix & al., 2007), it is possible to combine the risk category obtained from Stable-2007 (low, moderate, high) with the risk category obtained from Static-99R (low, medium-low, medium-high, high / low, low-moderate, moderate, moderate-high, high). When the Stable-2007 risk level is moderate, the Static-99R score remains unchanged; when the Stable-2007 risk level is low, the combined Static-99R and Stable-2007 score corresponds to a lower risk level than Static-99R. When the risk category of Stable-2007 is high, the combined risk level of Static-99R and Stable-2007 corresponds to that of Static-99R plus one category. Note that the categories resulting from the addition of the Stable-2007 and Static-99R scores can be added to the ACUTE-2007 categories, measuring imminent risk rather than guiding treatment planning (Babschishin and Hanson, 2020).

Recidivism

Recidivism data were collected via the Sûreté du Québec data from 1998 through 2021. Recidivism was defined as any new charge following the most recent charge at the time of the assessment. We divided recidivism into three categories: general recidivism (any form of recidivism), sexual recidivism (any crime of a sexual nature, with or without contact), and non-sexual violent recidivism (any violent crime in addition to crimes of a sexual nature). The research assistant

collecting and coding recidivism variables was blinded to risk assessment variables as well as any other information collected. Descriptive statistics for recidivism are presented in Table 3.

Statistical analysis

Receiver Operation Characteristic

The predictive validity of the Static-99R and Stable-2007 was performed by Receiver Operation Characteristic (ROC) curve analysis and interpretation of areas under the curve (AUC; Helmus & Babchishin, 2017). The AUC parameters indicate the probabilities that a higher score is related to higher risk and not to chance, and thus represent the probabilities that, for a randomly selected recidivist and non-recidivist individual in the sample, the odds are greater for the recidivist to score higher on the risk assessment of a given tool than the non-recidivist. We used criteria proposed by Rice and Harris (2005) to evaluate the results, according to which AUC values under .639 would indicate a medium effect size and AUC values higher than .714 would indicate a large effect size. These analyses were performed using SPSS.

Cox Regression Analysis

The predictive validity of the Stable-2007 was investigated by survival analyses using hierarchical Cox regression analysis, which evaluates the hazard ratio for one or more predictor variables, such as risk factors or items, for the outcome (i.e., recidivism) associated with them, for unequal follow-up periods (Flores, Holsigner, Lowenkamp & Cohen, 2017). We chose this method in part because of the unequal follow-up time of the participants in the sample. The first step was to enter the total scores and risk categories from the Stable-99R, and then in the second step, those from the Stable-2007. Subsequently, the incremental validity of Stable-2007 was assessed based on whether the chi-square change was significant or not. These analyses were also performed using SPSS.

Exploratory Factor analysis

To identify the dimensions latent to the risk factors identified by the Stable-2007 and the Static-99R items, an exploratory factor analysis was performed for each instrument, following the method

used by Etzler et al. (2020) and according to the method recommended by Brouillette-Alarie et al (2016). The extraction of the factors was thus carried out by polychoric correlations with the MPlus software (Muthén, B., & Muthén, 2017). This method was chosen since the ordinal or predominantly dichotomous nature of the items of the Static-99R and the Stable-2007 could have limited the range artifacts if analyses were to be carried by Pearson correlations such as in a factorial analysis performed with SPSS (Kubinger, 2003). Furthermore, factors were extracted by the Weighted Least Square Means and Variance adjusted method WLSM method (Muthén, B., & Muthén, 2017) and then adjusted by the Geomin rotation method since correlations between items were expected for each instrument. Partially replicating the factor selection criteria of Brouillette-alarie et al. (2016), the criteria for selecting the number of factors were as follows, in order to select the best model: a) Kaiser criterion (Eigen values greater than 1; Kaiser, 1960) b) parallel analysis (Horn, 1965) c) model fit, as only models showing significant chi-square values ($p < 0.05$) were retained. as it would not be recommended to interpret models for which the chi-square values were not significant (Muthén & Muthén, 2010). Subsequently, three criteria were used to determine the models with the best fit: a) the rood mean square error of approximation (RMSEA), which assesses the quality of the model in comparison to a model showing a perfect factor structure (Tabachnik & Fidell, 2007), and for which a value greater than .06 indicates a good factorial solution; b) the comparative fit index (CFI), which evaluates the factorial structure by comparing it to a baseline model where, on the contrary, there is no link between the items, and whose value must be higher than . 95 to indicate a good factorial solution (Hu & Bentler, 1999); and c) the Tucker-Lewis index, which evaluates the fitness of the model by taking into account all the parameters included in the factorial analysis (Tucker & Lewis, 1973), and whose value equal to or greater than .95 indicates a good factorial solution (Hu & Bentler, 1999). Finally, for the retention of items by factors for the selected models, we used the criteria of Comrey and Lee (1992), suggesting that loadings higher than of .71 (50% overlapping variance) are considered excellent, .63 (40% overlapping variance) very good, .55 (30% overlapping variance) good, .45 (20% overlapping variance) fair, and .32 (10% overlapping variance). As with the loadings above .40 recommended by Stevens (1992) and selected by Brouillette-Alarie et al. (2016), we selected items with correlations above .32, prioritizing their significance over the magnitude of the correlations because the small number of individuals in the sample reduced the statistical power of the analysis.

Results

Descriptive Statistics

Recidivism information was available for 590 individuals. Among these, general recidivism rate was 43.6% (n = 257). The minimum number of days for general recidivism was 4 days, and the maximum was 8687 days, or 23.8 years (M=2590 days). Specifically for sexual recidivism and violent (non-sexual) recidivism, the recidivism rates were 12% (n= 71) for sexual recidivism and 14.1% (n= 112) violent (non-sexual) recidivism, respectively. Time until recidivism was committed and detected after assessment did not exceed 3475 days for sexual recidivism and 3398 days for violent (non-sexual) recidivism. Recidivism data was not retraceable for every file where a forensic evaluation was conducted, and as a certain propensity of CIDS clients, for which recidivism data was obtained, were not subject of a risk assessment. Of the total sample, recidivism data and results from the Static-99R and Stable-2007 risk assessments was available for a total of 262 individuals. From this sample, recidivism rate was 41.6% (n = 109) for general recidivism, 8.78% (n = 23) for sexual recidivism, and 15.6% (n = 41) for violent (non-sexual) recidivism. Descriptive statistics for the Static-99R and Stable-2007 are presented in Tables 2 and 3. As presented in Table 4, the correlation between Static-99R and Stable-2007 overall risk levels and Static-99R risk categories alone was high ($r = .904$; $p < .01$), but moderate for the risk levels derived from Stable-2007 ($r = .696$, $p < .01$). The correlation between risk levels from Stable-2007 and Static-99R was weaker ($r=.423$, $p < 0.01$).

Tableau 4. – Table 4

Descriptive statistics for the Static-99R and Stable-2007.

	n	M	SD	Min	Max	Correlations			
						Static-99R Total score	Static-99R Risk Level	Stable-2007 Total score	Stable-2007 Risk Level
Static-99R Total score	344	1.76	2.52	-3	10	-			
Static-99R Risk Level	344	1.86	2.14	1	5	.932**	-		
Stable-2007 Total score	344	8.74	4.66	0	21	.498**	.471**	-	
Stable-2007 Risk Level	344	2.14	0.65	1	3	.446**	.423**	.890**	-
Static-99 and Stable-2007 Overall Risk Level	344	2.17	1.31	1	5	.857**	.904**	.701**	.696**

$**p < 0.0$

Predictive validity

The results of the predictive validity analyses of the Static-99R and Stable-2007 are presented in Table 4. The AUC values for the Static-99R, both total scores and risk categories, were significantly high for each type of recurrence, ranging from .652 to .717. For the Stable-2007, the total scores were lower than the Static-99R for each recurrence type, with AUC values ranging from .608 to 709 for each recurrence type. In addition, the Stable-2007 risk categories showed non-significant results in predicting sexual recidivism. Finally, when combining the risk levels/categories specifically from Stable-2009R and Stable-2007 according to the rules of the Stable-2007 scoring manual (Hanson et al., 2015), the results showed significant and high values for all three types of recidivism, with AUC values ranging from .614 to .695.

Tableau 5. –   Table 5

Predictive validity of the Static-99R Scores, and Stable 2007 scores, and Static-99R Risk Level, Stable-2007 Risk Level and Combined Static99-R and Static-2007 Risk Levels for General, Sexual and Violent Recidivism (n=262).

	(nR /N)	Static-99R		Stable-2007		Static-99R and Stable-2007 Combined (Overall Risk Level)	
		AUC	95% CI	AUC	95% CI	AUC	95% CI
Total Score							
General recidivism	(109/262)	.670*	[.605, .736]	.620*	[.552, .691]	-	-
Sexual recidivism	(23/262)	.680**	[.553, .806]	.650*	[.539, .761]	-	-
Violent (non-sexual) recidivism	(41/262)	.717**	[.638, .795]	.709**	[.612, .807]	-	-
Risk Level							
General recidivism	(109/262)	.652**	[.584, .721]	.608**	[.538, .679]	.655**	[.586, .723]
Sexual recidivism	(23/262)	.674**	[.549, .800]	.614	[.497, .732]	.695**	[.578, .811]
Violent (non-sexual) recidivism	(41/262)	.685**	[.591, .779]	.692**	[.595, .790]	.709**	[.614, .804]

Note. The sample size varies according to missing data .AUC= Area under the curve; CI = confidence interval; nR = number of recidivists. **$p < 0.01$ *$p < 0.05$

Incremental validity

The results of the analyses assessing the incremental validity of the model in which Static-99R and

Stable-2007 are included in the same model are presented in Table 5. More specifically, the second

step of survival analyses via Cox hierarchical regression are presented for both total scores and risk categories for each instrument.

The Stable-2007 total scores and the Stable-2007 risk categories did not showed significant predictive validity for sexual recidivism or for general recidivism, as HR values were not significant for these. However, chi-square change values were significant for general, violent and sexual recidivism with the addition of Stable-2007 to Static-99R, as well as for Stable-2007 total scores or risk categories.

Exploratory factor analysis

We performed an exploratory factor analysis for the 10 items of the Static-99R for those assessments where not only total scores but all individual items, were available (n= 339). We selected two significant patterns under the four previously named analysis parameters and then proceeded to the Geomin oblique rotation. According to the three criteria mentioned, including the extracted Eigenvalues and the significance of the chi-square values for the extracted models, two solutions were found to be significant, showing respectively two and three dimensions, with respective Eigenvalues of 3.174 and 1.408. The 2-dimensions model had an RMSEA value that was poor (RMSEA = .121; 90% confidence interval = .103-.140) and CFI .902 and TLI values of .830. For this reason, this model was not retained. The Standardized Root Mean Square Residual (SRMSR) was also greater than .08 (.139). The 3-dimensions model showed an adequate RMSEA value (.068; 90% confidence interval = .044-.903), a CLI value of .978 and a TLI value of .946. The SRMSR value was also acceptable (.081). The loadings for this model are presented in Table 6. Only one item was only weakly correlated with one factor ('any male victim', r =- .285), and only one item was correlated with more than one factor, item 2 (Ever lived with a lover for 2 years or more). The first dimension consisted of two items: 1. Age at release from index sex offense and

item 2. Ever lived with a lover. The second dimension consisted of five items: 3. Index non-sexual violence - any conviction, 4. Prior nonsexual violence - any conviction, 5. Prior sex offenses, 6. Four or more sentencing dates excluding index), and 7. Any conviction for non-contact sex offenses. The third factor extracted included items 2. Ever lived with a lover, 7.Any conviction for non-contact sex offenses, 8. Any related victims and 9. Any stranger victim. It should be noted that the correlation of two items (Item 1, factor 1; Item 8, factor 3) showed correlations slightly higher than 1.0, but that the authors of the Mplus software indicated that, in such a case, these could be kept and that the analysis of the solution could be continued (Muthén & Muthén, 2017). The results for this model are presented in table 6.

We then conducted predictive validity analyses of these dimensions using AUC analyses of ROC curves. All three factors extracted by the factor analysis significantly predicted general recidivism, and only the first factor predicted violent (nonsexual) recidivism. None of the factors predicted sexual recidivism. The AUC values and ICs are presented in Table 9.

We also conducted an exploratory factor analysis of the 13 Stable-2007 items for assessments where item ratings were available (n = 327). Based on the three criteria mentioned, we first selected the 2 and 3 factor solutions, including the extracted Eigenvalues and the significance of the chi-square values for the extracted models, two factor solutions were found to be significant, showing 2 and 3 factors respectively, showing Eigenvalues of 2.276 and 1.056 respectively. The 2-factor model had an RMSEA value that was good (RMSEA = .044; 90% confidence interval = .027-.061) and CIF (.971) and TLI (958) values showing a good factorial solution. The SRMR value was equal to .060. However, the 3-factor model had an RMSEA value that was good and higher than the 2-factor model (RMSEA = .035; 90% confidence interval = .007-.055) and CIF (.986) and TLI (.974) values showing good factorial solution. The SRMR value was equal to .044. Thus, we retained the

3-factor model. Only one item was sufficiently correlated to one factor (item 2, Capacity for Relationship Stability). Only one item was correlated with more than one factor, which was item 7.Implusive act. The first extracted factor included the following items: 1. Significant social influences 4. Hostility towards woman 5. General social rejection/Loneliness 6. Lack of Concern for other, 7. Impulsive Acts 8. Poor Cognitive Problem Solving and 9. Negative Emotionality/Hostility and 13. Cooperation with supervision. The second factor corresponds to items 3. Emotional identification with children, 10. Sex Drive/Preoccupation, 11. Sex as Coping and 12. Deviant sexual interests. The third factor corresponded to item 7: Impulsive acts, which was already underpinned by the first factor, and which showed a weaker correlation with factor 3. We therefore decided to exclude it to prevent multicollinearity of the factors found and considering that this factor would not have been retained according to Stevens' (2012) item retention criteria. The results for this model are presented in table 7.

We conducted ROC curve analysis to evaluate the predictive validity; AUC values revealed that the first factor significantly predicted general and violent (non-sexual) recidivism, but the second factor did not predict any type of recidivism. The AUC values and ICs are presented in Table 9.

Tableau 6. – **Table** 6

Incremental validity of the Static-99R Scores, and Stable 2007 scores, and Static-99R Risk Level, Stable-2007 Risk Level and Combined Static99-R and Static-2007 Risk Categories for General, Sexual and Violent Recidivism.

	Static-99R					Stable-2007				Change (Stable 2007)	
	Valid percent (*nR /NR*)	*b*	*P*	HR	95% CI	*b*	*p*	HR	95% CI	χ^2	*P*
Total Score											
General recidivism	(109/262)	.183	< .001	1.201	[1.106, 1.303]	.032	.165	1.033	[.987, 1.081]	**31.647**	< .001
Sexual recidivism	(23/262)	.192	.027	1.212	[1.022, 1.437]	0.053	.289	1.055	[.956, 1.164]	**10.557**	.005
Violent (non-sexual) recidivism	(41/262)	.227	.001	1.254	[1.094, 1.439]	.090	.018	1.094	[1.016, 1.178]	**30.454**	< .001
Risk Level											
General recidivism	(109/262)	.459	< .001	1.583	[1.298, 1.930]	.247	.127	1.280	[.932, 1.759]	**30.462**	< .001
Sexual recidivism	(23/262)	.599	.007	1.820	[1.182, 2.805]	.252	.496	1.286	[.624, 2.653]	**11.334**	.003
Violent (non-sexual) recidivism	(41/262)	.464	.004	1.591	[1.156, 2.188]	.801	.008	2.228	[1.231, 4.034]	**25.595**	< .001

Note. The sample size varies according to missing data. AUC= Area under the curve; CI = confidence interval; nR = number of recidivists; NR = total number of recidivists in any category.

Discussion

The first objective of the present study was to assess the predictive validity of the Static-99R, the Stable-2007 and their combined scores, as well as the Stable-2007 incremental validity. The results of the AUC values following ROC-Curve analysis showed that Static-99R and Stable-2007 total scores showed significant indicators of predictive validity, as did the risk categories for both instruments, except for of the Stable-2007 risk levels that would not significantly predict sexual recidivism. While predictive validity for the Stable-2007 was suggested by numerous studies (Brankley & al, 2021; Hanson & al., 2015) results were consistent with some previous studies

(Eltzer & al, 2020), and as Stable-2007's coding rules clearly states that this instrument should always be paired with a static risk assessment in order to viably predict recidivism, this result was not expected but not surprising either (Brouillette-Alarie & al, 2016; Eltzer & al., 2020; Fernandez & al, 2014). Regarding the incremental validity of Stable-2007, the chi-square values extracted from Cox regression analyses showed that the total scores and risk categories of Stable-2007 increased the predictive validity of Static-99R compared with Static-99R used alone, which was consistent with Etzler & al study (2020). In brief, our results, provided by a field study in a setting where the evaluators' assessment practices were not controlled, supported the use of Stable-2007 and the beyond Static-99R to predict sexual, violent non-sexual and general recidivism among sexual offenders, and more precisely in a francophone setting.

Tableau 7. –   Table 8

Rotated Factor Loadings of Exploratory Factor Analysis after Rotation – Static-99R

	Young and Single	Persistence (sexual and non-sexual)	Detatched Predatory Behavior
1.Age at release from index sex offense (S991)	**1.063***	.165	-.002
2. Ever lived with a lover (S992)	**.603***	-.009	**.425***
3. Index non-sexual violence – any conviction (S993)	.294*	**.431***	.029
4. Prior non-sexual violence – any conviction (S994)	.161	**.951***	-.014
5. Prior sex offense (S995)	-.107	**.454***	.300*
6. Four or more sentencing dates (excluding index) S996)	.010	**.927***	.150
7. Any conviction for non-contact sex offenses (S997)	.034	**-.450***	**.556***
8. Any unrelated victims (S998)	-.143	.015	**1.027***
9. Any stranger victims (S999)	-.001	-.066	**.835***
10. Any male victims (S9910)	-.035	-.285*	.214

*p <0.05

Tableau 8. –   Table 8

Rotated Factor Loadings of Exploratory Factor Analysis after Rotation – Stable 2007

	1	2	3
1.Significant Social influences (S2007_1)	**.511***	.054	.062
2. Capacity for Relationship Stability(S2007_2)	.318*	.196*	.264*
3. Emotional Identification with Children (S2007_3)	-.002	**.674***	-.422
4. Hostility Towards Women (S2007_4)	**.649***	.239*	-.143
5. General Social Rejection/Loneliness (S2007_5)	**.443***	.299*	-.024
6. Lack of Concern of Others (S2007_6)	**.786***	.219*	.022
7. Impulsive Acts (S2007_7)	**.504***	-.025	**.369***
8. Poor Cognitive Problem Solving (S2007_8)	**.693***	.229*	.002
9. Negative Emotionality/Hostility (S2007_9)	**.740***	-.012	.278*
10. Sex Drive/Preoccupation (S2007_10)	.014	**.746***	.399
11. Sex as Coping (S2007_11)	-.082	**.760***	.244
12. Deviant Sexual Interests (S2007_12)	.087	**.529***	-.052
13. Cooperation with Supervision (S2007_13)	**.599***	-.267*	.008

*p <0.05

The second objective of the current study was to study the presence of dimensions respectively underlying risk factors measured by the items of the Static-99R and the Stable-2007. In order to evaluate the latent dimensions of Static-99-R, we performed an exploratory factor analysis via polychoric correlations, favored for dichotomous and ordinal items, according to a parallel analysis and the factorial model selection criteria prescribed by the VLMSV method (Muthén & Muthén). The factorial solution chosen was a 3-factor model. The first factor, comprising two items, was entitled Young and Single. The second factor, combining factors assessing history of violence, prior convictions, sex crimes, and lack of history of non-contact sex offenses, was labeled Persistence (sexual and non-sexual). Finally, the third factor combining lack of cohabitation, as well as choice of unrelated and or unknown victims and non-contact sexual offense history, was titled Detached Predatory Behaviour, as it included similar risk factors to those of a dimension named in the same way the dimensionality study conducted by Barbaree & al. (2006). These results differ from most studies examining the dimensionality of risk assessment instrument measuring static risk factors, specifically those evaluating the dimensionality of the Static-99R, which firstly identify Antisociality and Sexual deviance as the primary factors related to recidivism among sexual offenders (Allen & Pflugradt, 2014; Barbaree, Langton, Blanchard & Connor, 2009; Barbaree, Langton, & Peacock, 2006; Brouillette-Alarie & Hanson, 2015; Brouillette-Alarie & al., 2016; Brouillette-Alarie & al., 2018; Pham & Ducro, 2008; Olver, Wong, Nicholaichuk & Gordon, 2007; Roberts, Doren & Thornton, 2002). However, the three dimensions extracted for the Static-99R items were similar to three of the six dimensions identified by Barbaree et al. (2006) in a study where Principal Component Analyses were conducted form the RRASORR, the Static-99, the VRAG, the SORAG, and the MnSOST-R in a sample of 311 sex offenders. The authors idendified a fist dimension labelled as "Young and Single", and explained that age at release from index and not having cohabited with a romantic partner could speak to age at assessment, which is intuitively

related to the two items comprising this dimension (Bararee et al., 2006). To that effect, the current literature indicates that increasing age is related to decreasing recidivism for sex offenders (Rettenberger, Haubner-Maclean & Eher, 2013). With respect to the other two factors found in the present study, Persistence (sexual and non-sexual) was somewhat similar to the Persistence dimension identified by Barbaree and al. (2006), combining the following items: " criminal history of violent (including sexual) crimes, number of previous sex convictions, prior sex offenses, sex offenses when supervised, and the use of force or threat to achieve compliance of the victim" (Barbaree et al, 2006). Our Persistence (sexual and non-sexual) factor was also consistent with the criminal history dimension found by the factor analysis carried out by Pham & Ducro (2008) on the Static-99 and SORAG items. Finally, the third factor found in our study was also similar to The "Detatch Predatory Behaviour" detailed by Barbaree and al. (2006), where this dimension was described by the following: "any stranger victim, victim a stranger in any sex offense, sex offense committed in a public place, any unrelated victim, any conviction for noncontact sex offenses". Hence, Barbaree & al. (2006) considered Persistance and Detached Predatory Behaviour to be aspects, or sub-dimensions, of Sexual Deviance. In the current study, Detatch predatory behavior included never having cohabited with a partner, having a history of noncontact offenses and having unrelated victims, was also conceptually consistent with Sexual Deviance (Doreen, 2004). While the Detatch predatory behavior items were similar to those include in Brouillette-Alarie and al. (2016) Youthful Stranger aggression, it could not be clearly associated with this one as it did not include any item related to age. Regarding the Persistence (sexual and non-sexual) dimension identified by the present study, dimension included prior convictions, non-sexual violence, but was negatively correlated with non-contact sexual offense history. As it included non-sexual violence, but also contact sexual history, it was not possible to conceptualize this dimension as a subdimension of Sexual criminality or General criminality as Barbaree and al. (2006). While this

factor might indicate the frequency of prior offenses, which is an general predictor of recidivism, frequency, and recidivism, tends to be low among sexual offenders and their relationship to the occurrence of sexual recidivism remains to be elucidated (Alex R. Piquero, David P. Farrington , Wesley G. Jennings , Brie Diamond & Jessica Craig). In sum, while the three dimensions (Young and Single, Detached Predatory behavior and Persistance (sexual and non sexual)) found from Static-99R items where conceptually coherent with sexual or general recidivism, and empirically consistent with Barbaree and al. (2006) results, it was not possible to conceptually or empirically associate these dimensions with broader ones such as Sexual criminality, General criminality or Brouillette-Alarie and al. (2016) Youthful stranger aggression dimension.

Following factor analysis, we conducted predictive validity analyses along each of the three dimensions found. In contrast to Barbaree et al.'s (2006) results, the Young and Single dimension did not predict sexual recidivism, but only violent and general recidivism. Note that the Barbaree et al. (2006) did not consider general recidivism. Similarly, the second dimension found, Persistence (sexual and nonsexual), predicted general recidivism only, whereas Barbaree et al.(2006) results indicated that their Persistence dimension predicted violent recidivism only. Finally, the Detached Predatory Behavior factor predicted neither sexual recidivism nor violent recidivism, whereas our study indicated that this dimension could predict general recidivism. In sum, these results were not what was expected, as none of the dimensions found for the Static-99R predicted sexual recidivism. While it could be suggested that these dimensions would not predict sexual deviance as they could not be clearly conceptualized as an aspect or subdimension of sexual deviance, as previously cited, the main explanation seems to lie in the fact that the baseline recidivism was very low for general (n = 108), violent (n=40), and sexual (n=24) recidivism, and

Tableau 9. –   Table 9

Predictive validity of the three Static-99R factors: *Antisociality and Sexual deviance according to recidivism type*

	Young and single		Persistent sexual and non-sexual offending		Detatched Predatory Behavior	
(nR /N)	AUC	95% CI	AUC	95% CI	AUC	95% CI
General recidivism (108/266)	.669*	[.605-.734]	.565*	[.493-.637]	.573*	[.501-.644]
Sexual recidivism (24/266)	.609	[.495-.793]	.606	[.486-.726]	.669	[.540-.798]
Violent (non-sexual) recidivism (23/266)	.647*	[.565-.729]	.684	[.582-.786]	.589	[.489-.688]

*$p < 0.05$

Tableau 10. – Table 10

Predictive validity of the two Stable-2007 factors: *Antisociality and Sexual deviance according to recidivism type*

	Antisociality		Sexual deviance	
(nR /N)	AUC	95% CI	AUC	95% CI
General recidivism (99/234)	.648*	[.575, .721]	.475	[.400, .551]
Sexual recidivism (24/234)	.714*	[.609, .819]	.484	[.376, .593]
Violent (non-sexual) recidivism (37/234)	.642	[.609, .819]	.593	[.376, .593]

that these results should be interpreted with caution, as the possible inferences are limited by the statistical power of the analyses.

We performed an exploratory factor analysis on Stable-2007 items using the same criteria and parameters as for the analyses studying the dimensionality of Static-99R. A 3-factor solution was retained. The first factor retained was practically identical to the factor Antisociality found by Elzer & al. (2020). The second factor extracted included the two items defining Sexual Deviance as extracted by Elzer & al. (2020), and furthermore included two more items related to sexual deviance, which were Sex-Drive and Sex as Coping (Feelgood, Cortoni & Thompson, 2005). Finally, the third factor extracted by our analysis comprised only one factor, impulsive acts, which was also more strongly correlated with factor 1. We therefore excluded this third factor. Hence, the factorial solution retained for Stable-2007 in our study was a two-factor solution, which were entitled Antisociality and Sexual Deviance. These results were nearly identical to Etzler et al.'s (2020) study investigating the dimensionality of the Stable-2007, but also similar with other studies of assessment tools assessing dynamic factors for sexual offenders (Brouillette-Alarie & Hanson, 2015; McGrath et al., 2012; Miner et al., 2022; Olver et al., 2017), although most of these found more than two dimensions, such as Youthful stranger aggression (Brouillette-Alarie & al., 2016; Brouillette-Alarie & al., 2018). These results are also consistent with studies investigating the dimensionality of static factor risk assessment instruments among sexual offenders (Brouillette-Alarie & al., 2014). Thus, the results of the present study add to the findings of previous studies suggesting that dimensions of antisociality and sexual deviance are present for both static and dynamic factor instruments. Although further research is required to provide firm conclusions, this consistent finding supports the assumption according to which boundaries between static and dynamic factors may be more permeable than initially conceptualized (Beech & Ward, 2004;

Brouillette-Alarie & al., 2018). Although Hanson et al. (2014) suggest that dimensions combining both dynamic and static risk factors do not change the unchangeable nature of static factors, they may help to indicate the presence of latent dimensions that may shed light on issues related to risk that may be subject to change, and conceptually clarify the mechanisms leading to recidivism (Brouillette-Alarie & al., 2014; Mann & al., 2010). However, if the results of our study the Stable-2007 dimensionality suggests similarities between static and dynamic risk factors regarding recidivism among sexual offender populations, as they may share Antisociality and Sexual Deviance latent dimensions compared to previous studies, An exception reside in our own study, as the Static-99-R factor analysis we conducted showed 3 factors, namely 1. Young and Single 2. Persistence (non-sexual and sexual) 3. Detachted Predatory behavior that were not precisely equivalent to Antisociality or Sexual Deviance, nor Youthfull and Stranger aggression.

In a second step, we studied the predictive validity of the dimensions of the Stable-2007 and proceeded to analyses of AUC values of ROC curves. While the first factor, Antisociality, predicted violent and general recidivism, Sexual Deviance predicted none. These results differ from those of Etzler et al. (2020) who found that each of the factors significantly predicted all 3 types of recidivism, and that Sexual Deviance was more predictive of sexual recidivism than Antisociality. Although these results may suggest that Antisociality may be more predictive of sexual recidivism than the literature suggests to date (Brouillette-Alarie & al, 2018), the baseline recidivism was very low for general (n = 99), violent (n=37), and sexual (n=24) recidivism, so these results should also be interpreted with caution, as possible explanations for these results are limited by the critically low recidivism rates in our sample.

Limitations of the current study

Although the results of the present study include useful or interesting results at last, there are some limitations that must be considered. First, data obtained in our sample did not allow for the refinement of analysis by different categories of sex offenders. Thus, the current literature tends to distinguish between child molesters and rapists, both from a clinical and theoretical and clinical point of view (Hanson, Helmus et Harris, 2015), and it is also suggested that they could show different sexual recidivism baselines (Bartosh, Garby, Lewis & Gray, 2003; Hanson, Helmus & Harris, 2015; Harris, Knight, Smallbone & Dennison. 2011; Harris, Mazerolle & Knight, 2009; Parent, Guay & Knight, 2012). Further research considering these distinctions would therefore be relevant, especially to understand how latent dimensions underlying single risk factors could manifest themselves differently depending on sexual offenders subgroups (Etzler & al., 2020). Another main limitation was the sample size, where baselines for recidivism, especially sexual recidivism were critically low. Furthermore, this study was conducted in a so-called field setting where practices of the clinicians assessing and scoring of the Static-99R and Stable-2007 were not controlled. This aspect could be considered as an asset in better understanding assessment in a realistic setting, but it was not possible to study inter-judge reliability of these two instruments, which could not therefore be included in the analyses of the reliability of the instruments. Additionally, it should be noted that the majority of the assessments conducted were done in a pre-sentencing context, which is not representative of all sexual offenders (Jackson & Hess, 2007). Additionally, bias could occur for the evaluators as when the results of the assessment may have consequences for the person being assessed (Helmus & al., 2021), as risk assessments are part of the information considered in imposing a sentence. As previously mentioned, results presented by this study are limited to an adult male sex offender population. While the removal of female and

juvenile participants and perpetrators of cybercrime sex offenses was consistent with the Static-99R and Stable-2007 scoring rules, it should be remembered that sex offending as a phenomenon can include females (Cortoni & Gannon, 2013), juvenile offenders (Letourneau & Miner, 2005), and cybercrime offenders (Briggs, Simon & Simonsen, 2011; Gallo, 2020). Thus, although risk prediction literature targeting sex offenders has nearly doubled over the past decade, limitations of this study echo the literature to date, as risk assessment for recidivism among these populations remains sparse. Furthermore, because the CIDS is also an institution where many treatments and programs are offered, it remains possible that treatments were offered after risk assessments made by clinicians, which was likely to affect recidivism rates downward (). Finally, due to the limited number of studies examining the dimensionality of the Static-99R and Stable-2007, further research is needed to empirically explain, infirm or support the results of the present study with larger and more diverse samples.

Conclusion

Appropriate risk management of sex offenders requires ensuring the predictive validity of the instruments used. To this end, the results of our study indicated that the Static-99R predicted general, sexual, and violent (non-sexual) recidivism among sex offenders, and that the Stable-2007 incrementally predicted all three types of recidivism. These results applied to both the total scores and the risk categories of these two instruments. Furthermore, the dimensionality of the instruments may allow for a better understanding of how recidivism occurs with sex offenders, and to guide treatment more accurately. Our results showed that the dimensions of sexual deviance and antisociality could be extracted from the Stable, consistent with similar research. For the Static-99R, three dimensions were identified: Young and Single/Persistence(sexual and nonsexual)/Detatched Predatory Behaviour. Regarding dynamic risk factors, two dimensions were

extracted from Stable-2007, which were Antisociality and Sexual deviance. However, none of these could significantly predict sexual recidivism. Further research is needed, especially on larger sample sizes, and considering distinctions between different types of sex offenders as latent dimensions could indicate specific aspects of sexual offending and therefore differ among sexual offending typologies.

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