The Structured Interview of Family Assessment Risk: Convergent Validity, Inter-rater Reliability and Structural Relations

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Abstract The quality of parenting, composition and socio-economic status are family risk or protective factors on juvenile delinquency, however, there is not an instrument to help psychologists and social workers to specifically assess the adolescent offender’s family. This study set out to accomplish an additional validation study of the structured interview of family assessment risk (SIFAR), a structured professional judgment tool for the assessment of family risk and protective factors of juvenile delinquents. The statistical analyses included inter-rater reliability, convergent validity with YLS/CMI, the Partial Least Squares approach to structural equation modeling and receiving operator characteristics (ROC) analysis. A sample of 130 male adolescent delinquents detained in Portuguese forensic facilities and their parents, were paired analyzed. The YLS/CMI was used to analyze the convergent validity with SIFAR. SIFAR shows a strong correlation with the YLS/CMI family context, moderate to high values of inter-rater reliability; SIFAR factors show that they are predictive determinants of the Moderate Four risk factors. ROC analysis shows adequate accuracy power. The findings show that SIFAR it is useful as an additional assessment tool for structured risk assessment instruments since it allows understanding the vulnerabilities and strengths of the delinquent’s family.

Keywords Delinquency • Family assessment • Parenthood • Risk assessment

Introduction

The literature on forensic youth assessment and intervention highlight that the functioning of the family (e.g. parenting, family bonds, family attachment, parental supervision, parent and sibling criminality, family conflicts) and the family social conditions (poverty, neighborhood, social net) are either a risk factor or a protective factor, depending on its quality (Goodman & Adler, 2010; Jones, 2008; McGuire, 2004; Piquero & Moffitt, 2010; Welsh & Farrington, 2010). The interaction between these familial, contextual and individual variables it is complex and must be analyzed not as cumulative factors but in a comprehensive approach (Andrews & Bonta, 2010; Case & Haines, 2009; Farrington, 2004).

To achieve this comprehensive approach, fundamental concepts have been clarified. The evolution of risk and protective concepts has led to the development of models like the risk-need-responsivity model (RNR; Andrews & Bonta, 2010), which empirically demonstrated to be an useful integrative method of assessment and intervention planning (Andrews & Bonta, 2010; Heilbrun et al., 2010; Loeber, Farrington, Stouthamer-Loeber, & White, 2008). Based on the risk, needs and responsivity principles, this model is anchored beyond the diagnosis of criminogenic risk and strength factors by intending to deliver clinical and social services to criminal individuals to the decrease reoffending (Andrews & Bonta, 2010; Hoge, 2010).

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On risk assessment the matter relating to protective factors is currently worthy of special attention, as the one given to the risk factors. Empirical studies have shown that the interplay between risk and strengths/protective factors present a significant relevance in risk assessment (Farrington, Loeber, Jolliffe & Pardini, 2008; Lodewijks, de Ruiter & Doreleijers, 2010), being considered that the omission of the protective factors may introduce biases in the case management, like a negative-centered view of clients, negativism in the professionals handling the case and lengthy detention of offenders (de Vogel, Robbé, de Ruiter, & Bouman, 2011).

In regard to the protective factors, Farrington et al. (2008), de Ruiter and Nicholls (2011) and de Vogel et al. (2011) share the conceptualization of the moderation effects of protective factors, on contrary to the buffer model like Andrews and Bonta (2010) purpose in their RNR model. Farrington et al. (2008) differentiate protective factors (buffer factors) from promotive factors, being the latter conceptualized as the factors associated with less likelihood of later delinquency, whether they decrease recidivism (remedial promotive factors) or prevent adolescents’ criminal involvement (promotive preventive factors), which moderate differently the effect of risk factors across ages.

The conceptual evolution of criminal risk assessment started with prediction of dangerousness based in clinical or unstructured professional judgment, considered the first risk assessment stage (Andrews & Bonta, 2010; Constanzo & Krauss, 2012; Fulero & Wirghtsman, 2009), which led to several mistakes in risk assessment (false positives and false negatives). Because of this gaps, the second generation of risk assessment instruments emerged based in an actuarial form, that is, focusing in static/historical factors, which investigation demonstrated that where more acute than clinical based decisions in the prediction of re-offending (Andrews & Bonta, 2010; Constanzo & Krauss, 2012; Fulero & Wirghtsman, 2009). But the risk prediction was not enough and the forensic field asked for intervention oriented instruments, emerging the third generation of risk assessment, where static and the dynamic risk factors were analyzed to establish the risk prediction (Andrews & Bonta, 2010; Constanzo & Krauss, 2012). The actual fourth generation instruments are based on static, dynamic, risk management and protective factors and is focused on case management. Its approach is integrative to allow the formulation of different risk levels, based on the principles of risk, criminogenic needs, the assessment of special responsivity factors and personal strengths, the case can be followed up throughout the intervention process (Andrews & Bonta, 2010; Heilbrun et al., 2010; McGuire, 2004).

Currently there are two major categories of risk assessment instrument design: (a) the actuarial, which include a score for a group of risk factors to assess the probability of future violence or recidivism; and (b) the structured professional judgment (SPJ) tools, based in checklists of risk and protective factors in an integrative framework for a risk level assessment of a particular person in their specific conditions (de Vogel et al., 2011; Robbé, de Vogel, & Spa, 2011).

The official Portuguese juvenile forensic services use the YLS/CMI (Hoge, Andrews, & Leschied, 2002), a fourth-generation risk assessment tool based on actuarial assumptions, which establishes a quantitative estimate for general and violent offending. The YLS/CMI also assesses protective factors such as responsivity factors that might facilitate the intervention (Hoge, 2010).

Despite the relevant contribution of this instrument in forensic practice in youth risk assessment, its dichotomous coding strategy (present/absent) does not assess the particular family conditions or strategies to deal with relational and contextual difficulties which have impact in the adolescents’ offending risk. The YLS/CMI organizes family information as a collection of difficulties and strengths, but does not define to what extent the family organizes itself to face these problems and does not cover the strategies they use, or do not use, to solve the family difficulties found. This is very important in clinical forensic practice especially if we intend to intervene directly in adolescent risk factors and case management, due to the role of parenting and family factors in the probability of criminal involvement in juveniles, showing the sensitivity of this development period to family conditions (Andrews & Bonta, 2010; Jones, 2008; Loeber et al., 2008; Wasserman et al., 2004).

Given the relevance of family to juvenile offending risk and the lack of multidimensional family assessment, the structured interview of family assessment risk (SIFAR) has been developed (Santos & Alberto, 2015). Therefore, this study presents a second level of statistical analysis in the SIFAR validation, using the original sample, this time aiming to analyze the convergent validity with YLS/CMI, the Receiving Operator Characteristics analysis (ROC) and inter-rater reliability based on Intra-class Correlation Coefficient (ICC). We hypothesize that SIFAR family assessment is related to risk assessment of the family context YLS/CMI item and its risk level, with the two tools having different but supplementary predictive results about juvenile criminal conduct.

Methods

Sample

This study uses the original convenience sample of parents and their young male offenders detained in adolescent
justice facilities (Santos & Alberto, 2015), of the Directorate-General of Rehabilitation and Imprisonment Services of the Portuguese Ministry of Justice. Of a total of eight juvenile justice facilities in Portugal, five authorized the collection of data. The selection criteria for participation in the study were: (a) male participants between the ages of 12–18; (b) they had to be serving sentences of more than 1 year; (c) both the juvenile and his parents had to be interviewed and had to give their permission; (d) the adolescents had to be within the first 6 months of conviction; (e) the parent(s) selected must have been the cohabitating parent(s) since the child was 8 years old; (f) in respect by the voluntary participation, the parent(s) define who participate in the assessment interview (which one or both parents).

No female sample was included because of their residual presence in the detention system at date (N = 28). The male adolescents sample comprised of 130 incarcerated male offenders, which is 60 % of all juvenile delinquents detained in Portuguese forensic facilities (N = 215) at date. They were between 13 and 18 years old at the time of assessment (M = 16.06; mode = 17; SD = 1.07; range = 13–18); 72.30 % had previous mixed addictions of alcohol and drugs; 56.90 % had 4 years of school failure and only 5.40 % had failed two school years or fewer. In terms of offences, 49.2 % had committed theft, robbery and assault, 17.70 % robbery, 13.10 % assault, 6.90 % theft; 6.20 % had committed multiple crimes including rape; 2.30 % had committed homicide or attempted homicide, and 1.50 % had committed multiple crimes including homicide.

The adults sample comprised of 130 parents/guardians of whom 77.70 % were females (n = 101), 90 % parents and the rest guardians (referred to from this point as parents). Most of the parents were between 31 and 55 years old (80 %). The youngest parent was 26 and the oldest was aged over 60. In terms of family structure, 48.50 % were intact families (n = 63), 40.80 % single parents (n = 53) and 10.80 % (n = 14) are reconstituted families. With regard of their origin, 70 % of parents were born in Portugal, 23.80 % were immigrants from Portuguese-speaking African countries and 6.20 % were Romani.

Procedures

All the information collected with SIFAR was confirmed with social security, forensic records and interviews with case managers, being the parents and the adolescents informed about this procedure and signed an informed consent prior to their inclusion in this study. The data was collected through individual interviews after the family weekend visiting time, in a discrete and private area in each detention facility. The interviewers were forensic psychologists with experience in risk assessment with YLS/CMI and SIFAR. These professionals were submitted to 1 day training course (in a total of 08 h) about adolescent offender’s family assessment with SIFAR.

Instruments

SIFAR (Santos & Alberto, 2015) was designed to be an SPJ tool for family risk assessment of adolescent offenders aged between 13 and 18. It should be analyzed by forensic psychologists or social workers with family assessment/ intervention experience and should be combined with an adolescent structured risk assessment tool such as the YLS/CMI.

SIFAR it is based on an interview with a parent’s and adolescent’s versions of thirteen family’s areas: physical health, mental health, substance abuse, education, employment, housing/transport, legal problems, violence, social/ethnic dissonance, poverty, social net, social security and parenting. From this interview the risk items (education, employment, house/transport, legal problems, social/ethnic dissonance, poverty, social net, social security and parenting) and the protective items (high discipline, low parental stress, low physical punishment, high family involvement) are assessed and coded as dynamic factors (Santos & Alberto, 2015). Because of their clinical relevance in families and adolescence, we considered physical health, mental health, substance abuse, violence, supervision, living in pro-social neighborhood, non-adolescent mother and good relation with pro-social peers as management factors. The statistical analysis about reliability of SIFAR with this sample showed an internal consistency of .75 for the risk items, namely, education, poverty, legal problems, social net, parenting, employment, housing/transport, social security and social/ethnic dissonance, and .79 for the protective factors—high discipline, low parental stress, low physical punishment, high family involvement (Santos & Alberto, 2015). The Corrected Item-Total Correlation for both risk and protective factors indicated acceptable strength between item ratings and total scores, and the Mean Inter-Item Correlations showed unidimensionality (Nunnaly & Bernstein, 1994) of SIFAR (Santos & Alberto, 2015). An Exploratory Factor Analysis was processed over the correlation matrix of the risk items (Santos & Alberto, 2015). Two factors emerged, the social-economic factor, with education, employment, housing/transport, poverty and social/ethnic dissonance, social security items and the social conformity factor that encompassed legal problems, social net and parenting. Both factors accounted for 48.15 % of total variance. The reliability score of the social conformity factor it is unacceptable (.47), fact why SIFAR must be considered as a unified structure once the reliability of these factors is in question when taken separately.
The *Workspace* constitutes de registration form of the family assessment, and it allows the recording of that data providing a place where all the information can be integrated and analyzed, enabling the design of family interventions (Santos & Alberto, 2015).

The YLS/CMI (Hoge et al., 2002) risk/needs assessment factors are divided into proximal factors (history of conduct disorder, antisocial attitudes, values and beliefs, dysfunctional parenting, dysfunctional behavior and personality traits, poor school/vocational achievement, antisocial peer associations and poor use of leisure) and distal factors (indirect but having relevant influence on the proximal factors: criminal/psychiatric problems in family of origin, family financial problems, poor accommodation and negative neighborhood environments), factors which present the highest association with juvenile criminal conduct (Hoge, 2010). In the YLS/CMI, the family context is assessed as a dynamic factor through six items: parental supervision, difficulties in behavior control, discipline, inconsistent parental practices and negative relationship with mother and/or father. The family protective factors are related with stable and cohesive family, parent support and care, support and care from other adults, adolescent attached to mother or other adult positive model, adequate parent supervision, adequate family economic status, adequate and attractive family relational environment (Hoge, 2010).

**Statistical Analysis**

As referred, a previous set of descriptive and factorial analysis with this sample was made (Santos & Alberto, 2015). The actual study it is a further step in the validation of SIFAR with the same sample, based in the inter-rater reliability, convergent validity, ROC analysis and the Partial Least Squares approach to Structural Equation Modeling (SEM), the PLS Path Modeling (PLS-PM; Lohmöller, 1989; Wold, 1982, 1985). A prospective study of this sample with SIFAR was not allowed by the forensic services because of an existing official study about re-offending. Fact why the results of YLS/CMI were used to the validation. The risk items with lowest inter-rater reliability are education, employment dissonance, social network, social security and parenting. The risk items with lowest inter-rater reliability are

The inter-rater reliability analysis was based on 26 random cases from the original sample assessed by three independent forensic psychologists. It was assessed with the ICC using the two-way random effect variance model and the violation of multivariate normality (Bagozzi & Yi, 1994; Diamantopoulos, Riefler, & Roth, 2008; Henseler et al., 2009). Our study uses a large complex model involving many indicators and latent variables. All constructs are formative models because the indicators of both risk assessment tools form their dimensions/parameters (defined as latent constructs in our model). Additionally it was intended to understand the relation between the dimensions of the two tools and with the risk level measure of the YLS/CMI. The assessment of the measurement model was based on the nomological validity, external validity by the variance of the error, the significance of weights and the multicollinearity by the variance inflation factor (VIF; Diamantopoulos et al., 2008; Henseler et al., 2009). The structural model was assessed by the $R^2$ of endogenous variables (.67—substantial; .33—moderate; .19—weak; Henseler et al., 2009) the sign, magnitude and significance of the estimated values for path coefficients, the effect size (.02—weak, .15—medium and .35—large; Cohen, 1988), and finally the prediction relevance with the blindfolding procedure (Diamantopoulos et al., 2008; Henseler et al., 2009).

The nonparametric bootstrap procedure (Efron & Tibshirani, 1993) was used to create 130 bootstrap samples to provide the statistical significance of all parameter estimates, i.e. weights and path coefficients.

The predictive power was estimated by the ROC analysis using the criteria of Hosmer and Lemershow (2000) for interpretation of the area under curve (AUC). The ROC analysis used an 95% confidence interval (CI) based in a logistic regression model, using the predicted probability of SIFAR total value for the YLS/CMI family context (recoded as low family risk—coded 0; moderate to high family risk—coded 1) and YLS/CMI total value (recoded as low risk—coded 0; moderate to very high risk—coded 1), using SPSS 17.0.

**Results**

The inter-rater reliability analysis was based on 26 random cases from the original sample assessed by three independent forensic psychologists. It was assessed with the ICC using the two-way random effect variance model and consistency type.

There are excellent intra-class correlation coefficients for single measures of the risk items education, employment, dissonance, social network, social security and parenting. The risk items with lowest inter-rater reliability are

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poverty, with moderate ratings (.50–.74, p < .001), legal problems, from moderate (.55, p < .001) to excellent (.76, p < .001), and housing/transport, with an ICC coefficient from .54 (moderate, p < .001) to .89 (excellent, p < .001). Regarding SIFAR total risk scores, the ICC coefficient gives an excellent score for the three coders (over .90, p < .001).

With respect to protective factors, high family involvement, high discipline and low physical punishment have good to excellent ICC coefficient ratings (from .62 to .84, p < .001), and low parental stress has scores from moderate to excellent (.42–.78, p < .001). The ICC coefficient for total scores of protective factors present moderate (.64, p < .001) to excellent (.82, p < .001) reliability scores (Table 1).

The YLS/CMI tool was chosen to establish the convergent validity because it is the official risk assessment tool of the Portuguese juvenile forensic services, and all practitioners are well versed in its design and concepts.

The convergent validity between SIFAR and YLS/CMI was based on the Pearson r correlation, looking for the association between YLS/CMI family context and SIFAR items; also, SIFAR total measure was used only for this research purpose (Table 2).

The SIFAR risk items legal problems and poverty both have a small positive correlation with YLS/CMI family context (r = .20, p < .01), and SIFAR parenting item has a large positive correlation with YLS/CMI family context (r = .61, p < .01). All the SIFAR items have a low positive correlation with YLS/CMI peer relations, education/employment, attitudes/orientation and overall risk level. Of these, we draw attention to the moderate association between SIFAR education and YLS/CMI education/employment (r = .33, p < .01), peer relations (r = .42, p < .01) and global risk level (r = .35, p < .01).

Regarding the overall values, SIFAR total value has moderate correlation with the YLS/CMI previous criminal behavior (r = .30, p < .01), family context (r = .40, p < .01), peer relations (r = .49, p < .01), substance abuse (r = .30, p < .01), leisure (r = .34, p < .01), attitudes/orientation (r = .35, p < .01) and overall risk value (r = .46, p < .01; Table 2).

With respect to protective factors, SIFAR protective items have a small to moderate negative correlation with YLS/CMI risk items education/employment (from r = −.19 until r = −.34, p < .01), peer relations (from r = −.19 up to r = −.34, p < .01) and overall risk level (from r = −.16 up to r = −.30, p < .01). Relative to the association of SIFAR protective items with YLS/CMI family context item, no association was found between them.

The PLS-PM (Ringle et al., 2005) was used to analyze the relation between the SIFAR and YLS/CMI risk factors and its predictive capability with the risk level, which is why the formative measures were used. The measurement model was assessed by an item purification process (Diamantopoulos et al., 2008; Henseler et al., 2009) based on indicators that capture the meaning of a formatively-measured construct using expert opinion, validating the formative indicators as relevant and in agreement with theoretical rationale of risk and family assessment (Diamantopoulos et al., 2008; Henseler et al., 2009).

In the assessment of formative models, Diamantopoulos et al. (2008) and Henseler et al. (2009) argue that internal consistency and construct validity are not meaningful since the formative model is based on the assumption of error-free measurement. Since reliability is not meaningful, the validity assessment at the construct and indicator level is fundamental (Henseler et al., 2009). To confirm if the formative index presented the intended meaning of the construct, the external validity was calculated by Henseler et al. (2009), which should be compared with the threshold of .80, considered the minimum value for external validity (Henseler et al., 2009). Table 3 presents the external validity scores of the constructs. The second order constructs SIFAR total and YLSRiskLevel show adequate external validity, explaining respectively 88 % of the variance of the SIFAR adolescent family risk and 99 % the YLS/CMI adolescent risk level.

At the indicator level, the validity is assessed by the level of significance for the weights of the formative indicators and the presence of multicollinearity

Table 1 Inter-rater reliability by intra-class correlation coefficient (n = 26)

| SIFAR risk items               | Rater A  | Rater B  | Rater C  | Rater A  | Rater C  |
|--------------------------------|----------|----------|----------|----------|----------|
| Education                      | .89      | .88      | .94      |          |          |
| Employment                     | .91      | .92      | .93      |          |          |
| Housing/transport              | .89      | .61      | .54      |          |          |
| Legal problems                 | .76      | .64      | .55      |          |          |
| Dissonance                     | .91      | .87      | .98      |          |          |
| Poverty                        | .57      | .74      | .50      |          |          |
| Social net                     | .94      | .93      | .95      |          |          |
| Social security                | .95      | .95      | .95      |          |          |
| Parenting                      | .77      | .75      | .77      |          |          |
| Global scores                  | .91      | .94      | .91      |          |          |
| SIFAR protective               |          |          |          |          |          |
| Family involvement             | .72      | .69      | .81      |          |          |
| High discipline                | .81      | .81      | .62      |          |          |
| Physical punishment            | .84      | .64      | .78      |          |          |
| Low parental stress            | .65      | .78      | .42      |          |          |
| Global scores                  | .79      | .82      | .64      |          |          |
violence = 3.29; social/ethnic dissonance

External validity (Diamantopoulos et al., 2008; Henseler et al., 2009). A bootstrapping procedure was run (Efron & Tibshirani, 1993) to determine the significance of the weights. Table 4 presents the weights and their standard error and t-statistics. All weights are significant at the 5% level, therefore all formative indicators are adequate for the formative indexes.

The multicollinearity diagnosis used a multiple linear regression model with YLS/CMI risk level as dependent variable. The VIF values of all variables (SIFAR risk: poverty = 1.33; social security = 1.45; employment = 1.28; housing/transport: 1.23; substance abuse: 3.29; social/ethnic dissonance = 1.06; legal problems = 2.87; mental health = 2.91; parenting = 1.31; violence = 2.11; social net = 1.24; SIFAR total = 2.05; SIFAR protective: discipline = 3.50; low physical punishment = 1.89; low parental stress = 2.70; non-adolescent mother = 2.36; supervision = 2.28; protective total = 8.78; YLS/CMI: previous criminal behavior = 2.14; family context = 1.47; education/employment = 2.79; peer relations = 3.05; substance abuse = 2.08; leisure = 2.20; personality/behavior = 3.22; attitudes/orientation = 3.01) are less than the threshold of 10, which indicates that multicollinearity among the formative indicators is not an issue (Henseler et al., 2009).

Clarifying the first and second order constructs, the SIFAR parenting covers the parenting practices, the SIFAR protective comprises the total value of protective factors, SIFAR total refers to the total value of SIFAR risk factors, SIFAR social included the family social conditions and substance abuse, YLS/CMI big four refers to the high predictive items of YLS/CMI. YLS/CMI moderate relates to the moderate predictive items of YLS/CMI and finally, the YLS construct refers to the total risk value of YLS/CMI.

Figure 1 shows the standardized estimates of weights, path coefficients and coefficient of determination ($R^2$) of the endogenous variables. The $R^2$ with substantial values are SIFAR parenting ($R^2 = .43$), SIFAR protective ($R^2 = .65$), SIFAR total ($R^2 = .88$), YLS/CMI big four ($R^2 = .69$) and YLS/CMI risk level ($R^2 = .99$), meaning that the proportion of variance of each construct is well explained by its antecedent constructs in the model.

### Table 2 Correlation matrix between SIFAR and YLS/CMI (Pearson r, 2-tailed, n = 130)

| SIFAR     | YLS/CMI | PCB | FC | EE | PR | SA | L  | PB | AO | ORL |
|-----------|---------|-----|----|----|----|----|----|----|----|-----|
| **Education** |         | .22* | .07 | .33** | .42** | .21* | .25* | .22* | .29** | .35** |
| **Employment** |        | .20* | .18* | .23** | .26** | .11 | .19* | .07 | .21** | .26** |
| **House/transp.** |      | .04 | .10 | .06 | .17* | -.03 | .11 | -.04 | .07 | .07 |
| **Legal problems** |    | .10 | .20** | .19* | .23** | .01 | .14 | .14 | .15 | .22* |
| **Dissonance** |      | .12 | .13 | .14 | .26** | -.02 | .14 | .07 | .17 | .18* |
| **Poverty** |         | .20* | .20* | .18* | .29** | .16 | .09 | .09 | .22* | .25** |
| **Social net** |        | .10 | .11 | .02 | .13 | .12 | .17 | .09 | .21* | .16 |
| **Social security** |      | .11 | .13 | .19* | .27** | .17 | .26** | .07 | .08 | .22* |
| **Parenting** |        | .18* | .61** | .13 | .17 | .09 | .00 | .13 | .21* | .25** |
| **SIFAR total** |      | .30** | .40** | .28** | .49** | .30** | .34** | .22* | .35** | .46** |
| **Family involv.** |      | -.13 | -.06 | -.19* | -.26** | -.10 | .00 | -.03 | -.11 | -.16 |
| **Discipline** |        | -.06 | -.04 | -.20* | -.26** | -.13 | -.01 | -.05 | -.09 | -.15 |
| **Punishment** |      | -.19* | .01 | -.21* | -.38** | -.21* | -.20* | -.11 | -.23** | -.27** |
| **Parental stress** |    | -.20* | .04 | -.34** | -.40** | -.26** | -.22* | -.08 | -.23** | -.30** |
| **Protective total** |    | -.13 | -.03 | -.22* | -.37** | -.19* | -.15 | -.03 | -.15 | -.22** |

* Correlation is significant at the .05 level (2-tailed); ** Correlation is significant at the .01 level (2-tailed)
Regarding the path coefficients’ estimates, all relationships are significant (Table 5). The path coefficients show that the SIFAR protective factors have a positive sign in SIFAR parenting latent variable and the risk items have a negative sign, meaning that the protective and risk family indicators have an inverse relation. This shows the expected relations between the corresponding protective factors (the positive sign indicators of the index) and risk factors (the negative sign index indicators); thus, these latent variables have an inverse relation according to the nomological net of risk and protective factors research (Andrews & Bonta, 2010; de Ruiter and Nicholls, 2011; de Vogel et al., 2011; Farrington et al., 2008; Lodewijks et al., 2010).

There are positive values for the path coefficients between SIFAR social and SIFAR total, and between YLS moderate and YLS big four as expected. The magnitude of the path relationships is adequate, with the smallest value being .11 (between SIFAR total and YLS big four) and the highest .80 (between SIFAR parenting and SIFAR protective).

The effect size ($f^2$) analyzes the predictor impact of a latent variable in another latent construct. The effect sizes of the predictor latent variables are shown in Table 6. All the latent constructs of YLS/CMI have large effect sizes on the YLS/CMI risk level. Concerning the SIFAR variables, SIFAR social has a large effect size on SIFAR parenting and SIFAR total, SIFAR parenting has a large effect size on SIFAR protective and SIFAR total, while only SIFAR protective has a weak effect size on SIFAR total. Relative to the relation between the two tools, SIFAR total has a weak effect size on YLS big four and a moderate effect size on YLS moderate, to which family context belongs.

The prediction relevance of the model is based on Stone-Geisser’s $Q^2$, measured by the blindfolding procedure (Henseler et al., 2009). It provides a prediction of the endogenous latent variables’ indicators based on fitting and cross-validation. Its values should be above 0, meaning that the explanatory variables provide predictive relevance to the endogenous constructs (Diamantopoulos et al., 2008; Henseler et al., 2009). As we can see in Table 7, all the latent variables in the model have $Q^2 \geq 0$, thus predicting the endogenous latent variables’ indicators.

The predictive validity calculated by the ROC analysis show that SIFAR total value present an exceptional accuracy power and predictive validity for the family risk level measured by YLS/CMI ($AUC = .93$; 95 % CI .88–.98) and an acceptable accuracy and predictive validity for the YLS/CMI total values ($AUC = .77$; 95 % CI .69–.86).

### Discussion and Applications to Practice

SIFAR is an SPJ tool designed to assess the family risk and protective factors of adolescent offenders and the SIFAR coding is based on the assessment of a family’s coping strategies for the difficulties they are confronted with. SIFAR parenting and education items have the highest average scores in the risk items, reflecting the areas where families found it hardest to devise appropriate strategies to deal with problems, which seems to agree with family investigation in the forensic field (Jones, 2008; Loeber et al., 2008; Wasserman et al., 2004). The large positive correlation between SIFAR parenting and YLS/CMI family context, the positive low to moderate correlation between SIFAR risk items and YLS/CMI global risk value, just as between the SIFAR total and YLS/CMI items, let us conclude with the concurrent validity between the two risk tools. However, the absence of a negative correlation between the SIFAR protective and YLS/CMI family context was unexpected. Nevertheless, the SIFAR protective

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### Table 4 Standardized estimates of weights and its corresponding standard error and t-statistic

| Outer model    | Weight | SE  | T-statistic |
|----------------|--------|-----|-------------|
| YLSBigFour     |        |     |             |
| Attitudes      | .34    | .06 | 5.90        |
| Behavior       | .34    | .06 | 5.30        |
| Peer relations | .40    | .05 | 8.30        |
| PreviousCrime  | .17    | .05 | 3.89        |
| YLSModerate    |        |     |             |
| Education      | .54    | .06 | 9.74        |
| Family context | .24    | .05 | 5.13        |
| Leisure        | .26    | .06 | 4.57        |
| Substance abuse| .31    | .06 | 5.30        |
| YLSSocial      |        |     |             |
| Dissonance     | .24    | .07 | 3.39        |
| Employment     | .28    | .07 | 3.77        |
| Housing        | .14    | .07 | 1.95        |
| Poverty        | .32    | .06 | 5.57        |
| SocialSecurity | .32    | .06 | 5.51        |
| Substance abuse| .34    | .05 | 6.95        |
| SIFARParenting |        |     |             |
| Discipline     | .31    | .08 | 4.10        |
| Legal problems | -.16   | .08 | 2.07        |
| Low punishment | .12    | .06 | 2.10        |
| Low stress     | .29    | .08 | 3.54        |
| Mental health  | -.17   | .07 | 2.61        |
| Non-adolescent | .41    | .10 | 4.28        |
| Parenting      | -.16   | .06 | 2.83        |
| Social network | -.24   | .07 | 3.31        |
| Supervision    | .27    | .07 | 3.94        |
| Violence       | -.24   | .08 | 2.91        |
factors item has a negative correlation with YLS/CMI education/employment, peer relations and overall risk level, reflecting the negative association between the SIFAR assessment of non-abusive or non-neglectful parenting and those adolescent risk factors measured by YLS/CMI. These associations are relevant, which shows the discriminant validity between SIFAR protective and YLS/CMI risk items.

The large association between SIFAR parenting and YLS/CMI family context reflects the major finding about convergent validity. This shows that families with difficulties in implementing adequate strategies to deal with their relations have serious problems in the family context items of YLS/CMI (parental supervision, difficulties in behavior control, discipline, inconsistent parental practices, and negative relationship with mother and/or father).

Assessing SIFAR family strategies lets us consider what is beyond the presence/absence of family risk, and in the YLS/CMI we assess the result of the sum of the presence of a group of indicators, which means that the items in the two

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**Fig. 1** Path diagram of the SEM model (standardized estimated coefficients)

**Table 5** Standardized path coefficient estimates and its corresponding standard errors and t-statistics

| Structural relationship                  | Path coefficient estimate | Standard error | t-statistic |
|-----------------------------------------|----------------------------|----------------|-------------|
| YLSBigFour → YLS                        | .60                        | .02            | 32.06       |
| YLS Moderate → YLS                      | .45                        | .02            | 23.20       |
| YLS Moderate → YLSBigFour               | .78                        | .03            | 22.42       |
| SIFAR Parenting → SIFAR Protective      | .80                        | .13            | 4.41        |
| SIFAR Parenting → SIFAR Total           | -.58                       | .13            | 5.32        |
| SIFAR Protective → SIFAR Total          | .45                        | .08            | 5.32        |
| SIFAR Total → YLS Moderate              | .43                        | .07            | 5.75        |
| SIFAR Social → SIFAR Parenting          | -.66                       | .14            | 4.86        |
| SIFAR Social → SIFAR Total              | .71                        | .05            | 14.01       |
| SIFAR Total → YLS BigFour               | .11                        | .05            | 2.06        |
Table 6  Effect sizes ($f^2$) of predictor latent variables

| Latent variable | $f^2$  | Effects |
|-----------------|--------|---------|
| SIFARSocial → SIFARParenting | .76 | Large |
| SIFARSocial → SIFARTotal | 2.68 | Large |
| SIFARParenting → SIFARProtective | 1.82 | Large |
| SIFARParenting → SIFARTotal | .64 | Large |
| SIFARProtective → SIFARTotal | .05 | Weak |
| SIFARTotal → YLSModerate | .23 | Moderate |
| SIFARTotal → YLSBigFour | .10 | Weak |
| YLSModerate → YLSBigFour | 1.51 | Large |
| YLSModerate → YLS | .61 | Large |
| YLSBigFour → YLS | 1.02 | Large |

Table 7  Prediction relevance based on construct cross-validated redundancy

| SSO     | SSE      | $Q^2$ 1-SSE/SSO |
|---------|----------|-----------------|
| YLSModerate | 520.00  | 470.27 | .10 |
| YLSBigFour   | 520.00  | 313.02 | .39 |
| YLS       | 130.00  | 1.87  | .99 |
| SIFARprotective | 130.00  | 46.04 | .65 |
| SIFARParenting | 1300.00 | 1220.89 | .06 |
| SIFARTotal | 130.00  | 27.05 | .79 |

The SIFAR results for protective factors presented in the current study showed that the highest average value is in the high discipline and the lowest one is low parental stress, indicating the opposite frequency of presence of these protective factors. Regarding the convergent validity of the SIFAR protective factors with the YLS/CMI risk factors, there is a significant negative correlation with YLS/CMI peer relations and education/employment, as expected, but no negative correlation with YLS/CMI family context and personality/behavior. Only SIFAR low parental punishment and low parental stress have significant a negative correlation with all YLS/CMI risk factors except family context and personality/behavior). All SIFAR protective factors have a low to moderate negative correlation with the YLS/CMI total risk value. In fact, the single shared antagonistic relation between risk and protective factors is family discipline (assessed as protective in SIFAR and risk in YLS/CMI); no other SIFAR protective factor from the tool coding assesses the same YLS/CMI items, which further testifies to the complementarity of the tools in family risk assessment items.

The inter-rater reliability with ICC for the three independent coders showed good agreement scores for the raters. The use of ICC between coders is important for the reliability studies, in particular when the analysis of risk is based on multiple information sources. This coding strategy is no different from other risk tools such as YLS/CMI and the results for ICC coefficients makes it possible to assume that the SIFAR outcomes are not governed by chance.

The structural model which emerges from PLS-PM was used to model the complex multivariable relationships between the observed and latent variables (Diamantopoulos et al., 2008; Henseler et al., 2009) of both SIFAR and YLS/CMI, to show how the SIFAR items constitute determinants of the risk assessment measured by YLS/CMI. Other variables of SIFAR risk assessment were initially in the model (physical health, education, family involvement) but these two variables were dropped in the purification process. The structural model shows that greater family difficulties in coping with adverse social conditions like employment difficulties, housing/transportation problems, poverty, social security assessment/support and social/ethnic dissonance, seem to be determinants of parenting difficulties in finding adequate strategies to deal with their adolescent sons ($\beta = -.66$; $f^2 = .76$). These results show that the families with greater social difficulties have greater parenting difficulties; these parents, in particular, have more difficulties in finding adequate strategies to deal with parenting, mental health needs, family violence, social network difficulties and legal problems, and fewer parenting protective factors (i.e., less discipline, more physical punishment, greater parental stress, having a non-adolescent mother and less parent supervision). These parenting difficulties are determinants of the SIFAR protective factors total score ($\beta = .80$; $f^2 = 1.82$; total scores were only used for research purposes). The latent variable parenting relates inversely to the protective total scores, which seems to agree with the risk and protective factors assessment (Andrews & Bonta, 2010; de Ruiter and Nicholls, 2011; de Vogel et al., 2011; Farrington et al., 2008; Lodewijks et al., 2010). All the variables that constitute the SIFAR tool are related to its overall score (SIFAR social $\beta = .71$, $f^2 = 2.68$; SIFAR parenting $\beta = -.58$, $f^2 = .64$; SIFAR protective $\beta = .45$, $f^2 = .05$), meaning that the risk and protective factors of SIFAR are determinants of its total score, with different effect sizes and the expected signs, with SIFAR social being the latent construct with highest effect.

With respect to the relation between the tools, the SIFAR total construct is a determinant of the YLS/CMI
moderate construct (where family context is a formative indicator) explaining about 18% of its variance ($R^2 = .18$). The relations between these variables shows that SIFAR protective factors are negative determinants and SIFAR risk factors are positive determinants of YLS/CMI moderate range. The weak effect of the SIFAR total ($\beta = .11, f^2 = .10$) on the YLS big four construct and the large effect of the YLS moderate ($\beta = .78, f^2 = 1.51$) shows that the YLS moderate construct is a major determinant of the YLS big four, explaining almost all the 69% of its variance; the YLS/CMI moderate and big four factors both explain about 99% of its risk level (YLS big four $\beta = .60, f^2 = 1.02$; YLS moderate $\beta = .45, f^2 = .61$). These results show that the SIFAR total has a low level of determination of the YLS/CMI big four, but a high level of determination of the YLS moderate range, where the family context and other individual indicators are present; this seems to contribute to the convergent validity between the tools with respect to family and social conditions.

The exceptional value of predictive validity of SIFAR total value show that the combination of all family risk factors assessed by this tool produce a global value which are accurate relatively to the results obtained by the YLS/CMI family context item.

SIFAR results demonstrated that it is a SPJ accurate toll in the prediction of adolescent offender’s family risk. Being a SPJ tool, SIFAR does not aim to establish a cut off risk value like actuarial tools do, but finding the family contextual factors that contribute to the risk in adolescent criminal behavior. As expected, SIFAR shows that it is a stronger determinant of the YLS moderate four (where family context factor is included) than in YLS big four (historic, individual characteristics and peers relations).

The SIFAR behaved as predicted. It is a family assessment tool to be used in addition to structured risk assessment tools like the YLS/CMI, since it helps to explain both the presence or absence of family conditions and the family strategies for dealing with a number of difficulties which constitute risk conditions for youngsters (Jones, 2008; Loeber et al., 2008; Wasserman et al., 2004). The major differences between SIFAR and YLS are based on the fact that SIFAR is focused on the assessment of several family circumstances that are found in a large proportion of the families of adolescent offenders (Farrington, 2004; Jones, 2008; Loeber et al., 2008; Wasserman et al., 2004), the interrelation between these family areas and parent/family difficulties (Pakman, 2007) and the recursiveness between these difficulties and the strategies that families find to solve them (Madsen, 2007; Pakman, 2007). These findings suggest that family contextual variables are relevant to establishing the prognosis of future involvement in anti-social conduct by child and adolescents (Andrews & Bonta, 2010; Case & Haines, 2009; Farrington, 2004; Loeber et al., 2008). So, the current study present implications in the psychologists and social workers practices, once SIFAR allows the professionals to identify the family life problems/difficulties and strengths, the interaction between these conditions and how it configures a risk to the adolescent’s family, providing clues to the intervention needed. Another relevant issue about SIFAR use it is the fact that it activates the parents of young offenders to work in partnership with the professionals, validating their understandings about themselves and their problems. Validate and not disqualify, helps professionals to build a solid relationship with the family, activating the possibilities of change and building bridges between families and the professionals (Pakman, 2007).

In fact, an interview which covers such different but complementary areas of family life, can be an useful instrument to several forensic mental health providers like psychiatrists, psychologists, social workers and nurses, enhancing interdisciplinary work.

**Conclusion**

The main goal of this article was to validate the SIFAR through the ICC, convergent validity and prediction role of the structural relationships. SIFAR is divided into complementary forms for adolescents and parents and analyses multiple and complex information items about the family system, taking advantage of relevant but usually scattered data. This instrument requires the supplementary use of actuarial tools to be able to focus on both the individual and family risk factors, crossing-relating family and individual variables so as to understand the criminogenic needs underlying the adolescent’s anti-social behavior and to design intervention’s plans. This combining of tools and methods between the family assessment, individual features and other risk factors could provide a more integrative and structured risk assessment of adolescent offenders, especially because of the relevance of family with adolescent children life stage. The coding of SIFAR within a strategy that adds to the assessment of family strategies to deal with the difficulties, which might work as risk or protective factors, enables practitioners to understand how the family functioning is relevant to the criminal behavior of the adolescent, and how it can be worked to increase the protective factors and decrease the family risk factors involved.

This study has two major limitations: its exploratory design and the use of a convenience sample composed of families of male adolescents in detention. These limitations make it hard to generalize the results, which should therefore be considered in the detention facility-specific context. However, they are promising and the long process

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of validating a family tool will continue with clinical samples, conformity family samples and with the female adolescent offenders.

Compliance with Ethical Standards

Conflict of interest The authors declare no financial support and no potential conflict of interest with respect to the research, authorship, and/or publication of this article.

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