

French version of reactive-proactive aggression questionnaire: psychometrics properties in adolescents

Suter Maya^a, Pihet Sandrine^{bc}, Urben Sébastien^a

^a Division of Child and Adolescent Psychiatry, University Hospital of Lausanne (CHUV), Lausanne, Switzerland

^b Department of Psychology, University of Fribourg, Fribourg, Switzerland

^c School of nursing, University of Applied Sciences and Art of Western Switzerland, Fribourg, Switzerland

Summary

This study examined the psychometric properties of the French version of the reactive-proactive aggression questionnaire (RPQ). A total of 124 adolescents from the general population and 134 institutionalised adolescents completed the French version of the RPQ, along with other measures of externalising behaviours (aggression and delinquency), psychopathic traits and impulsivity. A confirmatory factor analysis supports the two-factor structure, namely proactive and reactive. Good internal consistency in both samples was observed. The construct validity was adequate with correlations between (1) both forms of aggression and externalising behaviours, (2) reactive aggression and impulsivity, and (3) proactive aggression and psychopathic traits. Moreover, the institutionalised group reported higher proactive and reactive aggression compared with the community one whereas boys reported higher proactive aggression than girls. The French version of the RPQ had adequate psychometric properties indicating its validity and utility.

Keywords: adolescents, reactive aggression, proactive aggression, psychopathic traits, impulsivity, reactive-proactive aggression questionnaire

Introduction

Aggressive behaviour during adolescence has been reported to be an important risk factor for negative outcomes such as delinquency [1, 2]. Much effort has been invested in the identification of psychological mechanisms that might underline aggressive behaviours and therefore be targeted by prevention or intervention.

One important step in the understanding of aggression referred to the conception of aggression of Raine and colleagues [3], which distinguishes between reactive (in response to provocation and frustration) and proactive (goal-oriented behaviour designated to achieve an aim beyond physical violence) forms of aggression. In particular, reactive aggression has generally been associated with negative emotions, such as anger or feelings of animosity,

is aimed at causing harm to others, and involves impulsivity and immediacy [4]. On the other hand, proactive aggression has been characterised as a planned, instrumental type of behaviour and is implemented in order to reach a personal goal or other types of benefits [5, 6]. The aetiology, development and psychological difficulties related to these different forms of aggressive behaviours diverged (e.g., [7–10]). Indeed, reactive aggression has been related to negative outcomes such as social maladjustment, peer rejection, impulsivity or internalising problems [11]. In contrast, proactively aggressive children may feel more self-confident, are viewed by others as leaders [12, 13], but are more prone to present delinquent and disruptive behaviours (e.g., [5]).

In order to assess both dimensions of aggression, Raine and colleagues [3] developed the reactive and proactive aggression questionnaire (RPQ), a 23-item self-report questionnaire composed of a reactive aggression dimension and a proactive aggression dimension. Up to now, the RPQ has demonstrated satisfactory psychometric properties (i.e., factorial structure, internal consistency, construct validity) in several studies using the original English version [3], or translations into Dutch, Italian, Portuguese or Turkish [14–19]. Moreover, Cima et al. [14] observed different relationships between the two forms of aggression and impulsivity (more strongly related to the reactive form of aggression) and psychopathic traits (more strongly related to the proactive form of aggression). Additionally, non-offender participants scored significantly lower than offender participants [14]. Boys reported higher proactive aggression but comparable reactive aggression compared with girls [16].

To our knowledge, there has been no assessment of the psychometric properties of the RPQ in French-speaking adolescents. Therefore, this study aimed at assessing the psychometric properties (i.e., factorial structure, reliability and construct validity) of the French-version of the RPQ.

Data access

Data are available on Zenodo repository (Dataset French version of reactive-proactive aggression questionnaire: Assessment of psychometrics properties in adolescent samples; DOI:10.5281/zenodo.1297588).

Correspondence:

Sébastien Urben, Division of Child and Adolescent Psychiatry, University Hospital of Lausanne, Av. Echallens 9, CH-1004 Lausanne, Switzerland. [Urben\[at\]chuv.ch](mailto:Urben[at]chuv.ch)

Methods

Study groups

Both groups were recruited in the French-speaking part of Switzerland and were assessed during the same period of time (between December 2010 and April 2013).

Institutionalised sample

A total of 135 institutionalised adolescents (25% girls and 75% boys) were recruited from two forensic facilities ($n = 75$), two boarding schools ($n = 47$) accommodating adolescents with behavioural and/or learning difficulties, and one public school's special class for adolescents with behavioural and/or learning difficulties ($n = 12$). Mean age was 14.96 years (standard deviation [SD] 1.16). Based on father's and mother's jobs, socioeconomic status (SES) was determined. Low SES applied to 36% of this sample, 34% came from middle SES families and 30% from high SES families.

Community sample

A total of 124 adolescents from the general population, with a mean age of 14.52 years (SD 0.95), including 46.7% girls, were recruited from seven classes coming from two public schools. SES was not formally assessed for this sample.

The community sample was younger ($t(249) = 3.27$, $p < 0.001$) and included more girls ($\chi^2(1) = 12.55$, $p < 0.001$) compared with the institutionalised group.

Measures

All questionnaires used are self-report measures.

Reactive and proactive aggression was assessed with the RPQ [3], which comprises two specific scales: the reactive aggression scale and the proactive aggression scale. The reactive aggression scale is composed of 11 items such as "Hit others to defend yourself", and the proactive aggression scale is composed of 12 items such as "Used force to get money or things from others." Each item was rated on a three-point Likert scale (0 = "never" to 2 = "often"), assessing the extent to which the participants engage in the two forms of aggression. The questionnaire was translated in accordance with cross-cultural research guidelines [20]: the English-version items were translated into French by a culturally informed native French speaker fluent in English and then the resulting items were translated back into English by a native English speaker fluent in French. The two translators then discussed and resolved any differences from the original items.

Externalising behaviours were assessed using the externalising scale of the French version of Youth Self-Report (YSR) version of the Child Behaviour Checklist [21, 22]. This questionnaire lists 113 specific problems commonly found in children and adolescents, and consists of two scales that reflect externalising and internalising problems. In the present study, we used only the externalising scale, which includes aggressive behaviour and delinquent behaviour subscales. For instance, aggressive behaviour is assessed by items such as "Fights often" whereas delinquent behaviours is assessed by items such as "Lie or cheat". Items are scored from 0 = "not true" to 2 = "often true", rated over the last 12 months. Good reliability and

validity have been demonstrated [23], as well as acceptable test-retest reliability and construct validity [21]. In the present study, the aggression scale and delinquent scale showed good internal consistencies with Cronbach's alphas of 0.85 and 0.84, respectively.

Psychopathic traits were assessed with the Youth Psychopathic Traits Inventory (YPI) [24], a 50-item self-report questionnaire. To reduce the influence of social desirability on responses and to facilitate endorsement, the YPI describes feelings and opinions as competences, rather than deficiencies. The YPI measures three core dimensions of psychopathy: (1) interpersonal (dishonesty, lying and manipulation, for instance: "I can convince others to almost all things"), (2) affective (callous-unemotional traits; for instance: "I feel calm when others are frightened") and (3) lifestyle (impulsivity and irresponsibility; for instance: "I probably have missed school or work more than others"). Participants were asked to estimate the degree to which each individual item applied to them, using a four-point Likert scale ranging from 1 = "does not apply at all" to 4 = "applies very well".

The YPI has shown good psychometric properties for the original English version [25] as well as for the French translation used in the current study [26, 27]. The Cronbach's alphas in the current sample are: interpersonal 0.91; affective 0.83; lifestyle 0.87.

Procedures

The procedures were approved by the local Ethics Committee for research on humans.

Procedures in the institutionalised sample

Agreement was obtained from the directors of the institutions (forensic or boarding) prior to the beginning of the study. Written informed consent was obtained from the adolescents and their legal guardians (parents and/or judge) after the research had been presented and the confidentiality of responses and freedom to withdraw from the study at any time without consequences guaranteed. The adolescents completed the questionnaires during an individual session with a research psychologist. Data collection, including a number of other measures not reported here, lasted around 5 hours (for other results, see e.g., [28–32]).

Procedures in the community sample

Formal agreements from the school principals and informed consent from each student and his/her parents were obtained prior to the beginning of the procedure. Confidentiality of the data was guaranteed. Students willing to participate completed the questionnaires, individually and anonymously, within two class periods of 45 minutes under the supervision of trained psychologists.

Data analysis

Data analyses followed the COnsensus-based Standards for the selection of health Measurement Instruments (COSMIN) guidelines [33]. The data were analysed with SPSS v.21 and Mplus v.7.11. Missing data were taken into account using a pairwise procedure. First, the factor structure of the data was tested by computing two confirmatory factor analyses. Specifically, the goodness-of-fit of

two models were compared: a one-factor model consisting of a total score and the two-factor model (reactive and proactive factors) proposed by the developers of the RPQ. The goodness-of-fit of the solution was assessed by computing different indices: the comparative fit index, (CFI), the Tucker-Lewis index (TLI), the standardised root mean square residual (SRMR), the root mean square error of approximation (RMSEA) and the Akaike information criterion (AIC). To have a good fit of our models regarding the observed data, CFI and TLI values were expected to be around 0.90 and SRMR and RSMEA below 0.08 [34, 35]. A smaller AIC indicates a better approximation of the data in the model. A difference chi-square test [36] was computed to assess the differences between both models (one-factor vs two-factor). Then *the reliability* of the scales were assessed with Cronbach's alpha. Afterwards *the construct validity* of the reactive and proactive scales was assessed by computing their correlations with the YSR subscales (aggression delinquency) using Spearman's rho (as proactive RPQ did not follow a Gaussian-like distribution). As both RPQ scales were highly correlated ($\rho(111) = 0.71, p < 0.001$) and thus shared a great part of common variance, we computed the unstandardised residuals from regression analyses (reactive RPQ regressed on proactive PRQ and conversely). Then, Spearman's rhos were computed between RPQ scales residuals and YPI scales. This procedure has been adopted in previous studies (e.g., 14]) testing the construct validity of the RPQ. Finally, we used Mann-Whitney tests to compare the scores of the institutionalised sample with those of the community one. As these two samples differed in terms of gender and age, we computed multivariate analyses of covariance (MANCOVA) to confirm the results of the Mann-Whitney tests. Finally, gender comparisons on the reactive and proactive RPQ were investigated solely in the community group, using nonparametric Mann-Whitney tests, owing to the low representation of girls in the institutionalised sample.

Results

Confirmatory factor analysis

Table 1 presents the results of the confirmatory factor analyses.

The goodness-of-fit indices were better for the two-factor model than for the one-factor model. A difference chi-square test [36] indicated that the two-factor model fitted the data significantly better than the one-factor model ($p < 0.001$). All indices fell in their expected range and indicated a very good fit of the two-factor solutions. Figure 1 illustrates the detailed results of the two-factor solution. The sample size for these analyses was 234 and indices were estimates with a maximum likelihood procedure.

Internal consistency

The internal consistency of both scales was computed on the complete sample (combining the institutionalised and

community samples) using Cronbach's alpha, as well as separately for both samples. On the entire sample, results revealed good internal consistency with $\alpha = 0.84$ ($n = 229$) for the reactive RPQ and $\alpha = 0.89$ ($n = 228$) for the proactive RPQ. For the institutionalised sample the Cronbach's alphas were 0.87 ($n = 107$) for the reactive RPQ and 0.90 ($n = 108$) for the proactive RPQ, whereas for the community sample they were 0.76 ($n = 122$) and 0.74 ($n = 120$) for the reactive and proactive RPQ, respectively.

Construct validity

Correlations

In the institutionalised sample, the reactive and proactive RPQ correlated positively and significantly with the aggression YSR (with the reactive RPQ: $\rho(107) = 0.64, p < 0.001$; with the proactive RPQ: $\rho(107) = 0.64, p < 0.001$) and delinquent scale of the YSR (with reactive RPQ: $\rho(107) = 0.55, p < 0.001$; with proactive RPQ: $\rho(107) = 0.59, p < 0.001$). The unstandardised residuals of the reac-

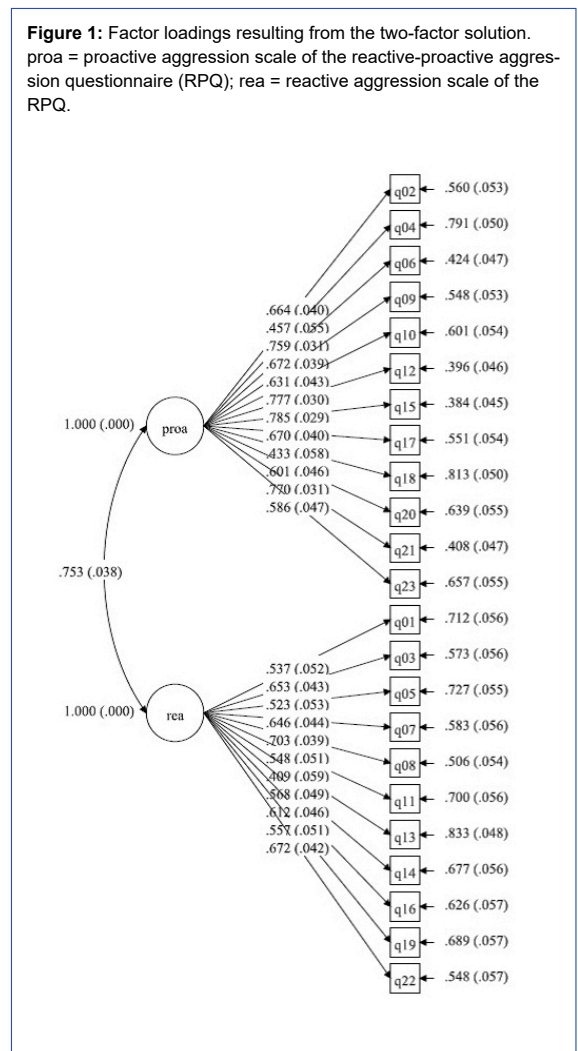


Figure 1: Factor loadings resulting from the two-factor solution. proa = proactive aggression scale of the reactive-proactive aggression questionnaire (RPQ); rea = reactive aggression scale of the RPQ.

Table 1: Model fit of the two models tested on the whole sample.

Model	χ^2	df	AIC	CFI	TLI	SRMR	RMSEA
One-factor	691.9	230	7677.5	0.787	0.766	0.076	0.093
Two-factor	539.3	229	7526.9	0.857	0.842	0.067	0.076

df = degrees of freedom; AIC = Akaike information criterion; CFI = comparative fit index; TLI = Tucker-Lewis index; SRMR = standardised root mean square residual; RMSEA = Root mean square error of approximation

tive RPQ were also positively and significantly correlated with lifestyle on the YPI ($\rho(104) = 0.34, p < 0.001$), but not with affective YPI ($\rho(104) = -0.07, p > 0.05$) or with interpersonal YPI ($\rho(104) = 0.01, p > 0.05$). In contrast, unstandardised residuals of the proactive RPQ correlated positively and significantly with the affective YPI ($\rho(104) = 0.39, p < 0.001$) and interpersonal YPI ($\rho(104) = 0.41, p < 0.001$), but not with the lifestyle YPI ($\rho(104) = 0.19, p > 0.05$).

Group differences.

The institutionalised sample ($n = 111$) showed significantly higher scores than the community sample ($n = 123$) on the reactive RPQ ($z = 4.50, p < 0.001$) and the proactive RPQ ($z = 4.62, p < 0.001$). Controlling for differences between these samples on age and gender within a MANCOVA confirmed the differences on the reactive RPQ ($F(1, 224) = 25.31, p < 0.001$) and proactive RPQ ($F(1, 224) = 33.42, p < 0.001$).

Gender differences were also observed in the community sample: boys reported significantly ($z = -5.78, p < 0.001$) more proactive RPQ (mean 0.21, SD 0.17, $n = 63$) than girls (mean 0.06, SD 0.14, $n = 56$), whereas no significant gender differences ($z = -1.47, n.s.$) were found on the reactive RPQ (girls: mean 0.59, SD 0.31, $n = 63$; boys: mean 0.67, SD 0.30, $n = 56$). No gender differences were observed in the institutionalised sample either for proactive RPQ (girls: mean 0.33, SD 0.43, $n = 30$; boys: mean 0.44, SD = 0.42, $n = 80$; $z = -1.65, n.s.$) or reactive RPQ (girls: mean 1.00, SD 0.53, $n = 30$; boys: mean 0.87, SD = 0.43, $n = 80$; $z = -1.00, n.s.$).

Discussion

The present study examined the psychometric properties of the RPQ. The confirmatory factor analysis confirmed the same two-factor structure as in the original version of the RPQ [3], as well as in previous translations [14–19]. With regard to the internal consistency, Cronbach's alpha values suggested adequate reliability of the RPQ scales. Moreover, the construct validity of the reactive and proactive dimensions were supported by the current results: both aggression scales showed moderate to high significant positive correlations with the aggression and delinquency scales of the YSR, and discriminated between institutionalised and community adolescents. In contrast, each specific aggression scale correlated with different constructs (impulsivity for reactive aggression and callous-unemotional traits for proactive aggression), and boys scored higher than girls on proactive aggression only.

Results highlighted the usefulness of the RPQ in discriminating between institutionalised and community samples as well as between genders, as previously observed [14]. The co-occurrence of aggressive behaviours and delinquent behaviour, as observed also in the current study, is well-established [21, 37]. As previously observed [16], boys reported higher proactive (but not reactive) forms of aggression than girls. Reactive aggression can be viewed as a quasi-normative behaviour indicating an adaptive reaction in certain circumstances. Indeed, adolescence is a period of life that is characterised by significant brain development in regions underpinning processes relevant to reactive aggression, such as threat evaluation and self-con-

trol [38]. Some studies have examined the overlap between reactive aggression and anxious behaviours and found that both issues are often associated [39]. Indeed, some research has shown that the conceptualisation of anxiety and aggression can be seen as components of the larger fight-or-flight system, which describes the body's normal physiological response to threatening stimuli in the environment [40]. This response of the body when in a perceived threatening situation might lead to reactive aggression. Therefore, the lack of gender differences on the reactive dimension of aggression was expected. In contrast, proactive aggression represents a pathological form of aggression [3] and it has already been demonstrated that rates of proactive aggression are higher in boys than in girls during adolescence, probably because of their increasing physical advantage [16].

This study showed that the French version of the RPQ possesses appropriate psychometric properties. This instrument is an important tool as reactive aggression was found to be associated with adolescent-onset forms of depression that persist into adulthood, as well as with alcohol and substance use in adulthood [41], whereas proactive aggression was linked with increased levels of antisocial behaviour and adult psychopathic features [42].

Limitations

The size of our two groups was moderate, which did not allow the stability of the factor structure to be tested across more narrowly defined groups differing in age, gender or risk status. The replication of the superiority of the two-factor model over the one-factor one is warranted in larger community and clinical samples. Our study design was cross-sectional and longitudinal studies would be useful to assess the stability of the RPQ scales (i.e., test-retest). SES was not formally assessed in the community samples and therefore might have influenced the between-sample analyses. The testing procedure between the samples (i.e., individual sessions vs class sessions), which may have impacted the responses of the individuals.

Conclusions

The present study provides evidence of appropriate psychometric properties of the French-version of the RPQ. Thus, the French RPQ is a useful tool to assess proactive and reactive aggression in clinical practice, as well as in research studies in the French-speaking community.

Acknowledgements

The authors would like to thank the adolescents and the staff of the participating institutions for their kind cooperation, as well as Sandie Ackermann, Cybèle Bertoni, Tamara Borovicainin, Marcello Cantarella, Margaux Clément, Nathalie Grégoire, Tatiana Mabillard, Laura Moizeau, Sheila Ramos and Yoann Uehlinger for their help in data collection.

Financial disclosure

The study was funded by a grant from the Swiss National Science Foundation (grant no. 100014-130553) and the Research Fund of the University of Fribourg.

Potential competing interests

The authors have no conflict of interest to disclose.

References

- 1 Loeber R, Dishion T. Early predictors of male delinquency: a review. *Psychol Bull.* 1983;94(1):68–99. doi: <http://dx.doi.org/10.1037/0033-2909.94.1.68>. PubMed.
- 2 Jennings WG, Reingle JM. On the number and shape of developmental/life-course violence, aggression, and delinquency trajectories: A state-of-the-art review. *J Crim Justice.* 2012;40(6):472–89. doi: <http://dx.doi.org/10.1016/j.jcrimjus.2012.07.001>.
- 3 Raine A, Dodge K, Loeber R, Gatzke-Kopp L, Lynam D, Reynolds C, et al. The reactive-proactive aggression questionnaire: Differential correlates of reactive and proactive aggression in adolescent boys. *Aggress Behav.* 2006;32(2):159–71. doi: <http://dx.doi.org/10.1002/ab.20115>. PubMed.
- 4 Dollard J, Doob LW, Miller NE, Mowrer OH, Sears RR, Ford CS, et al. *Frustration and aggression.* New Haven: Yale University Press 1939.
- 5 Card NA, Little TD. Proactive and reactive aggression in childhood and adolescence: A meta-analysis of differential relations with psychosocial adjustment. *Int J Behav Dev.* 2006;30(5):466–80. doi: <http://dx.doi.org/10.1177/0165025406071904>.
- 6 Polman H, Orobio de Castro B, Koops W, van Boxtel HW, Merk WW. A meta-analysis of the distinction between reactive and proactive aggression in children and adolescents. *J Abnorm Child Psychol.* 2007;35(4):522–35. doi: <http://dx.doi.org/10.1007/s10802-007-9109-4>. PubMed.
- 7 Bandura A. *Social foundations of thought and action: A social cognitive theory.* Englewood Cliffs N.J.: Prentice-Hall; 1986.
- 8 Dollard J, Miller NE, Ford CS, Hovland CL. *Frustration and aggression.* New Haven: Yale University Press; 1939.
- 9 Girard LC, Tremblay RE, Nagin D, Côté SM. Development of aggression subtypes from childhood to adolescence: A group-based multi-trajectory modelling perspective. *J Abnorm Child Psychol.* 2019;47(5):825–38. doi: <http://dx.doi.org/10.1007/s10802-018-0488-5>. PubMed.
- 10 Jambon M, Colasante T, Peplak J, Malti T. Anger, sympathy, and children's reactive and proactive aggression: Testing a differential correlate hypothesis. *J Abnorm Child Psychol.* 2019;47(6):1013–24. doi: <http://dx.doi.org/10.1007/s10802-018-0498-3>. PubMed.
- 11 Dodge KA, Crick NR. Social information-processing bases of aggressive-behavior in children. *Pers Soc Psychol Bull.* 1990;16(1):8–22. doi: <http://dx.doi.org/10.1177/0146167290161002>.
- 12 Crick NR, Dodge KA. Social information-processing mechanisms in reactive and proactive aggression. *Child Dev.* 1996;67(3):993–1002. doi: <http://dx.doi.org/10.2307/1131875>. PubMed.
- 13 Dodge KA, Coie JD. Social-information-processing factors in reactive and proactive aggression in children's peer groups. *J Pers Soc Psychol.* 1987;53(6):1146–58. doi: <http://dx.doi.org/10.1037/0022-3514.53.6.1146>. PubMed.
- 14 Cima M, Raine A, Meesters C, Popma A. Validation of the Dutch reactive proactive questionnaire (RPQ): Differential correlates of reactive and proactive aggression from childhood to adulthood. *Aggress Behav.* 2013;39(2):99–113. doi: <http://dx.doi.org/10.1002/ab.21458>. PubMed.
- 15 Fossati A, Raine A, Borroni S, Bizzozero A, Volpi E, Santalucia I, et al. A cross-cultural study of the psychometric properties of the Reactive-Proactive Aggression Questionnaire among Italian nonclinical adolescents. *Psychol Assess.* 2009;21(1):131–5. doi: <http://dx.doi.org/10.1037/a0014743>. PubMed.
- 16 Fung AL, Raine A, Gao Y. Cross-cultural generalizability of the reactive-proactive aggression questionnaire (RPQ). *J Pers Assess.* 2009;91(5):473–9. doi: <http://dx.doi.org/10.1080/00223890903088420>. PubMed.
- 17 Cenkseven-Önder F, Avci R, Çolakkadıoğlu O. Validity and reliability of the reactive-proactive aggression questionnaire in Turkish adolescents. *Educ Res Rev.* 2016;11(20):1931–43. doi: <http://dx.doi.org/10.5897/ERR2016.2937>.
- 18 Pechorro P, Ayala-Nunes L, Kahn R, Nunes C. The reactive-proactive aggression questionnaire: Measurement invariance and reliability among a school sample of portuguese youths. *Child Psychiatry Hum Dev.* 2018;49(4):523–33. doi: <http://dx.doi.org/10.1007/s10578-017-0772-6>. PubMed.
- 19 Pechorro P, Ray JV, Raine A, Maroco J, Gonçalves RA. The reactive-proactive aggression questionnaire: Validation among a Portuguese sample of incarcerated juvenile delinquents. *J Interpers Violence.* 2017;32(13):1995–2017. doi: <http://dx.doi.org/10.1177/0886260515590784>. PubMed.
- 20 Brislin RW. Back-translation for cross-cultural research. *J Cross Cult Psychol.* 1970;1(3):185–216. doi: <http://dx.doi.org/10.1177/135910457000100301>.
- 21 Achenbach TM. *Manual for the youth self-report and 1991 profiles.* Burlington: University of Vermont, Department of Psychiatry; 1991.
- 22 Vermeersch S, Fombonne E. Le Child Behavior Checklist: Résultats préliminaires de la standardisation de la version française. *Neuropsychiatr Enfance Adolesc.* 1997;45:615–20.
- 23 Vreugdenhil C, van den Brink W, Ferdinand R, Wouters L, Doreleijers T. The ability of YSR scales to predict DSM/DISC-C psychiatric disorders among incarcerated male adolescents. *Eur Child Adolesc Psychiatry.* 2006;15(2):88–96. doi: <http://dx.doi.org/10.1007/s00787-006-0497-8>. PubMed.
- 24 Andershed H, Kerr M, Stattin H, Levander S. Psychopathic traits in non-referred youths: A new assessment tool. In: Blaauw E, Sheridan L, editors. *Psychopaths: Current international perspectives.* The Hague: Elsevier; 2002. p. 131–58.
- 25 Skeem JL, Cauffman E. Views of the downward extension: Comparing the youth version of the psychopathy checklist with the youth psychopathic traits inventory. *Behav Sci Law.* 2003;21(6):737–70. doi: <http://dx.doi.org/10.1002/bsl.563>. PubMed.
- 26 D'Acremont M, Van der Linden M, Axelson H, Flykt A, Vonèche J. French version of the youth psychopathic inventory: Unpublished manuscript; 2002.
- 27 Pihet S, Suter M, Meylan N, Schmid M. Factor structure of the youth psychopathic traits inventory: Using the total score, three scale scores, and/or 10 subscale scores. *Crim Justice Behav.* 2014;41(10):1214–31. doi: <http://dx.doi.org/10.1177/0093854814540287>.
- 28 De Ridder J, Pihet S, Suter M, Caldara R. Empathy in institutionalized adolescents with callous-unemotional traits: An ecological momentary assessment study of emotion recognition. *Crim Justice Behav.* 2016;43(5):653–69. doi: <http://dx.doi.org/10.1177/0093854815618431>.
- 29 Pihet S, De Ridder J, Suter M. Ecological momentary assessment (EMA) goes to jail capturing daily antisocial behavior in its context, a feasibility and reliability study in incarcerated juvenile offenders. *Eur J Psychol Assess.* 2017;33(2):87–96. doi: <http://dx.doi.org/10.1027/1015-5759/a000275>.
- 30 Suter M, Pihet S, Zimmermann G, de Ridder J, Urben S, Stephan P. Predicting daily-life antisocial behaviour in institutionalized adolescents with transgression-related implicit association tests. *J Forensic Psychol Ps.* 2017;28(6):881–900. doi: <http://dx.doi.org/10.1080/14789949.2017.1332772>.
- 31 Suter M, Urben S, Pihet S, Bertoni C, De Ridder J, Stephan P. Which type of self-esteem predicts reactive and proactive aggression in adolescent boys and girls? *Journal of Adolescent and Family Health.* 2015;7(2):1.
- 32 Urben S, Habersaat S, Pihet S, Suter M, de Ridder J, Stéphan P. Specific contributions of age of onset, callous-unemotional traits and impulsivity to reactive and proactive aggression in youths with conduct disorders. *Psychiatr Q.* 2018;89(1):1–10. doi: <http://dx.doi.org/10.1007/s11126-017-9506-y>. PubMed.
- 33 Prinsen CAC, Mokkink LB, Bouter LM, Alonso J, Patrick DL, de Vet HCW, et al. COSMIN guideline for systematic reviews of patient-reported outcome measures. *Qual Life Res.* 2018;27(5):1147–57. doi: <http://dx.doi.org/10.1007/s11126-017-9506-y>. PubMed.
- 34 Hu L, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Struct Equ Model.* 1999;6(1):1–55. doi: <http://dx.doi.org/10.1080/10705519909540118>.
- 35 Smeets RJ, Beelen S, Goossens ME, Schouten EG, Knottnerus JA, Vlaeyen JW. Treatment expectancy and credibility are associated with the outcome of both physical and cognitive-behavioral treatment in chronic low back pain. *Clin J Pain.* 2008;24(4):305–15. doi: <http://dx.doi.org/10.1097/AJP.0b013e318164aa75>. PubMed.
- 36 Loehlin JC. *Latent variable models: An introduction to factor, path, and structural analysis* 2nd ed. Mahwah, New Jersey: Lawrence Erlbaum Associates; 1992.
- 37 Bartels M, Hudziak JJ, van den Oord EJCG, van Beijsterveldt CEM, Rietveld MJH, Boomsma DI. Co-occurrence of aggressive behavior and rule-breaking behavior at age 12: multi-rater analyses. *Behav Genet.* 2003;33(5):607–21. doi: <http://dx.doi.org/10.1023/A:1025787019702>. PubMed.
- 38 Mills KL, Goddings A-L, Clasen LS, Giedd JN, Blakemore S-J. The developmental mismatch in structural brain maturation during adolescence. *Dev Neurosci.* 2014;36(3-4):147–60. doi: <http://dx.doi.org/10.1159/000362328>. PubMed.
- 39 Fite PJ, Raine A, Stouthamer-Loeber M, Loeber R, Pardini DA. Reactive and proactive aggression in adolescent males: Examining differential outcomes 10 years later in early adulthood. *Crim Justice Behav.* 2009;37(2):141–57. doi: <http://dx.doi.org/10.1177/0093854809353051>. PubMed.
- 40 Kunimatsu MM, Marsee MA. Examining the Presence of Anxiety in Aggressive Individuals: The Illuminating Role of Fight-or-Flight Mech-

- anisms. *Child Youth Care Forum*. 2012;41(3):247–58. doi: <http://dx.doi.org/10.1007/s10566-012-9178-6>.
- 41 Fite PJ, Raine A, Stouthamer-Loeber M, Loeber R, Pardini DA. REACTIVE AND PROACTIVE AGGRESSION IN ADOLESCENT MALES: Examining Differential Outcomes 10 Years Later in Early Adulthood. *Crim Justice Behav*. 2009;37(2):141–57. doi: <http://dx.doi.org/10.1177/0093854809353051>. PubMed.
- 42 Fite PJ, Stoppelbein L, Greening L. Proactive and reactive aggression in a child psychiatric inpatient population. *J Clin Child Adolesc Psychol*. 2009;38(2):199–205. doi: <http://dx.doi.org/10.1080/15374410802698461>. PubMed.