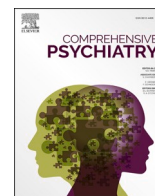Contents lists available at ScienceDirect

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Associations between the Personality Inventory for DSM-5 trait facets and aggression among outpatients with personality disorder: A multimethod study

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ABSTRACT

Background: Most research on the Personality Inventory for DSM-5 (PID-5) was conducted with self-reports. One of the specific areas for which a multimethod design has yet to be implemented is for the PID-5's associations with aggression. The main objectives of this study were to (a) compare the PID-5 associations with self-reported and file-rated aggression, (b) compare these associations between women and men, and (c) identify the relative importance of PID-5 facet predictors.

Methods: A sample of outpatients with personality disorder ($N = 285$) was recruited in a specialized public clinic to complete questionnaires, and a subsample was assessed for file-rated aggression ($n = 227$). Multiple regression analyses were performed with PID-5 facets as statistical predictors but using distinct operationalizations of aggression (self-reported vs. file-rated). Moderation analyses were performed to identify the moderating effect of biological sex. Dominance analyses were computed to identify the relative importance of predictors.

Results: PID-5 facet predictors of self-reported and file-rated aggression were very consistent in both conditions. However, the amount of explained variance was reduced in the latter case (from 39% to 14%), especially for women (from 40% to 2%). The most important predictors were Hostility, Risk Taking, and Callousness.

Conclusion: Pertaining to the statistically significant facets associated with aggression, strong evidence of multimethod replication was found. The women-men discrepancies were not most obvious in their specific associations with aggression, but rather in their amount of explained variance, maybe reflecting examiners' or patients' implicit biases, and/or different manifestations of aggression between women and men.

1. Introduction

1.1. The alternative model for personality disorders

In Section III of the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM-5* [1]), the Alternative Model for Personality Disorders (AMPD) was introduced as a candidate to replace the categorical classification for personality disorders (PDs). Its hybrid categorical-dimensional design seeks to build on current knowledge about personality, improve the utility of diagnoses, and mitigate some of the short-comings associated with the current approach to classifying PDs (e.g., poor reliability, heterogenous clinical presentations, high comorbidity rates [2]). The dimensional core of the AMPD resides in two criteria. Criterion A captures general, personality-based impairment pertaining to self (Identity, Self-Direction) and interpersonal (Empathy, Intimacy) functioning and is the basis to decide whether a patient qualifies for a formal PD diagnosis. Criterion B—the focus of this study—is based on a hierarchical model of personality that mostly taps into extreme, maladaptive variants of the Five-Factor Model (FFM) traits [3]. These traits include 25 maladaptive facets grouped into five higher-order domains: Negative Affect, Detachment, Antagonism, Disinhibition, and Psychoticism.

Criterion B can be assessed using the Personality Inventory for *DSM-5* (PID-5 [4]), a 220-item self-report officially copyrighted by the APA. It has been the object of numerous studies, translated into several languages, and has shown sound psychometric properties (for a review, see Zimmermann et al. [5]). Despite a fast-growing evidence base, one of the main limitations of the AMPD literature is the paucity of multimethod studies (i.e., combining self-reports, interviews, informant reports, etc.), which is problematic since a single methodology (usually self-reports) might artificially "inflate validity estimates" via shared variance ([5], p. 7). This phenomenon is sometimes referred to as "criterion contamination" [6].

1.2. Multimethod assessment

Multimethod assessment is a fundamental part of clinical practice, which allows to reduce sources of biases (for a thorough review, see Meyer et al. [6]). Thus, the relative absence of multimethod AMPD studies is particularly surprising considering the lingering concerns about self-other agreement in FFM (which is largely overlapping with the PID-5 [3]) and PD research. Some reviews suggest modest self-other agreement (e.g., [7]), some suggest that it depends on whether the bulk of the pathology is internalized and/or externalized (e.g., [8]), while others suggest moderate agreement (e.g., [9,10]). What seems consistent, though, is that different methods capture a nonnegligible amount of unique information not simply attributable to measurement error [6,11].

The same concerns hold true for self-other agreement about the disclosure of socially reprehensible acts, such as aggression, a field that has surprisingly been the object of a limited number of cross-method (rather than cross-instrument) studies among adults, with few exceptions (e.g., [12,13]). In the AMPD field, the convergence between the PID-5 traits and different operationalizations of aggression, which would likely each capture unique information, remains unknown. Yet, identifying how the PID-5 relates to aggression (and to which parts of the construct) is important to identify its potential for assessing risk in practice.

1.3. Risk assessment in a therapeutic setting

In a therapeutic setting, pretreatment assessment notably aims to determine current functioning, clarify a diagnosis, and identify treatment goals [6]. In addition, estimating a patient's propensity toward aggression must be part of a clinician's ongoing reflection and assessment to ensure appropriate risk management, regardless of the setting

(e.g., therapeutic, forensic, etc. [14]). Indeed, since all categorical DSM PD diagnoses represent risk factors for the perpetration of aggression [15], clinicians working with PD patients should continuously pay attention to this issue. In addition, aggression propensity seems to be an important prognostic factor, since it has been associated to early treatment drop-out [16], which further underscores its relevance in practice. While clinicians working in the forensic field might have access to a plethora of instruments and information to assess risk, making it the focus of their assessment, so is not typically the case for clinicians working in general mental health or therapeutic settings [14]. Therefore, accessible clinical indicators of aggression propensity from a broad personality measure such as the PID-5, which might also inform treatment planning (e.g., by identifying potential treatment targets), might be valuable.

1.4. Aggression and the AMPD

The existing AMPD-aggression literature has generally focused on identifying how PID-5 domains and facets relate to physical aggression [17–19], as well as to intimate partner violence (IPV [20,21]). The importance of facet-level analysis was previously underscored [17], like it has been before for the FFM [22], and PID-5 Hostility, Callousness, and Risk Taking seem to be the "key facets" involved in physical aggression, at least among male offenders [23]. The latter researchers concluded that the common variance among facets largely explains how the PID-5 statistically predicts aggression, which they interpret as symptomatic of a lack of PID-5 discriminant validity.

Additionally, research on IPV suggests differential sex effects, with some different domains and facets predicting IPV in women and men [20,21]. However, these findings may or may not generalize to broader tendencies toward physical aggression outside the marital context. Further investigation of these differences is important considering that both aggression and personality are likely influenced by biological sex (e.g., [24,25]), to a degree that led some researchers to call for a more "specific" study of aggression among women (e.g., [24,26]). For instance, recent reviews have concluded that women could be as likely as men to commit aggression, but it might be manifested differently and cause less physical damage. Nevertheless, the aggression literature pertaining to women has substantially more empirical gaps [24,26].

One major limitation of previous AMPD-aggression (and AMPD-IPV) studies is an exclusive reliance on self-reports [17–21]. Monomethod assessment might be biased because, for instance, in non-AMPD aggression research, self-reported aggression and file-rated aggression were unrelated [13]. To further complicate the matter, another multi-method study revealed that self-reported and clinician-rated aggression were strongly related, but both were only weakly related to official records of violent offenses [12]. From a conceptual point of view, mono-method research might lead to potentially exaggerated, or even flawed, conclusions. From a practical point of view, when clinical decision-making is at stake (e.g., estimating a patient's risk of harm to others), relying on biased research results might lead to dire consequences such as inappropriate management and treatment [12]. Therefore, multi-method replication seems important to improve the confidence that clinicians can put on PID-5 facets as indicators of aggression propensity.

1.5. The present study

This multimethod, cross-sectional study has four objectives: (a) to replicate previously identified associations between the PID-5 and self-reported aggression [17,19] among outpatients with personality disorder; (b) to cross-validate those associations with both self-reported and file-rated aggression; (c) to verify if those associations are comparable between women and men; and (d) to identify the relative importance of predictors. For objective (a), it is predicted that Hostility and Risk Taking will be significant predictors of self-reported aggression (based on Dunne et al. [17]), while prediction by Callousness is possible

although uncertain (based on Somma et al. [19]). For objective (b), it is predicted that PID-5 associations should be more strongly related to self-reported aggression than file-rated aggression (since different methodologies usually lead to smaller correlations; e.g., [6]). For objective (c), it is predicted that some differences among PID-5 facet predictors should emerge between women and men (based on IPV research [20,21]). Objective (d) is in continuity with previous research [23] that aimed at ranking predictors for practical considerations (e.g., facets associated with a higher risk). For instance, identifying which facets have the most crucial role in the prediction of physical aggression might help clinicians to have some sort of valuable clinical heuristic to use in their assessment. Dunne et al. [23] already made a first most-welcome attempt to identify the importance of predictors by using a commonality analysis. In order to try to replicate Dunne et al.'s results, an analysis that is much more straightforward in interpretation is dominance analysis (detailed in the Methods section). It is considered as one of the two best available techniques to compare predictors (along with relative weights [27]). Based on Dunne et al.'s results, it is predicted that dominance analysis should identify Hostility, Risk Taking, and Callousness as the most important (risk-increasing) facets in the statistical prediction of physical aggression.

2. Material and methods

2.1. Participants and procedures

A sample of outpatients with personality disorder ($N = 289$) from a specialized public clinic was recruited between September 2017 and February 2020 in Quebec City, Canada, to complete a computer-based battery of self-reported questionnaires in the French language during intake; of that number, a subset ($n = 228$) had accessible/sufficient file data to assess file-rated physical aggression. Some had a university degree (19%), were employed in a part- or full-time job (48%), and were married or in a relationship (37%). All participants had to be adults ($\geq$ 18 years old) and were referred to the clinic by a general physician or psychiatrist who identified at least one formal *DSM-5* Section II PD diagnosis. The intake procedure at the clinic includes a computer-based battery of self-report questionnaires along with a two-hour interview, which allowed confirming/reviewing referral diagnoses; a final diagnosis is then consensually determined by a team of six clinical psychologists during weekly meetings. The final list of *DSM-5* Section II PD diagnoses, which was available for 254 patients (87.9%), is the following: 65 narcissistic (22.5%), 48 borderline-narcissistic (i.e., co-morbid borderline and narcissistic PD diagnoses; 16.6%), 46 borderline (15.9%), 41 mixed (i.e., three or more comorbid PDs; 14.2%), 23 not otherwise specified (8.0%), 10 schizotypal (3.5%), six schizoid (2.1%), five syndromic (i.e., PD not the main diagnosis; 1.7%), four antisocial (1.4%), four histrionic (1.4%), and two paranoid (0.7%). All participants consented to grant access to their data for research purposes, which had no impact on provision of services. This research was approved by the Centre intégré universitaire de santé et de services sociaux de la Capitale-Nationale [Integrated University Health and Social Services Center of the Capitale-Nationale] Sectoral Research Ethics Committee in Neurosciences and Mental Health.

2.2. Measures

2.2.1. Self-reported traits

The Personality Inventory for *DSM-5* Faceted Brief Form (PID-5-FBF; [28]) is a 100-item version of the original 220-item PID-5 ([4]; French validation: [29]) abbreviated using Item Response Theory. It is composed of 25 facets ($\alpha = 0.67$ [Cognitive and Perceptual Dysregulation] to 0.91 [Attention-Seeking]) regrouped into five domains: Negative Affect, Detachment, Antagonism, Disinhibition, and Psychoticism. The focus of this study will be put on facets, as recommended in PID-5 [17] and FFM research [22]. Items are rated on a four-point Likert scale (higher score means more trait pathology).

2.2.2. Self-reported physical aggression

The Short-Form Buss-Perry Aggression Questionnaire (BPAQ-SF [30]; French validation: [31]) is a 12-item measure that assesses different components of aggression, i.e., Physical Aggression, Verbal Aggression, Anger, and Hostility, as well as a Total Score. It is a short-ened, psychometrically enhanced, derivation of the 29-item version of the questionnaire [32]. The focus of this study will be put on the Physical Aggression subscale ($\alpha = 0.86$) since it is the outcome of interest (hereinafter referred to as "self-reported aggression"). Items are rated on a six-point Likert scale (higher score means more aggression).

2.2.3. File-rated physical aggression

Patient files were reviewed by two authors of the present study (C. S., D. G.*),* who both have significant clinical experience with PD assessment and treatment (respectively 18 and 13 years). Both evaluators scored 25 randomly selected files and reached an almost perfect agreement (intra-class correlation = 0.992, range 0.981–0.996). All other files were then reviewed by only one of the authors (D. G.). Most files contained at least one detailed evaluation report, which included information pertaining to numerous clinical indicators. One of the important admission criteria to the clinic is a risk of harm to self and others, which is consequently emphasized in clinicians' intake assessment and systematically included in their evaluation report. To put things into context, the prospective patients included in the present study generally have a long history of psychiatric treatment, often going back to their first years of adulthood. Therefore, the psychological report, written by a clinical psychologist after intake, is based on (a) a two-hour interview with the patient, but also, most of the times, (b) numerous previous psychiatric or psychological evaluation reports, and (c) progress notes from previous treatments. When the patient is known to have a criminal record, has a history of violence, and/or directly reports violence not previously documented in the file, the clinical psychologist has the possibility to (d) consult the patient's court register (called "*plumitif*", which contains court records in civil, criminal, and penal matters) through an organization that grants access to judicial information known as the Société québécoise d'information juridique (Quebec Legal Information Society) in the Province of Quebec. Detailed evaluation reports were missing from 58 files because either (a) prospective patients completed the first portion of the intake procedure from the clinic (i.e., self-report computerized questionnaires), but declined to go further in the admission process; or (b) the evaluation report had not been completed or archived. Both evaluators were blind as to PID-5-FBF and BPAQ-SF scores for all patients. Evaluators used a three-point scale to assess antecedents of violence, with scoring anchors inspired by the (Historical Clinical Risk Management-20, Version 3 (HCR-20^{V3} [33]): *no prior physical violence* (0); *possible* (1), corresponding to rare or minor acts of physical violence (i.e., one or two minor acts of violence that did not cause or did not intend to cause serious injury); or *confirmed* (2), corresponding to repeated or severe acts of violence (i.e., at least three occurrences of minor acts, or one severe act causing or intended to cause injuries, or that led to hospitalization). Evaluators were allowed to score mid-points (i.e., 0.5 and 1.5).

2.3. Data diagnostics and analytic strategy

All data were checked to ensure adequate response patterns (e.g., absence of a repeated pattern of 4–3–2-1, suggesting random responding), to rule out protocols with missing data, and to ensure conformity with multivariate assumptions. Two participants had to be removed because of missing data. The rest of the dataset was complete and no protocol showed indices of inadequate responding. For the rest of the data diagnostics, even if their constitution overlap, the subsample with the self-reported aggression variable ($n = 287$) and the subsample with the file-rated indicator variable ($n = 228$) were the object of

independent data analyses (i.e., an outlier or influential case for self-reported aggression was not necessarily an outlier or influential case for the analyses with file-rated aggression). To identify multivariate outliers, a series of Mahalanobis Distance tests ($p < .001$) and influential case tests (e.g., Cook's Distance, DFBeta, etc.) were computed for each of the subsamples; this led to the complete elimination of one patient from all analyses, and three others for the self-reported aggression analyses (final sample: $N = 285$, 176 women, $M_{age} = 33.71$ years old, $SD = 10.55$, 18–69 range). Analyses were conducted using IBM SPSS 28 (descriptive statistics, correlations, regressions, moderations), R 4.1.0 (dominance analyses), and ASA 1.0.0 (coefficient comparisons).

First, descriptive statistics, reliability indices (Cronbach's alphas), and group comparisons between women and men (with variance corrections, as well as bootstrapped bias-corrected and accelerated [BCa] 95% confidence intervals) were computed for each variable. Second, because some variables were not normally distributed, produced outliers, and/or the size of subsample was small, Spearman bivariate correlations were computed between PID-5-FBF facets and each of the outcome variables. To guard against Type I error due to the high number of correlations tested, the α level was lowered to 0.01 for the correlational analyses.

Third, a multiple regression model was computed for each of the two outcome variables (i.e., self-reported aggression and file-rated aggression). To avoid entering a disproportionate number of predictors in relation to sample size, because facets are known to share a lot of common variance [23], and because the self-reported analysis is confirmatory and the file-rated analysis exploratory in nature, a subset of predictors had to be selected. More specifically, the selection was based on the significant Spearman correlation coefficients identified with the file-rated aggression variable (i.e., if the PID-5-FBF facet was significantly correlated [$p < .01$] among females, males and/or the total subsample, it was included into the regression analyses). This yielded a consistent set of predictors for both outcome variables, thus facilitating multimethod comparisons. For all regression models, the Predicted R^2 was computed manually based on the Prediction Sum-of-Squares (PRESS) statistic [34]. In addition to being less influenced by the number of predictors inserted into the model (like the adjusted R^2), it estimates the model's capacity to provide accurate predictions (instead of solely providing information about model fit) by removing each data point in the model and then re-estimating it with the predicted value.

Fourth, to test for the moderating effect of biological sex on the outcomes of interest (self-reported and file-rated physical aggression), a series of regression-based simple moderation analyses was computed with each facet as focal antecedent predictor and biological sex as moderator, for both outcome variables ([2 outcomes*8 facets] = 16 models). In addition, for each model, the remaining facets were entered as covariates. The PROCESS macro for SPSS [35] was used. Statistically significant moderation effects were plotted into a graph to support interpretation.

Fifth, to identify the relative importance of significant predictors, a dominance analysis was computed [36]. It is deemed a rigorous and straightforward way to identify the relative importance of predictors [27]. The particularity of dominance analysis, in comparison with other indices (e.g., standardized regression coefficients), is that it identifies the R^2 change created by each predictor in the analysis and/or how much it reduces the error of estimation while taking out each predictor of the model individually[1] [Footnote 1: The focus will be put on "general dominance weights" (or "contribution averages"), that is, on the average R^2 contribution of each predictor across all nested subsets. Accordingly, one predictor is said to be more "dominant" than another if it makes a more substantial contribution to the model. General dominance weights can be summed up to the full model R^2, yielding a straightforward interpretation (i.e., the predictor with the highest average contribution is considered the most important predictor).] [36]. The relevance of this technique is notably to rank a set of predictors or to determine the most prominent predictor from a given model [36]. More specifically, a series

of quantitative dominance analyses was computed with the "dominanceanalysis" package for R [37]. To simplify the comparisons between women and men, six subgroups were created (one for women/men/total samples, with both the self-reported and the file-rated variables).

Finally, a test of difference in explained variance for independent samples with confidence intervals was computed [38] on the Predicted R^2 to determine if there was a statistically significant difference between women and men (for both the self-reported and file-rated coefficients). This test determines whether the coefficient differs in two populations when inserting the same predictors and predicted variable into the model. The analyses were computed on the female and male subgroups, for both methods (self-reported and file-rated aggression). Variance-stabilizing transformation indices ($z*$) were also computed, which are similar to Fisher's z [38].

3. Results

First, descriptive statistics, group comparisons, and reliability indices are provided as supplemental material (see Table S1). Second, bivariate Spearman correlations between the PID-5-FBF traits and aggression are presented in Table 1. Self-reported and file-rated aggression showed moderate-high correlations ($r_s = 0.45–46$; BCa 95% CI$_{Total Sample}$ [0.34, 0.56]). The triad composed of Callousness, Hostility, and Risk Taking was significantly associated with both measures of aggression (except Risk Taking with file-rated aggression among women). The pattern of associations between self-reported aggression and facets was rather indiscriminate in general. On the contrary, the pattern of associations was much clearer (i.e., more discriminant) between file-rated aggression and facets. The pattern seemed to differ among women ($r_s = 0.25$ [Impulsivity] to 0.34 [Hostility]) and men ($r_s = 0.29$ [Manipulativeness, Suspiciousness] to 0.45 [Risk Taking]). Based on the facets significantly correlated with file-rated aggression (among females, males and/or the total subsample), the consistent set of facet predictors that was used for all subsequent regression-based analyses (i.e., multiple regression analyses, moderation analyses, dominance analyses) is the following: Attention-Seeking, Callousness, Hostility, Impulsivity, Manipulativeness, Risk Taking, Submissiveness, and Suspiciousness.

Third, multiple regression analyses with facets as predictors, including moderation analyses, are presented in Table 2. Callousness, Hostility, Risk Taking, and Submissiveness (negative predictor) were significant predictors of both self-reported (β = −0.17–0.36) and file-rated aggression (β = −0.16–0.22). In the prediction of self-reported aggression, Callousness was moderated by biological sex ($\Delta R^2 = 1.1\%$); Callousness was significant among women ($p = .002$), but not among men ($p = .685$; see Fig. S1). In the prediction of file-rated aggression, Risk Taking was moderated by biological sex ($\Delta R^2 = 2.6\%$); that is, Risk Taking was significant among men ($p = .001$), but not among women ($p = .763$; see Fig. S2).

Fourth, pertaining to the dominance analyses, general dominance weights are displayed in Table 3. When facets were entered as predictors of self-reported aggression, Hostility was the most important predictor for all subgroups (i.e., with an R^2 proportion of 28% for women, 32% for men, and 33% for the total sample, respectively). The most important predictor of file-rated physical aggression was again Hostility (40%) for women, but it was Risk Taking (31%) for men, and Callousness (29%) for the total sample.

Finally, pertaining to the between-sex difference in terms of explained variance for the self-reported aggression variable, no statistically significant difference was found between women (Predicted $R^2 = 0.40$, $n = 174$) and men (Predicted $R^2 = 0.36$, $n = 109$), $\Delta = 0.04$, 95% CI [−0.13, 0.21], $z* = 0.44$, $p = .661$. On the contrary, a statistically significant difference was found for the file-rated aggression variable between women (Predicted $R^2 = 0.02$, $n = 144$) and men (Predicted $R^2 = 0.19$, $n = 83$), $\Delta = −0.18$, 95% CI [−0.32, −0.04], $z* = 2.52$, $p = .012$.

Table 1

Bivariate Spearman Correlations for the PID-5-FBF Facets with Self-Reported and File-Rated Physical Aggression (N = 285).

	Females				Males				Total			
	Self-reported ($n = 174$)		File-rated ($n = 144$)		Self-reported ($n = 109$)		File-rated ($n = 83$)		Self-reported ($n = 283$)		File-rated ($n = 227$)	
Variables	r_s	p	r_s	p	r_s	p	r_s	p	r_s	p	r_s	p
Aggression												
Self-reported	–	–	**0.45**	<0.001	–	–	**0.46**	<0.001	–	–	**0.46**	<0.001
File-rated	–	–	–	–	–	–	–	–	–	–	–	–
PID-5-FBF facets												
Anhedonia	0.00	0.992	0.06	0.475	0.19	0.052	−0.05	0.672	0.08	0.203	0.05	0.462
Anxiousness	0.04	0.565	0.01	0.865	0.04	0.653	0.02	0.840	0.03	0.567	0.02	0.786
Attention-Seeking	**0.24**	0.002	0.05	0.585	**0.30**	0.002	**0.32**	0.003	**0.26**	<0.001	0.14	0.033
Callousness	**0.43**	<0.001	**0.27**	<0.001	**0.36**	<0.001	**0.44**	<0.001	**0.40**	<0.001	**0.36**	<0.001
Cog. and Perc. Dys.	**0.26**	<0.001	0.06	0.515	**0.25**	0.008	0.10	0.380	**0.26**	<0.001	0.09	0.189
Deceitfulness	**0.34**	<0.001	0.05	0.539	**0.28**	0.003	0.21	0.060	**0.33**	<0.001	0.12	0.065
Depressivity	0.07	0.370	0.09	0.297	0.12	0.204	−0.13	0.250	0.10	0.106	0.03	0.695
Distractibility	0.19	0.013	0.06	0.472	0.17	0.083	0.08	0.463	**0.18**	0.003	0.06	0.397
Eccentricity	**0.30**	<0.001	0.11	0.193	**0.26**	0.007	0.06	0.594	**0.28**	<0.001	0.11	0.106
Emotional Lability	0.18	0.019	0.15	0.070	0.24	0.011	0.20	0.075	**0.19**	0.001	0.14	0.041
Grandiosity	**0.26**	<0.001	0.01	0.934	**0.34**	<0.001	0.21	0.055	**0.29**	<0.001	0.13	0.060
Hostility	**0.51**	<0.001	**0.34**	<0.001	**0.52**	<0.001	**0.35**	0.001	**0.51**	<0.001	**0.34**	<0.001
Impulsivity	**0.50**	<0.001	**0.25**	0.003	**0.37**	<0.001	**0.33**	0.002	**0.45**	<0.001	**0.28**	<0.001
Intimacy Avoidance	0.08	0.327	0.11	0.184	0.06	0.561	−0.03	0.816	0.08	0.160	0.07	0.275
Irresponsibility	**0.36**	<0.001	0.02	0.829	**0.32**	<0.001	0.20	0.077	**0.35**	<0.001	0.08	0.208
Manipulativeness	**0.32**	<0.001	0.14	0.102	**0.31**	0.001	**0.29**	0.007	**0.32**	<0.001	**0.21**	0.002
Perseveration	**0.27**	<0.001	0.00	0.986	0.16	0.092	0.04	0.720	**0.23**	<0.001	0.02	0.810
Restricted Affectivity	**0.21**	0.006	0.08	0.367	0.15	0.110	0.13	0.249	**0.19**	0.001	0.12	0.070
Rigid Perfectionism	−0.03	0.694	0.02	0.776	0.21	0.028	0.17	0.130	0.05	0.393	0.04	0.547
Risk Taking	**0.45**	<0.001	0.21	0.011	**0.50**	<0.001	**0.45**	<0.001	**0.47**	<0.001	**0.31**	<0.001
Separation Insecurity	0.09	0.233	−0.10	0.229	0.11	0.245	0.08	0.454	0.09	0.123	−0.04	0.589
Submissiveness	−0.12	0.129	−0.12	0.140	−0.02	0.880	−0.22	0.043	−0.09	0.133	**−0.17**	0.009
Suspiciousness	**0.31**	<0.001	0.09	0.290	**0.45**	<0.001	**0.29**	0.007	**0.36**	<0.001	**0.18**	0.006
Unusual B. and Exp.	**0.29**	<0.001	0.10	0.230	**0.41**	<0.001	0.25	0.025	**0.34**	<0.001	0.17	0.011
Withdrawal	0.07	0.372	0.04	0.602	**0.25**	0.008	0.22	0.042	0.14	0.020	0.13	0.048

Note. Statistically significant Spearman correlations ($p < .01$) are in **bold**. The global sample ($N = 285$) comprises all participants who were included at least for one of the analyses. For all variables, higher scores mean higher pathology/aggression. Self-reported aggression: Physical Aggression subscale of the Short-Form Buss-Perry Aggression Questionnaire. PID-5-FBF = Personality Inventory for *DSM-5* Faceted Brief Form; Cog. and Perc. Dys. = Cognitive and Perceptual Dysregulation; Unusual B. and Exp. = Unusual Beliefs and Experiences.

Table 2

Multiple Regression Analysis of PID-5-FBF Facets in the Statistical Prediction of Self-Reported and File-Rated Physical Aggression and Analysis of the Moderating Effect of Biological Sex (N = 285).

	Self-reported ($n = 283$)					File-rated ($n = 227$)				
			Moderated by biol. sex[a]					Moderated by biol. sex[a]		
Predictors	β	p	F	p	ΔR^2	β	p	F	p	ΔR^2
Attention-Seeking	0.01	0.883	0.44	0.506	0.001	−0.02	0.829	2.54	0.112	0.009
Callousness	**0.11**	0.040	**5.40**	0.021	0.011	**0.22**	0.003	1.15	0.285	0.004
Hostility	**0.36**	<0.001	0.28	0.594	0.001	**0.17**	0.026	0.13	0.722	0.001
Impulsivity	0.07	0.261	3.74	0.054	0.008	0.03	0.724	0.91	0.342	0.003
Manipulativeness	0.02	0.771	1.45	0.229	0.003	0.01	0.869	1.46	0.228	0.005
Risk Taking	**0.25**	<0.001	0.13	0.722	0.000	**0.17**	0.026	**7.52**	0.007	0.026
Submissiveness	**−0.17**	<0.001	1.76	0.186	0.004	**−0.16**	0.013	0.92	0.339	0.003
Suspiciousness	0.10	0.059	0.79	0.374	0.002	−0.04	0.548	1.44	0.231	0.005
R^2	0.44					0.21				
Predicted R^2	0.39					0.14				

Note. Statistically significant predictors and moderators ($p < .05$) are in **bold**. Only the facets with a statistically significant correlation with the file-rated variable were entered into the analyses (see Table 1). Dependent variables: self-reported aggression (Physical Aggression subscale of the Short-Form Buss-Perry Aggression Questionnaire); file-rated aggression. PID-5-FBF = Personality Inventory for *DSM-5* Faceted Brief Form; biol. Sex = biological sex.

[a] Displays the results for the test of highest order unconditional interaction (trait*sex), which was conducted separately for each trait predictor with the other traits entered as covariates.

4. Discussion

This is the first multimethod study pertaining to the associations between the PID-5 facets and two operationalizations of physical aggression, to the best of our knowledge. The objectives were to: (a) replicate previously identified associations between the PID-5 and self-reported aggression; (b) compare those associations with self-reported and file-rated aggression; (c) compare those associations between women and men; and (d) identify the relative importance of trait predictors using dominance analysis.

4.1. Main findings

As predicted, Hostility and Risk Taking were significant predictors of self-reported aggression (in line with Dunne et al. [17]). In addition, Callousness emerged as significant (in line with Somma et al. [19]), and

Table 3

General Dominance Weights of PID-5-FBF Facets in the Statistical Prediction of Self-Reported and File-Rated Physical Aggression (N = 285).

Biol. sex	Facet	Self-Reported Aggression				File-Rated Aggression			
		General dominance weight (contribution average)	R^2 proportion (weight/R^2)	R^2 | Pred. R^2	n	General dominance weight (contribution average)	R^2 proportion (weight/R^2)	R^2 | Pred. R^2	n
Females	Attention-Seeking	0.014	0.03	0.46 | 0.40	174	0.002	0.01	0.14 | 0.02	144
	Callousness	0.085	0.18			0.037	0.26		
	Hostility	**0.130**	**0.28**			**0.056**	**0.40**		
	Impulsivity	0.085	0.18			0.020	0.14		
	Manipulativeness	0.024	0.05			0.003	0.02		
	Risk Taking	0.061	0.13			0.006	0.04		
	Submissiv. (neg.)	0.045	0.10			0.013	0.09		
	Suspiciousness	0.021	0.05			0.004	0.03		
Males	Attention-Seeking	0.016	0.03	0.48 | 0.36	109	0.028	0.08	0.35 | 0.19	83
	Callousness	0.031	0.06			.076[a]	0.22		
	Hostility	**0.155**	**0.32**			0.026	0.07		
	Impulsivity	0.029	0.06			0.025	0.07		
	Manipulativeness	0.015	0.03			0.021	0.06		
	Risk Taking	0.130	0.27			**0.108**	**0.31**		
	Submissiv. (neg.)	0.005	0.01			0.048	0.14		
	Suspiciousness	0.099	0.21			0.017	0.05		
Total	Attention-Seeking	0.014	0.03	0.44 | 0.39	283	0.003	0.01	0.21 | 0.14	227
	Callousness	0.051	0.12			**0.060**	**0.29**		
	Hostility	**0.143**	**0.33**			0.041	0.20		
	Impulsivity	0.058	0.13			0.019	0.09		
	Manipulativeness	0.020	0.05			0.009	0.04		
	Risk Taking	0.080	0.18			0.037	0.18		
	Submissiv. (neg.)	0.026	0.06			0.030	0.15		
	Suspiciousness	0.044	0.10			0.007	0.03		

Note. The most important predictor for each subset is in **bold**. Dependent variables: self-reported aggression (Physical Aggression subscale of the Short-Form Buss-Perry Aggression Questionnaire); file-rated aggression. PID-5-FBF = Personality Inventory for *DSM-5* Faceted Brief Form; Biol. sex = biological sex; Submissiv. = Submissiveness; neg. = negative regression weight; Pred. R^2 = Predicted R^2.

[a] Logarithmically transformed to reduce regression residuals and improve model fit. The transformation was kept only for this model since it made no difference in other models, likely because of the higher sample sizes.

Submissiveness (negative predictor) as well. Those results provide strong evidence of replication of, and even expand, previous findings.

Pertaining to the multimethod replication, results were very consistent. In regression analyses, the four facets mentioned above (Hostility, Risk Taking, Callousness, and Submissiveness) also emerged as predictors in file-rated analyses, providing strong multimethod consistency (in terms of statistical significance). Furthermore, facet predictors accounted for considerably more variance in the statistical prediction of self-reported (Predicted R^2 = 39%) than of file-rated aggression (Predicted R^2 = 14%). Among women, PID-5 facets very weakly predicted file-rated aggression (as shown by a Predicted R^2 of 2%), in comparison with self-reported aggression (40%). Of note, women and men had similar self-reported aggression scores, but women had lower scores on the file-rated measure.

Finally, this study is the first to identify the relative importance of predictors using dominance analysis in the AMPD-aggression literature, to the best of our knowledge. The hypothesis that Hostility, Risk Taking, and Callousness would be the most important predictors was mostly supported, in line with Dunne and colleagues' [23] results.

4.2. Multimethod assessment in aggression and personality literatures

First, the present results depart from Lewis and colleagues' [13] findings, who found a nonsignificant association (r_s = 0.18) between self-reported and file-rated aggression in a small sample. However, their operationalization of the latter variable differed in many ways from ours (e.g., their definition of aggression was not restricted to the physical component). In another multimethod aggression study, a strong association was reported between self-reported and clinician-rated aggression ($r_s \approx 0.60$ [12]), while both were only weakly related to official records. Of note, acquaintanceship with the patient was found to be a significant, large moderator of construct overlap in a meta-analytic review examining the self-informant correspondence in FFM research [9]. In the present study, files were rated by external raters. As a result,

acquaintanceship with the patient was very low, maybe resulting in a greater focus on more distal sources by raters (e.g., criminal records). Accordingly, since the correlations between both methods were moderate-high (r_s = 0.45–0.46) in this study, since the file-rated variable often included a review of the criminal record, and since the scoring required an examiner not knowledgeable of the patient, the file-rated variable might represent a hybrid between an informant report and an official record. What appears clear, though, is that self-reported and file-rated aggression only roughly measure the same construct and consequently cannot be used interchangeably.

The same conclusion was drawn for psychopathy research, where it was found that informant-assessed and self-reported psychopathy only shared a modest amount of variance (13%–36% [39]), a result similar to ours (20–21% was shared between self-reported and file-rated aggression). In personality research, the aforementioned meta-analytic review comparing self-assessed vs. informant-assessed FFM traits provided evidence of moderate-high to high convergence (corrected r = 0.46–0.62 [9]), a result somewhat comparable to ours, if not slightly more favorable. Nevertheless, the present results are consistent with the fact that different methods usually capture simultaneously shared and distinct information that is not simply attributable to measurement error ([6,11]). Therefore, a monomethod assessment seems to provide an "incomplete picture" ([39], p. 746). This suggests that researchers should emphasize multimethod replication and that clinicians should contrast different sources of information while conducting an assessment (e.g., assessment reports, self-reports, clinical observations, etc.) to alleviate potential biases.

4.3. Discriminant validity of the PID-5

The results of this study can also be analyzed in the context of the potential discriminant validity issue of the PID-5, including for the prediction of aggression [23]. To explain that problem, some have suggested that the PID-5 might measure simultaneously personality

dysfunction and normal personality traits [40]. On the one hand, without invalidating the latter hypothesis, the present study also points to the fact that discriminant validity might be improved with a multi-method design (e.g., fewer correlations were found for file-rated aggression). On the other hand, it also shows that the overlap (e.g., in terms of explained variance) seems to decrease with the use of different types of measures, which lends some support to the idea that mono-method studies might generate exaggeratedly optimistic validity estimates (as suggested by Zimmermann et al. [5]).

4.4. Women-men discrepancies: facet predictors

The hypothesis that PID-5 predictors would vary between women and men received conflicting support. In contrast with what was initially predicted, the women-men discrepancies were not most obvious in their associations to aggression, as aforementioned, but rather in their amount of explained variance. Overall, Hostility and Callousness were very consistently associated to aggression. The main exception seems to be the explanation of file-rated aggression among men, which seems to be mainly driven by Risk Taking. However, moderation analyses revealed some additional nuances, which were further substantiated when inspecting the general dominance weights. In the prediction of self-reported aggression, Callousness was significant among women only and it had a higher dominance weight (8.5%) than for men (3.1%). Among male offenders, Callousness was also not significant in regression analyses [17], even if it shared common variance with aggression [23]. Callousness might have an indirect impact among men (e.g., by inter-acting with Hostility and/or Risk Taking), a hypothesis that should be examined in future studies. On the contrary, Risk Taking seems to make a much more substantial contribution among men. In the prediction of file-rated aggression, Risk Taking was significant among men only. The general dominance weight was also much higher among men (10.8%), while it made virtually no contribution among women (0.6%). Risk Taking was the most important facet in the statistical prediction of file-rated aggression among men, as well as the second most important facet of self-reported aggression. Observers might have considered heuristically that "global recklessness" was more indicative of violence among men. Perhaps Risk Taking leads to "observable" behaviors that are indicative of general antisociality (e.g., reckless driving, aggression), which are then easy to record (e.g., in reports).

The differential associations between men and women were also discussed by Munro and Sellbom [21] in the context of IPV, who suggested that the higher externalizing propensity of men and higher internalizing propensity of women could logically be reflected in the AMPD-IPV (and therefore AMPD-aggression) associations; Risk Taking might be a facet that contributes to that higher externalization propensity. In addition, Risk Taking shares significant content coverage with some facets of the FFM Conscientiousness domain (which notably relate to a lack of capability to anticipate consequences) that were found to be strong and consistent predictors of aggression and antisocial behavior in a meta-analytic review [22].

4.5. Women-men discrepancies: methodological considerations

Among men, the amount of explained variance by facets was slightly reduced when aggression was assessed by file review, to a degree that might simply reflect multimethod assessment. Among women, in comparison, a neat multimethod disparity was found depending on how aggression was assessed. First, it might be that female-perpetrated aggression is as frequent but less severe than male-perpetrated aggression (such hypothesis was previously suggested [20,24]). The current file-rated assessment procedure might have overly focused on serious behavioral acts of aggression (e.g., physical acts that caused injuries, that led to hospitalization, convicted offenses), while the patient might have focused on a more general tendency toward aggression, including less severe forms (e.g., slapping) that might have been overlooked and/

or underreported during the clinical evaluation. Aggressive behaviors might elicit shame in some patients who may have concealed them during the face-to-face clinical interview (and were therefore less "accessible" by an examiner through file review), but were less reluctant to disclose them during the computer-based self-report assessment.

Second, it may also reflect implicit biases in the clinicians who conducted the initial assessment with the patient, in the evaluators who reviewed the files, or even in the justice system itself (e.g., an implicit propensity to assess woman-perpetrated aggression less thoroughly, to report it less systematically in a clinical file, or to rate it with a lower score). For instance, in the Province of Quebec, where the study was conducted, 78.8% of alleged perpetrators of recorded offenses against the person in a conjugal context are men [41], while paradoxically in the same province 3% of women and 3.5% of men report physical or sexual victimization in a conjugal context; however, women report a higher degree of severity (e.g., being victims of injuries, threatened with a weapon, etc.; [42]). This phenomenon is sometimes referred to as the "Sex-Symmetry Theory" of IPV. Similarly, it has been suggested that, among women, events pertaining to aggressive (or other antisocial) behaviors are only rarely recorded or prosecuted, in comparison to men [26], which was perhaps reflected in the records clinicians had access to when writing their reports. Those elements are consistent with the hypothesis that, in this study, male-perpetrated aggression might have been more "noticeable" and thus more likely to be recorded in clinical files, perhaps explaining why men received higher scores through file review (but not through self-report). Finally, from a clinical standpoint, a complementary or alternative hypothesis is that women with PD may have a representation of themselves as "all-bad", violent, out-of-control perpetrators, that is not fully grounded in reality (e.g., akin to Gregory's [43] "guilty" or "demigod perpetrator" self-representations). This "bad" representation might be fueled by guilt-inducing social expectations toward women (e.g., social roles might discourage aggression even more among women than men). It could explain why women self-rated themselves as high as men even in the eventuality that their aggressive behaviors were indeed less severe.

4.6. Limitations and strengths

First, the cross-sectional design of this study precludes any strong causal or predictive inference. Even if ad hoc indices might be invaluable to clinicians (to assess present risk), a longitudinal design would be necessary to assess the long-term predictive validity of the PID-5 on aggression. Second, even if analyses merging both men and women had an appreciable sample size, analyses by biological sex had smaller sizes (especially for men), which might have resulted in more vulnerability to sampling variance and less power to detect moderation effects. Third, while raters were blind to BPAQ-SF and PID-5-FBF scores for all patients, they were not blind to biological sex, which could have led to implicit biases, as aforementioned. Fourth, the important number of analyses performed (e.g., correlations, moderation analyses) might have inflated Type I error. Even if the main findings were cross-validated with two methods (e.g., predictors of aggression) and, in many cases, two sets of analyses (i.e., moderation and dominance analyses), we cannot completely exclude that, for instance, some correlations were simply artifacts. Finally, the external validity of findings is strong for at least three reasons: (a) the use of a clinical sample in itself (and of patients with PD, all the more) improves significantly the scope of conclusions; (b) the sample was recruited in a naturalistic setting with few exclusion criteria; and (c) the use of a multimethod design allowed cross-validation, improving the robustness of results.

4.7. Main conclusions and clinical implications

The most important, innovative, and clinically relevant findings of this study are that: (a) when the predicted variable (i.e., aggression) and the predictors (i.e., traits) are assessed through different methods, the

amount of explained variance tends to shrink (in line with, e.g., Meyer et al. [6]); (b) clinicians might have to attribute a different importance to facet predictors depending on the sex of the patient (in line with Dowgwillo et al. [20]; Munro & Sellbom [21]; e.g., Risk Taking seems more important among men); and (c) a facet-level analysis of the PID-5 seems very important to optimize aggression assessment, since facet predictors seem more consistent across the literature [17,19] than domain predictors [44], and since FFM research suggested that facets had a better predictive ability than domains [22].

From a criminological standpoint, it is well known that criminal records (which might be, in part, approximated by the file-rated variable) often represent only the "tip of the iceberg" ([12], p. 9). Accordingly, some experts have already put forth that "[a] far more representative estimate can be drawn from *patterns* [emphasis put in the original text], which are recurring aspects of behaviour that are far more likely to reflect what needs to change." ([45], p. 10). Thus, self-reported aggression might provide a more accurate picture of the overall pattern of aggression (i.e., more sensitive), while file-rated aggression might be more focused on severe behavioral acts (i.e., more specific). In practice, since every method provides only a partial representation of a construct [6], both operationalizations might be incrementally useful to clinicians in assessing risk by providing distinct nuances (e.g., pertaining to the severity and frequency of the acts), supporting their combined use. Nevertheless, more research is necessary to parse out their unique and common contributions.

Relatedly, since personality traits should theoretically explain behavioral patterns (at least to some degree), this suggests that using the PID-5 as a broadband measure to assess aggression might be indicated in an outpatient clinic, where standard risk instruments (e.g., HCV-20^{V3}) cannot always be used systematically for a number of reasons (e.g., lack of proper clinician training, lack of time, administrative constraints, unavailability of historical risk factors information, etc.; see [14]). A cautious point of view would be that, since it received more consistent multimethod support, using the PID-5 is more indicated among men, especially if the clinical objectives are to assess more serious acts of aggression. However, an alternative point of view might be that, since female-perpetrated aggression might otherwise "slip under the radar", using the PID-5 would be particularly indicated, because clinical risk might be underestimated through file reading only, and lead to a rough estimation of clinical change (e.g., a female patient might have few formal aggressive/violent offenses in her criminal record, but nevertheless be assaultive in her day-to-day life). This latter hypothesis would be consistent with the conclusion that mental health professionals often have a limited ability to assess future violence risk in female psychiatric patients, often resulting in an underestimated prediction [46].

4.8. Future directions

To facilitate knowledge translation into clinical heuristics, Dunne and colleagues [43] suggested that the development of an interpretive guide for the PID-5 should be a high priority. Specifically, they suggested that "code types" (e.g., H—C for Hostility-Callousness) akin to those of the Minnesota Multiphasic Personality Inventory (MMPI) series could be a promising avenue. Even if they represent widespread coding strategies among practitioners, there is a high degree of heterogeneity in how scales are combined and how they relate to the predicted outcomes (e.g., [47]), so the value of eventual PID-5 code types should be empirically evaluated and possible interactions (e.g., Hostility*-Callousness) should be investigated (e.g., by aggregating data in a meta-analysis). Another option that could be empirically tested could be to build a weighted chart that assigns "risk points" to each key facet based on their elevation (e.g., a cut-off where Hostility becomes a particularly significant risk factor for the perpetration of aggression). Then, raters could sum up the points from those facets (e.g., Hostility, Risk Taking, Callousness) to get a cumulative risk level. This raw score could then be transformed to yield a probability (e.g., low, medium, or high risk)

somewhat similar to that of many violence risk instruments. In addition, the present study underscores that such a guide might have to consider nuances pertaining to biological sex.

Also, longitudinal studies with many testing points could establish a more robust causal sequence. A multimethod study that compares trait-aggression associations by using other operationalizations of aggression (e.g., official records of violent offenses or convictions) or the informant version of the PID-5 [48] could also be relevant to expand findings (e.g., by testing if a combination of the self-reported and informant-reported traits result in an improved prediction of aggression). Finally, it would be important to clarify to what extent facets can serve as malleable transdiagnostic treatment indicators. To date, even if a meta-analysis has revealed that traits do improve through treatment for a number of psychiatric disorders—PDs being among the two conditions with the highest amount of change (with anxiety disorders [49])—data pertaining to the PID-5 are, except for a few commendable exceptions [50], sorely lacking. Testing existing psychotherapy or psychoeducation protocols (e.g., anger management) and measuring their efficacy (e.g., in terms of "Hostility reduction") would be highly relevant. Bridging the gap between dimensional personality assessment and treatment is a challenge that the AMPD literature has to address more generally [3].

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Data statement

This study was not preregistered. The sample was also used in other studies from the same author group, but the objectives and analyses presented here are original. The data cannot be made publicly available because of ethical/privacy restrictions, but could be provided upon reasonable request on an individual basis from the corresponding author.

Declaration of Competing Interest

None.

Acknowledgments

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.comppsych.2022.152316.

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