Journal of Personality Disorders, 33, 2019, 424

PERSONALITY PATHOLOGY PROFILES AS MODERATORS OF THE GROWING PRO-SOCIAL PROGRAM: OUTCOMES ON COGNITIVE, EMOTION, AND BEHAVIOR REGULATION IN MALE PRISON INMATES

Nélio Brazão, PhD, Daniel Rijo, PhD, Diana Ribeiro da Silva, MSc, Maria do Céu Salvador, PhD, and José Pinto-Gouveia, PhD

This study consisted of secondary data analysis of information collected from inmates who had participated in an earlier independent randomized controlled trial testing the effects of the Growing Pro-Social (GPS) program. The current study assessed personality disorders as moderators of the GPS effects in cognitive malfunctioning, emotion regulation strategies, and prison misconduct in male prison inmates. Participants were 254 inmates randomly assigned to either the GPS (n = 121) or the control group (n = 133). Participants completed self-report measures at four time points, and were interviewed with the SCID-II at baseline. Prison misconduct information was collected from prison records. Latent profile analysis identified four different personality pathology profiles. Mixed ANOVAs showed non-significant time × condition × personality pathology profiles effects, indicating that change on the outcome measures was not affected by personality pathology. Findings suggested that severely disturbed inmates could benefit from the GPS program, which stresses the need to provide appropriate treatment to offenders.

Keywords: Growing Pro-social program, male prison inmates, personality disorders, treatment moderators

The prevalence rates of personality disorders among male prison inmates are high, reaching up to 80% (Brazão, da Motta, Rijo, & Pinto-Gouveia, 2015). As expected, the most prevalent DSM diagnosis among prison inmates is antisocial personality disorder (ASPD), with prevalence rates between 46 and 84% (e.g., Fazel & Danesh, 2002; Kjelsberg et al., 2006). The association between ASPD and violent offenses is widely known and reported in several studies (Duggan & Howard, 2009; Gilbert & Daffern, 2011; Roberts & Coid, 2010; Short, Lennox,

From Center for Research in Neuropsychology and Cognitive-Behavioral Intervention, Faculty of Psychology and Education Sciences, University of Coimbra, Coimbra, Portugal.

Address correspondence to Nélio Brazão, Centro de Investigação em Neuropsicologia e Intervenção Cognitivo-Comportamental (CINEICC) da Faculdade de Psicologia e de Ciências da Educação da Universidade de Coimbra, Rua do Colégio Novo, 3001-802 Coimbra, Portugal. E-mail: nelio-brazao@hotmail.com

Stevenson, Senior, & Shaw, 2012; Warren & South, 2009; Yu, Geddes, & Fazel, 2012). Research with clinical and forensic samples has found that ASPD is a significant predictor of violent behavior (e.g., Thornton, Graham-Kevan, & Archer, 2010). In a study by Gandhi and colleagues (2001), participants with ASPD presented more violent and criminal behavior after discharge from a psychiatric hospital. Longitudinal research also suggests that ASPD is a substantial risk factor for criminal recidivism among adult offenders in the criminal justice system (Hiscoke, Långström, Ottosson, & Grann, 2003; Warren et al., 2002).

Another related and relevant issue is that the incarcerated population presents complex problems and high rates of psychiatric comorbidity. Teplin (1994) found that, although 50% of 728 male inmates were diagnosed with ASPD, 30% still presented severe mental disorders in addition to ASPD. Hiscoke and colleagues (2003) observed a similar tendency, with 43% of 168 inmates fulfilling criteria for another Cluster B personality disorder. Multiple diagnoses were the rule rather than the exception: 74% of participants were diagnosed with more than one personality disorder, with participants meeting criteria for at least two personality disorders.

Although personality pathology assessment procedures within forensic settings are emphasized in different clinical recommendations and checklists (Kropp, Hart, Webster, & Eaves, 1995; Tardiff, 2001; Webster, Douglas, Eaves, & Hart, 1997), it is still unclear to what extent personality disorders are acknowledged and recognized by prison health care services. Consequently, the opportunity to treat and rehabilitate personality-disordered inmates is often lost as a consequence of the lack of effective screening procedures or failure to provide an adequate intervention to the inmates' mental health problems (Brazão et al., 2015).

Most research has identified criminal recidivism reduction as the primary outcome of the efficacy of rehabilitation programs. Although the positive effects of the intervention programs over recidivism rates have usually been presented as a major requirement for the selection of effective intervention practices (e.g., McGuire, 2011, 2013), less is known about the change in other variables that research has also found to be associated with re-offending (Antonio & Crossett, 2017; Skeem, Polaschek, & Manchak, 2009), namely personality disorders (Gilbert & Daffern, 2011). A new trend in research has begun to identify and to assess other relevant variables as treatment outcome measures, namely cognitive and emotional correlates of antisocial behavior (Clarke, Cullen, Walwyn, & Fahy, 2010; Cullen et al., 2012; Emilsson et al., 2011; Redondo, Martínez-Catena, & Andrés-Pueyo, 2012).

In line with this new wave of research, a randomized controlled trial (RCT) was conducted in Portuguese prisons aiming to assess the efficacy of a new cognitive-behavioral group program with adult offenders, the Growing Pro-Social (GPS; Rijo et al., 2007) program. The GPS is a structured and manualized group program grounded in schema theory and intervention methods (e.g., Rafaeli, Bernstein, & Young, 2011; Young, Klosko, & Weishaar, 2003), designed to target offenders' maladaptive behavioral patterns, disruptive emotions, and cognitive malfunctioning (cognitive distortions and early maladaptive schemas). Specifically, it aims to promote emotion and behavior regulation by changing the dysfunctional cognitive correlates of antisocial

behavior (for a detailed description of the program, see the Interventions section). Even though the GPS was not specifically designed in accordance with the Risk-Need-Responsivity model (RNR; Andrews & Bonta, 2010), the program's theoretical approach (i.e., schema theory) presents some similarities with the RNR approach to the rehabilitation of offenders. Schema therapy aims to change offenders' cognitive malfunctioning, which, in agreement with the RNR need principle, can be conceptualized as a criminogenic need and should be identified as a target of change in rehabilitation programs (Andrews & Bonta, 2010). Moreover, schema therapy resorts to cognitive-behavioral techniques that, as argued by the RNR responsivity need, are the more effective strategies when intervening with offenders (Andrews & Bonta, 2010).

As previously specified, the GPS was designed to promote cognitive change, especially in schemas' prominence. It is important to add that early maladaptive schemas have been found to be associated with the origins and maintenance of personality disorders (Carr & Francis, 2010; Lobbestael & Arntz, 2010), and schema therapy was developed for patients with personality pathology, considering their poor response to standard cognitive therapy interventions (Beck, Davis, & Freeman, 2015; Rafaeli et al., 2011; Young et al., 2003). It is noteworthy that GPS aims to promote emotion and behavior regulation through change in the offenders' cognitive malfunctioning, which emphasizes the program's adequacy for inmates with personality pathology. Taking into consideration that personality disorders are characterized by significant levels of cognitive, emotion, and behavior dysregulation (American Psychiatric Association [APA], 2013), the GPS can be seen as an adequate treatment for personality-disordered inmates.

The RCT on the GPS showed that the program was effective in reducing the frequency of self-reported cognitive distortions and the prominence of early maladaptive schemas, as well as anger, shame, and paranoia (Brazão, Rijo, Salvador, & Pinto-Gouveia, 2017, 2018a). The GPS has also proven to be effective in reducing emotion regulation difficulties and disciplinary infractions inside prison (Brazão et al., 2018b). Nonetheless, these studies did not assess treatment moderators. As noted by different authors (e.g., Mascha, Dalton, Kurz, & Saager, 2013; Moldovan & Pintea, 2015), clinical research is about more than establishing that an effect exists. It is just as important to identify treatment moderators (Hayes & Rockwood, 2017). Treatment moderators clarify for whom and under what conditions the treatment works. They can be helpful, for instance, in choosing inclusion and exclusion criteria and identifying which patients might be more or less responsive to the delivered treatment. Information on moderators can thus guide differential treatment selection and planning (Manders, Dekovié, Asscher, van der Lan, & Prins, 2013).

Despite extensive research on the prevalence of personality disorders in prison inmates and empirical data suggesting that individuals with severe personality pathology are less responsive to treatment (Beck et al., 2015; Levenson, Wallace, Fournier, Rucci, & Frank, 2012; Moran & Crawford, 2013; Rafaeli et al., 2011) and are more likely to re-offend (Kennealy, Skeem, Walters, & Camp, 2010; Walters & Heilbrun, 2010; Walters, Knight, Grann, & Dahle, 2008), there is a lack of studies/RCTs testing the severity of personality disorders as moderators of treatment effectiveness in offenders. The current study

intended to fill this gap and consisted of a secondary data analysis of information collected from inmates who had participated in an independent RCT on the efficacy of the GPS program. This study added to the previous research by examining the role of personality disorders as moderators of the GPS effects in cognitive malfunctioning (cognitive distortions and early maladaptive schemas), emotion regulation strategies (expressive suppression and cognitive reappraisal), and prison misconduct (number of disciplinary infractions and number of days in punishment) over time in male prison inmates. Following previous empirical data (Beck et al., 2015; Levenson et al., 2012; Moran & Crawford, 2013; Rafaeli et al., 2011), inmates with severe personality pathology were expected to be less responsive to the GPS treatment and, consequently, would present lower improvements on cognitive, emotion, and behavior regulation, when compared with inmates with mild and/or moderate personality pathology. Additionally, controls with severe personality pathology were expected to present a worsening on cognitive, emotion, and behavior regulation over time, when compared with controls with mild and/or moderate personality pathology.

METHOD

TRIAL DESIGN AND PARTICIPANTS

Data were collected in the context of a large randomized controlled trial, aimed to assess the GPS efficacy. The study was conducted in nine Portuguese prisons and included 254 male prison inmates between 18 and 40 years of age. The initial selection of participants obeyed the following exclusion criteria: (1) cognitive impairment (because GPS is not suitable for the cognitively impaired); (2) psychotic disorders (the experiential exercises used in the program are contraindicated for psychotic patients); (3) substance dependence (treatment for substance dependence must precede the GPS treatment); (4) being sentenced exclusively for sexual offenses (sex offenders would benefit from more specific intervention programs); and (5) remaining in prison less than 24 months since the beginning of the program (taking into account GPS's 12-month length and the one-year follow-up period). Female offenders were also excluded from the sample because women represent less than 6% of the total inmates in Portugal, and any possible idiosyncrasies from this cohort would be underrepresented.

Sample Size. A power analysis was conducted with the G*Power v3.1 software (Faul, Erdfelder, Buchner, & Lang, 2009) before the RCT onset, and mixed ANOVA was used as the data analytic strategy. Results showed that a sample of 203 inmates was necessary to detect medium effects with a significance level of .05 and a power of .90.

INTERVENTIONS

The GPS is a manualized program consisting of 40 90-minute sessions that run on a weekly basis. Sessions must be delivered by two therapists skilled in cognitive-behavioral techniques and schema therapy. The GPS's structure

follows a progressive strategy of change, which begins by: (1) increasing knowledge about the nature and ambiguities of human communication, (2) changing maladaptive behavioral patterns in specific interpersonal contexts, (3) learning about cognitive distortions and counteracting their influence in the attribution of meaning to events, (4) experiencing and understanding the function and meaning of emotions and their influence on human behavior, and (5) learning about early maladaptive schemas and fighting against their influence on thoughts, emotions, and behaviors. This gradual strategy of change requires the program to be delivered in a predefined sequence of five modules (preceded by an initial session for the presentation of the program): (1) human communication, (2) interpersonal relationships, (3) cognitive distortions, (4) meaning and function of emotions, and (5) early maladaptive schemas (see Table 1). The GPS ends with a final session, and follow-up sessions can be carried out afterwards.

In Module 1, participants learn about the communication processes, are challenged to identify their obstacles (e.g., the incongruences between verbal and nonverbal language), and to cope with those same obstacles in a healthy and prosocial way. In Module 2, participants are guided to discover the advantages of assertiveness over aggressiveness, and they are challenged to behave assertively in specific interpersonal contexts (e.g., saying no, asking for help, apologizing) and to use negotiation skills to cope with interpersonal

TABLE 1. GPS Modules and Contents

Modules	Number of sessions	Contents summary
Initial session	1	Presentation of the participants, the structure, and the methodology of the program.
Human communication	5	The communication process and its obstacles; verbal and nonverbal communication skills; the ambiguity of human communication; the (in) congruences between digital and analogical languages.
Interpersonal relationships	10	Behavioral styles (assertive, aggressive, passive, and manipulative) in relationships; self-concept and interpersonal behavior; ideas about the others and interpersonal behavior; specific interpersonal contexts and assertive behavior; negotiation as a strategy to deal with conflicts.
Cognitive distortions	6	Understanding cognitive distortions (thinking errors); identifying and changing cognitive distortions: Selective Abstraction, Overgeneralization, Mind Reading, Crystal Ball, Minimization, Disqualifying the Positive Experiences, Dichotomous Thinking, Labeling, and Personalization.
Function and meaning of emotions	7	The diversity of the emotional experience; the nature and function of emotions: sadness, shame, fear, anger, guilt, and happiness.
Early maladaptive schemas	10	The role of core schemas about the self and others; core schemas and their influence in giving meaning to reality; identifying and changing core schemas: Failure, Social Isolation/Alienation, Mistrust/Abuse, Defectiveness/Shame, Emotional Deprivation, Abandonment/Instability, Grandiosity/Entitlement; fighting core schemas' influences in thoughts, emotions, and behavior.
Final session	1	Reflection and consolidation of learning, and generalization of gains made during the program.

Note. Adapted from Brazão, N., da Motta, C., & Rijo, D. (2013), From multimodal programs to a new cognitive-interpersonal approach in the rehabilitation of offenders, *Aggression and Violent Behavior*, *18*, 640.

conflicts. In Module 3, participants are encouraged to understand the way our mind processes social information. Cognitive distortions are identified, and participants are trained to think in a more realistic way about relevant daily events. In Module 4, participants are guided to understand the function and meaning of emotions, namely their adaptive value. Participants are also challenged to understand the link between their problems and emotion regulation difficulties. In Module 5, early maladaptive schemas are identified as well as their influence over the attribution of meaning to events and the triggering of disruptive emotions. Participants are encouraged to fight against their own schemas, diminishing the schemas' influence over thoughts, emotions, and behavior.

All sessions include experiential exercises, and participants are encouraged to achieve insight through systematic questioning about the reactions noticed during activities (guided discovery approach), and to apply this knowledge to real life scenarios. Homework assignments between sessions are also included, in which participants are asked to use the strategies learned in everyday life situations in the following week.

The treatment group attended the GPS program for about 12 months, in addition to the treatment as usual (TAU) delivered in Portuguese prisons: supervision of school frequency, occupational and job-related tasks, sentence planning supervision over time, and counseling by a psychologist on a regular basis (once per week). Participants in the control group received TAU and did not attend the GPS program or any other kind of structured intervention during the research period.

MEASURES

Outcome Measures. In order to assess GPS efficacy on cognitive and emotion regulation, participants completed self-report measures of maladaptive/adaptive thinking, early maladaptive schemas, and emotion regulation strategies at four time-points: baseline, mid-treatment (after the 20th session), post-treatment, and follow-up (12 months after GPS completion). Assessors did not serve as therapists (and vice-versa) in the trial, and were blind to condition assignment or personal information about participants.

Angry Cognitions Scale (ACS). The ACS (Martin & Dahlen, 2007; Portuguese version by Leal, 2008) includes 54 items distributed across nine scenarios (e.g., "You are waiting in a long line at the grocery store when another person enters the line in front of you"). Participants are asked to imagine that the situation described in each scenario had just happened to them. They are then presented with six items referring to different thoughts that could arise during the situation that correspond to the five thinking errors or cognitive distortions, namely: (1) Misattributing Causation; (2) Overgeneralization; (3) Inflammatory Labeling; (4) Demandingness; and (5) Catastrophic Evaluation (for a definition of each of these errors, see Martin & Dahlen, 2007). The remaining item in each scenario refers to Adaptive Processes (adaptive thinking). Each item is rated on a five-point Likert-type scale (1 = *very unlikely* to 5 = *very likely*).

The original version of the ACS presented good internal consistency values, with alphas ranging between .82 and .91 for each of the five thinking errors subscales, and an alpha of .79 for the subscale corresponding to Adaptive Processes (Martin & Dahlen, 2007). In a Portuguese study with male prison inmates, only two factors were identified—Maladaptive Processes and Adaptive Processes—with Cronbach's alphas of .93 and .77, respectively (Leal, 2008).

In the current study, the Maladaptive Processes factor presented an alpha of .94. and the Adaptive Processes an alpha of .78.

Young Schema Questionnaire (SQ-S3). The YSQ-S3 (Young, 2005; Portuguese version by Pinto-Gouveia, Rijo, & Salvador, 2006) is a self-report measure with 90 items that assesses the 18 early maladaptive schemas (EMS) proposed by Young (1990). Each EMS is evaluated with a set of five items listed randomly, which the respondent rates using a Likert-type scale from 1 (*completely untrue to me*) to 6 (*describes me perfectly*). The YSQ-S3 has been widely investigated and has shown good psychometric properties (e.g., Rijkeboer, Bergh, & Bout, 2005). In the Portuguese version, a structure of 18 factors with moderate item-total correlations and high internal consistency ($\alpha = .97$) was found (Rijo, 2009, 2017).

In the present study, only the eight EMS proposed as underlying antisocial behavior by the GPS theoretical model (Rijo et al., 2007) were considered. The total score (resulting from the sum of the eight EMS) internal consistency was .89. As for the specific EMS, the internal consistency was .83 for emotional deprivation, .78 for abandonment/instability, .84 for mistrust/abuse, .78 for social isolation/alienation, .76 for defectiveness/shame, .81 for failure, .89 for grandiosity/entitlement, and, finally, .75 for insufficient self-control/self-discipline.

Emotion Regulation Questionnaire (ERQ). The ERQ (Gross & John, 2003; Portuguese version by Dinis & Pinto-Gouveia, 2007) is a 10-item self-report questionnaire that assesses two different emotion regulation strategies: cognitive reappraisal (e.g., "When I'm faced with a stressful situation, I make myself think about it in a way that helps me stay calm") and expressive suppression (e.g., "I control my emotions by not expressing them"). Respondents answer each item on a seven-point scale ranging from 1 (strongly disagree) to 7 (strongly agree). The original version of the ERQ presented good internal consistency values, with alphas of .79 for the cognitive reappraisal subscale and .73 for the expressive suppression subscale (Gross & John, 2003). In the Portuguese version, the Cronbach's alpha was .80 for both cognitive reappraisal and expressive suppression (Dinis & Pinto-Gouveia, 2007). In the current study, internal consistency values were .76 for cognitive reappraisal and .72 for expressive suppression.

Disciplinary Infractions Grid. In order to assess GPS efficacy in reducing disciplinary infractions (observable behavior), researchers developed a grid and collected the following data from prison records: total number of disciplinary infractions (e.g., work-absence, defiant/oppositional behavior, aggressive and

violent behavior, destruction of prison property, alcohol/drug-related offenses) committed by each inmate; and the total number of days each inmate was in punishment. These data were collected for three time intervals: during the 12 months before the beginning of the GPS sessions, during the program's 12-month length, and during the 12 months after treatment completion. The average number of disciplinary infractions and the average number of days in punishment for each time interval were computed and taken as indicators of behavior (dys)regulation.

Moderator Measure. In order to investigate personality disorders as treatment moderators, participants from treatment and control groups were interviewed with the Structured Clinical Interview for DSM-IV Axis II Personality Disorders (SCID-II; First, Gibbon, Spitzer, Williams, & Benjamin, 1997; Portuguese version by Pinto-Gouveia, Matos, Rijo, Castilho, & Salvador, 1999) at baseline.

The SCID-II is a semistructured diagnostic interview that assesses 10 Axis II personality disorders from the *Diagnostic and Statistical Manual of Mental Disorders,* fourth editon (*DSM-IV*; APA, 2000), and the depressive and passive-aggressive personality disorders (included in *DSM-IV*'s appendix). It can be used to diagnose Axis II disorders categorically (present or absent) and dimensionally (according to the number of criteria met for each diagnosis). The SCID-II also provides a summary with a pathology profile of scores over the assessed personality disorders, allowing the interviewer to decide which disorder should be the major focus of clinical attention (main diagnosis).

In the current study, dimensional personality disorder (PD) scores were calculated by summing up the items answered with "present" for each PD, dismissing items that were scored "uncertain" or "absent." Due to time and economic restrictions, PD diagnoses were only assessed by one rater, so interrater reliability could not be tested. In order to minimize possible bias, assessors had experience in the assessment and treatment of personality disorders in antisocial individuals, and received regular supervision during the time SCID-II was administered in prisons.

PROCEDURES

As previously specified, the current study consisted of a secondary data analysis of information collected from inmates who participated in a randomized controlled trial that was designed in accordance with the CONSORT guidelines (Moher et al., 2010) and was registered at clinicaltrials.gov (ID: NCT03013738). The study was also approved by the Ethics Committee of the Faculty of Psychology and Educational Sciences of the University of Coimbra where the Research Center is based. Additionally, researchers sought authorization by the Portuguese Data Protection Authority, in order to assure data protection for all participants involved in the study.

After the approval by the Head of the General Directorate of Reintegration and Prison Services of the Portuguese Ministry of Justice, a large sample of participants was randomly selected using a random number table by a research assistant who was blind to any personal information about the inmates. Then, a meeting between the research team and the randomized inmates took place,

in which researchers explained the goals of the study, presented a brief overview of the treatment program, and invited inmates to participate voluntarily.

Participants who agreed to participate then gave written informed consent, completed the self-report measures and the SCID-II at baseline assessment, and were randomly assigned to treatment conditions (treatment or control groups) using a random number table by a research assistant who was blind to any information about participants. Afterward, the research team informed the psychologists in each prison of the results of the randomization so that the GPS could be initiated. Disciplinary infractions were collected by independent research assistants who were blind to group assignment or any personal information of participants.

GPS facilitators received training and regular supervision by the research team (including the program's main author) during the time GPS was run in the prisons. As a strategy to increase treatment integrity, the GPS sessions were carried out by two therapists (two different therapists for each prison). While one therapist was leading the session, the other one observed the implementation and helped keep it close to the program handbook. The second therapist intervened only if the first one deviated from the protocol. An established codebook for helping this therapist determine what counted as a deviation (e.g., discussing topics not related or irrelevant to the session's goals) was provided in the GPS handbook. Quality control procedures, such as recording sessions and/or the presence of external assessors in the GPS sessions, were not allowed in prisons.

DATA ANALYSIS

Data analyses were carried out in accordance with both the intention-to-treat and per-protocol approaches. Preliminary analyses included comparisons between the treatment and control groups on the prevalence of personality disorders (i.e., frequency of global prevalence, main diagnosis, and number of diagnoses), which were conducted with chi-square statistics (taking into account the nature of the data) using the IBM SPSS Statistics v22.0. Then, Mplus v7.4 was used to conduct latent profile analysis (LPA), in order to identify different personality pathology profiles within the current sample based on: (1) the number of diagnostic criteria met for antisocial personality disorder and (2) the number of personality disorders diagnosed in each participant.

LPA is a variant of latent variable mixture modeling, that is, a person-centered analytic tool that focuses on similarities and differences among people on observed continuous variables (McLachlan & Peel, 2004). The first step on LPA was to determine the number of classes with well-defined differentiated profiles, starting with a one-class model. The number of classes was then increased until there was no further improvement in the model (Lubke & Muthén, 2007). To avoid local likelihood maxima, we increased the sets of random start values to 3,000 and the number of iterations to 100, always checking the replicability of best log likelihood value (Morin, 2016). The adjustment of the models and the decision about model selection were judged in accordance with the guidelines by Ram and Grimm (2009). First, we examined the output of each model estimated and searched for potential problems or inconsistencies.

Second, we compared models with different numbers of classes using information criteria (IC) based-fit statistics, that is, Bayesian information criteria (BIC; Schwartz, 1978), Akaike information criteria (AIC; Akaike, 1987), and sample-size-adjusted BIC (SSA-BIC; Sclove, 1987). Lower values on these fit statistic indices (especially on BIC; Nylund, Asparouhov, & Muthén, 2007) indicate better model fit. Third, we examined entropy values, which assess the accuracy with which models classify individuals into their most likely class. Entropy ranges from 0 to 1, with values superior to .70 indicating clear classification and greater power to predict class membership (Muthén, 2001). Fourth, we tested the statistical significance to determine whether a more complex model (*k* classes) was able to fit the data significantly better than a more parsimonious model (*k*–1 classes), by using the Lo-Mendell-Rubin test (LMR; Lo, Mendell, & Rubin, 2001) and the bootstrap likelihood ratio test (BLRT; McLachlan & Peel, 2004). Non-significant *p* values, both in the LMR and in the BLRT tests, indicate that a model with one fewer class is preferred. Fifth, we considered the sample size of the smallest class; specifically, models with a class < 1% and/or numerically $n < 25$ members should be rejected (Bauer & Curran, 2004). Finally, and taking into account that LPA is a probabilistic approach, we also considered average probabilities of class membership equal to or larger than .80 (Rost, 2006), which indicate a good class solution.

Following the LPA procedure in which four personality pathology profiles were found (see Results section), and in order to investigate personality disorders as moderators of the GPS effects on cognitive, emotion and behavior regulation, mixed ANOVAs with time as the within-group factor, and condition and personality pathology profiles as the between-group factors, were carried out using the IBM SPSS software. Analyses yielding a significant time × condition × personality pathology profiles effect on the outcome measure indicated that personality pathology was a moderator. Effect sizes were computed using partial eta squares (η^2_p), with $\eta^2_p = .01$ referring to a small effect size, .06 to a medium effect size, and .14 to a large effect size (Tabachnick & Fidell, 2013).

RESULTS

RECRUITMENT AND RETENTION

Using CONSORT criteria (Moher et al., 2010), a flow diagram of inmate participation was created (see Figure 1). From the 270 male prison inmates that were invited to participate voluntarily, 16 (5.9%) declined to participate and 254 (94.1%) were randomly assigned to treatment and control groups. Of the 121 inmates randomized to GPS, 69 (57.0%) completed the protocol (i.e., baseline, mid-treatment, post-treatment, and follow-up assessments). Only 17 (14.0%) inmates dropped out the program, and attrition rates were mainly due to transfer to another prison or parole. From the 121 treatment participants, 78 (70.6%) attended more than 32 sessions, 18 (14.8%) attended between 31 and 21 sessions, 12 (9.9%) attended between 20 and 11 sessions, and 8 (4.7%) attended fewer than 10 sessions. A cut-off of ≥ 32 sessions (80%

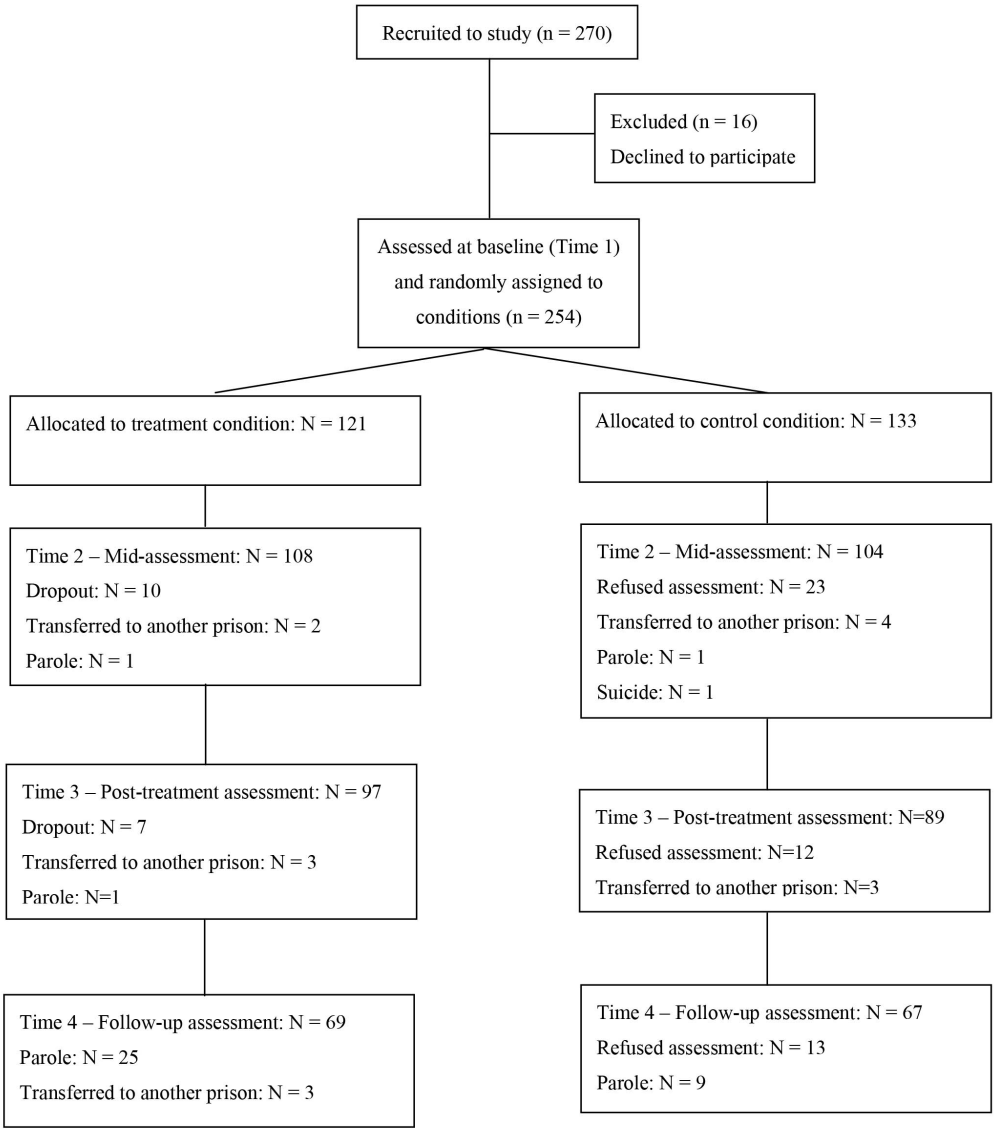

FIGURE 1. Flowchart of inmate participation

of attendance) was used to classify participants as completers, following the recommendations by Cullen et al. (2012). On average, inmates attended 30 sessions (M = 30.18; SD = 11.45) of the program. From the 133 controls, 67 (50.3%) fulfilled the protocol. As in the treatment group, attrition rates were due to transfer to another prison or parole, although a considerable number of controls refused to complete assessments (namely between the mid-treatment and follow-up assessments). Taking into account the considerable amount of missing data, a missing completely at random (MCAR) test was performed in order to evaluate the randomness of the missing values, and no patterns

were found in the missing data, MCAR (30) = 15.317; $p = .988$. Additionally, a chi-square test pointed to a nonsignificant difference between the treatment and control groups (w2 = 0.997; $p = .318$; Cramér's $V = .063$) in terms of missing values.

BASELINE DIFFERENCES

Both groups were compared on demographic characteristics, and no significant differences were found (all $p > .05$). In the treatment and control groups, the mean age was 28.24 ($SD = 6.32$) and 28.74 years old ($SD = 6.14$), respectively. Most participants were single (69.4% in the treatment group and 70.7% in the control group), with a low socioeconomic status[1] (94.2% in the treatment group and 97.0% in the control group).

The groups were also compared in terms of criminal characteristics, and no significant differences were found (all $p > .05$). In the treatment and control groups, the average sentence length was 111.53 ($SD = 59.25$) and 120.76 months ($SD = 63.22$), respectively. Even though participants were mainly first-time offenders (62.8% in the treatment group and 60.9% in the control group), most were charged with having committed several crimes (56.2% in the treatment group and 50.4% in the control group). Crimes for which they were sentenced to prison were predominantly against property (55.4% in the treatment group and 51.1% in the control group), followed by crimes against people (28.7% in the treatment group and 31.6% in the control group), drug-related offenses (14.2% in the treatment group and 13.5% in the control group), and crimes against the state (1.7% in the treatment group and 3.8% in the control group).[2]

Baseline differences between groups were also tested for the outcome measures, and no significant differences were found (all $p > .05$).[3]

PREVALENCE OF PERSONALITY DISORDERS[4]

In terms of the global prevalence rate (i.e., participants fulfilling criteria for at least one personality disorder), results showed a very high prevalence of personality disorders, with 94.1% of the complete sample fulfilling criteria for at least one personality disorder. The global prevalence rate was equally high for both groups (92.6% in the treatment group and 95.5% in the control group). Also, no significant difference was found when comparing the

1. Socioeconomic status (SES) was measured by inmates' profession, using the Portuguese professions classification (Instituto Nacional de Estatística, 2011). Examples of professions in the high SES group are judges, higher education professors, or medical doctors; in the medium SES group are nurses, psychologists, or school teachers; and in the low SES group are farmers, cleaning staff, or undifferentiated workers.

2. Crimes against property include robbery, theft, and qualified theft; crimes against people include simple and aggravated assault, intimidation, kidnapping, attempted homicide, and homicide; and crimes against the state include counterfeiting and forgery of documents.

3. Results are provided elsewhere (Brazão et al., 2017, 2018a, 2018b).

4. Results are presented for 253 participants, and not for the 254 inmates who agreed to participate in the original RCT, because one participant from the control group refused to answer the SCID-II questions. Therefore, this participant was not included in the analyses performed in the current study

proportion of participants with or without personality pathology in both groups (Fisher's = .947; p = .427; Cramér's V = .061).

ASPD was the most frequently identified main diagnosis in the complete sample, followed by paranoid personality disorder (see Table 2). The same tendency was found in both groups, and no significant differences were found in the distribution of the main diagnoses between participants in the treatment and control groups (Fisher's = 7.460; p = .483; Cramér's V = .184).

In addition to the main diagnosis (that in most cases was ASPD), and as presented in Figure 2, about half the participants fulfilled criteria for additional diagnoses (n = 120, 45.4% for the complete sample; n = 58, 51.8% for the treatment group; and n = 62, 49.2% for the control group). Both groups were similar regarding the proportion of participants presenting comorbidities (Fisher's = 1.013; p = .811; Cramér's V = .064).

LATENT PROFILE ANALYSIS (LPA)

Considering the high prevalence of ASPD and the high comorbidity rates found in the current sample, these two criteria were considered when exploring different personality pathology profiles.

Table 3 displays the LPA model fit statistics for the complete sample, showing that solutions with latent classes fitted the data better than a unitary solution without latent classes. The IC–based fit statistics (particularly BIC, but also AIC and SAS-BIC), along with entropy values, LMR/BLRT tests, and average probabilities of class membership, indicated that a four-class solution was the best model for allocating cases into profiles.

Table 4 displays profile allocation based on maximum posterior probability for the four latent profiles, as well as the mean scores in the number of diagnostic criteria met for ASPD and in the number of personality disorders diagnosed in each participant. The four profiles were labeled as: inmates without personality pathology, inmates with only ASPD, inmates with ASPD

TABLE 2. Frequency of the Main Diagnosis for the Complete Sample and by Groups

	Complete sample		Treatment group		Control group	
Personality Disorder	*n*	%	*n*	%	*n*	%
Paranoid	26	10.9	14	12.5	12	9.5
Schizotypal	2	0.8	—	—	2	1.6
Schizoid	1	0.4	1	0.9	—	—
Narcissistic	12	5.0	4	3.6	8	6.3
Borderline	9	3.8	6	5.4	3	2.4
Antisocial	168	70.6	78	69.6	90	71.4
Avoidant	3	1.3	1	0.9	2	1.6
Obsessive-Compulsive	5	2.1	1	0.9	4	3.2
Not otherwise specified	12	5.0	7	6.3	5	4.0

Note. Results are presented only for the presence of personality pathology within each main diagnosis. Fifteen participants are not counted in the table because they did not fulfill criteria for any personality disorder.

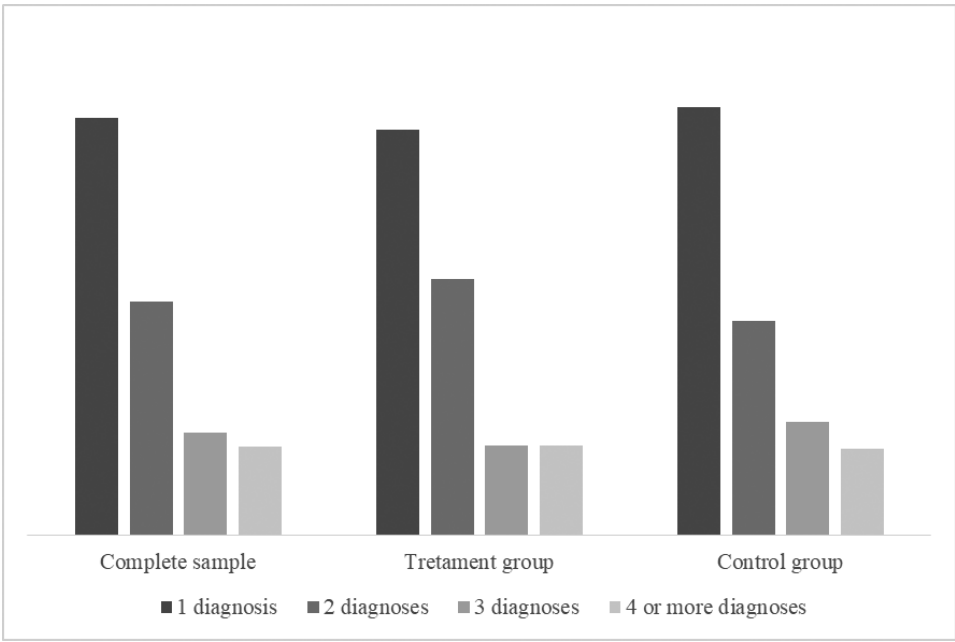

FIGURE 2. Frequency of comorbidity rate for the complete sample and by groups.

and low comorbidity (with one additional diagnosis), and inmates with ASPD and high comorbidity (with two or more additional diagnoses). The profile without personality pathology was the one with the lowest percentage of prison inmates (though superior to 1% as recommended by Bauer & Curran, 2004), followed by the profiles of ASPD and high comorbidity and ASPD and low comorbidity. The profile with only ASPD was the one with the highest percentage of participants. The average probabilities of class membership were always superior to .80, which indicated good class solution.

Treatment and control groups were then compared on the distribution of participants for each personality pathology profile. As presented in Table 5, there was no difference in the distribution of personality pathology profiles across the groups (Fisher's = 1.703; p = .640; Cramér's V = .082).

TABLE 3. Model Fit of the Latent Profile Analyses in the Complete Sample

	Log-likelihood	No. of free parameters	AIC	BIC	SSA-BIC	Entropy	LMR p value	BLRT p value
1 Class	–892.851	4	1793.70	1807.84	1795.16	—	—	—
2 Classes	–852.806	7	1719.61	1744.35	1722.16	.89	< .001	< .001
3 Classes	–825.398	10	1670.80	1706.13	1674.43	.89	< .001	< .001
4 Classes	**–766.549**	**13**	**1559.10**	**1605.03**	**1563.82**	**1.00**	**< .001**	**< .001**
5 Classes	–765.737	16	1563.47	1620.01	1569.29	.90	.55	1.0

Note. N = 253. Optima model is highlighted in boldface. AIC = Akaike information criteria; BIC = Bayesian information criteria; SSA-BIC = sample-size adjusted BIC; LMR = Lo-Mendell-Rubin test; BLRT = bootstrap likelihood ratio test.

TABLE 4. Profile Allocation Based on Maximum Posterior Probability for the Four Latent Profiles, and Mean Scores in ASPD and Number of PDs

Personality pathology profiles	*n*	%	ASPD	No. of PDs
Without personality pathology	15	6	0.40 (.18)	.00 (.00)
With only antisocial personality disorder	118	47	3.81 (.15)	1 (.00)
With antisocial personality disorder and low comorbidity	66	26	4.50 (.18)	2 (.00)
With antisocial personality disorder and high comorbidity	54	21	4.85 (.24)	3.46 (.07)

Note. Information for ASPD and number of PDs is presented as M (SE). ASPD = No. of diagnostic criteria met for antisocial personality disorder; number. No. of PDs = number of personality disorders diagnosed.

PERSONALITY PATHOLOGY PROFILES AS MODERATORS OF THE GPS EFFECTS

Table 6 displays the mean scores and standard deviations of the outcome measure in the timepoints by group and by personality pathology profile.[5] As previously specified, and in order to investigate the personality pathology profiles as moderators of the GPS effects, mixed ANOVAs were performed. Taking into account the small numbers observed in the profile "without personality pathology" (nine and six inmates in the treatment and control groups, respectively), this profile was not included in the analyses. On one hand, the results pointed to a significant time × condition effect for all outcome measures, confirming previous results (Brazão et al., 2017, 2018a, 2018b) in which treatment participants presented higher improvements on cognitive, emotion, and behavior regulation, when compared with controls. On the other hand, results revealed that time × condition × personality pathology profiles effects were non-significant, showing that change over time on the outcome measures (either in the treatment group or the control group) was not affected by personality pathology profiles (see Table 7).

In addition to the intent-to-treat analysis (in which all participants, including the non-completers, were considered), mixed ANOVAs were also carried out in accordance with the per-protocol approach (using only the participants who completed the protocol). The same tendency of results was observed, with non-significant time × condition × personality pathology profiles effects for all the outcome measures.

TABLE 5. Frequency of the Personality Pathology Profiles by Groups

	Treatment group		Control group	
Personality pathology profiles	*n*	%	*n*	%
Without personality pathology	9	7.4	6	4.5
With only antisocial personality disorder	54	44.6	64	48.5
With antisocial personality disorder and low comorbidity	34	28.1	32	24.2
With antisocial personality disorder and high comorbidity	24	19.8	30	22.7

5. For a graphical representation of change over time in the outcome measures by group and by personality pathology profiles, see figures in the Appendix.

TABLE 6. Means and Standard Deviations for the Outcome Measures in the Treatment and Control Groups by Personality Pathology Profiles

	Treatment group				Control group			
	T1	T2	T3	T4	T1	T2	T3	T4
Outcome measures	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
Maladaptive thinking								
With only antisocial personality disorder	114.09 (3.98)	108.90 (3.95)	100.74 (3.78)	85.97 (3.12)	122.40 (3.66)	116.35 (3.63)	116.96 (3.47)	119.70 (2.86)
With antisocial personality disorder and low comorbidity	124.47 (5.02)	114.63 (4.98)	101.14 (4.76)	88.70 (3.93)	130.28 (5.17)	132.63 (5.14)	139.92 (4.91)	136.45 (4.05)
With antisocial personality disorder and high comorbidity	137.70 (5.97)	135.55 (5.93)	117.28 (5.67)	96.16 (4.68)	124.03 (5.34)	119.39 (5.30)	124.59 (5.07)	123.65 (4.19)
Adaptive thinking								
With only antisocial personality disorder	31.81 (.85)	32.50 (.80)	34.46 (.86)	36.46 (.64)	32.25 (.76)	30.83 (.70)	30.55 (.86)	26.54 (.92)
With antisocial personality disorder and low comorbidity	32.70 (1.07)	33.99 (1.01)	34.43 (1.08)	36.14 (.80)	31.87 (1.08)	31.73 (.98)	29.47 (1.22)	25.01 (1.30)
With antisocial personality disorder and high comorbidity	31.50 (1.27)	33.85 (1.20)	33.48 (1.29)	35.97 (.96)	30.36 (1.12)	30.16 (1.02)	31.64 (1.26)	25.36 (1.34)
Early maladaptive schemas								
With only antisocial personality disorder	2.13 (.07)	1.89 (.07)	1.73 (.07)	1.47 (.04)	2.25 (.09)	2.10 (.08)	2.15 (.08)	2.35 (.07)
With antisocial personality disorder and low comorbidity	2.08 (.09)	2.04 (.09)	1.75 (.09)	1.52 (.05)	2.34 (.13)	2.20 (.12)	2.47 (.12)	2.58 (.10)
With antisocial personality disorder and high comorbidity	2.71 (.10)	2.39 (.11)	2.02 (.11)	1.58 (.06)	2.40 (.11)	2.31 (.12)	2.38 (.12)	2.58 (.13)
Expressive Suppression								
With only antisocial personality disorder	15.72 (.72)	15.35 (.66)	14.14 (.66)	9.61 (.48)	16.39 (.57)	17.39 (.43)	17.67 (.62)	18.50 (.60)
With antisocial personality disorder and low comorbidity	15.94 (.90)	17.37 (.84)	15.64 (.83)	9.43 (.61)	16.50 (.85)	18.87 (.88)	18.36 (.80)	19.41 (.61)
With antisocial personality disorder and high comorbidity	18.58 (1.08)	16.77 (1.00)	14.37 (.99)	10.96 (.73)	17.13 (.88)	17.27 (.83)	18.23 (.90)	19.21 (.63)
Cognitive Reappraisal								
With only antisocial personality disorder	25.87 (1.02)	26.97 (.90)	27.77 (.86)	28.40 (.80)	30.40 (.86)	28.94 (.76)	25.13 (.97)	21.32 (.81)
With antisocial personality disorder and low comorbidity	26.94 (1.28)	28.58 (1.14)	28.97 (1.08)	29.41 (1.01)	27.40 (1.22)	27.39 (1.08)	24.41 (1.37)	21.26 (1.14)
With antisocial personality disorder and high comorbidity	27.34 (1.53)	27.54 (1.35)	28.64 (1.20)	30.00 (1.29)	27.36 (1.26)	29.05 (1.11)	26.55 (1.41)	21.17 (1.18)
Number of disciplinary infractions								
With only antisocial personality disorder	1.81 (.40)	.77 (.25)	.42 (.23)	—	2.21 (.49)	2.10 (.61)	2.79 (.62)	—
With antisocial personality disorder and low comorbidity	1.85 (.50)	.97 (.31)	.41 (.23)	—	1.78 (.69)	2.93 (.86)	3.84 (.88)	—
With antisocial personality disorder and high comorbidity	2.95 (.60)	.75 (.37)	.27 (.16)	—	2.76 (.72)	3.76 (.89)	3.26 (.91)	—
Number of days in punishment								
With only antisocial personality disorder	12.96 (2.62)	6.64 (2.25)	2.66 (1.09)	—	10.28 (1.63)	14.75 (2.73)	16.68 (3.01)	—
With antisocial personality disorder and low comorbidity	15.08 (3.30)	8.55 (2.84)	3.17 (1.37)	—	11.84 (2.30)	16.59 (3.86)	18.78 (4.25)	—
With antisocial personality disorder and high comorbidity	17.91 (3.93)	7.83 (3.38)	1.12 (1.63)	—	12.73 (2.38)	10.13 (3.98)	15.46 (4.39)	—

Note. Cognitive and emotion regulation outcome measures (i.e., maladaptive and adaptive thinking, expressive suppression, and cognitive reappraisal) were collected in four time points: baseline (T1), mid-treatment (T2), post-treatment (T3), and follow-up (T4). Behavior regulation outcome measures (i.e., number of disciplinary infractions and number of days in punishment) were collected for three time intervals: during the 12 months before the beginning of the program (T1), during the GPS 12-month length (T2), and during the 12 months after GPS completion (T3).

TABLE 7. Mixed ANOVA With Time, Time × Condition, Time × Personality Pathology Profiles, and Time × Condition × Personality Pathology Profiles Effects for Each Outcome Measure

Outcome measures	Time	Time × Condition	Time × Personality Pathology Profiles	Time × Condition × Personality Pathology Profiles
Maladaptive thinking	$F = 26.962$; $p < .001$; $\eta^2_p = .104$	$F = 35.904$; $p < .001$; $\eta^2_p = .134$	$F = .558$; $p = .742$; $\eta^2_p = .005$	$F = 1.935$; $p = .083$; $\eta^2_p = .016$
Adaptive thinking	$F = 3.241$; $p = .027$; $\eta^2_p = .014$	$F = 37.949$; $p < .001$; $\eta^2_p = .141$	$F = 1.003$; $p = .417$; $\eta^2_p = .009$	$F = .692$; $p = .638$; $\eta^2_p = .006$
Early maladaptive schemas	$F = 22.597$; $p < .001$; $\eta^2_p = .089$	$F = 38.095$; $p < .001$; $\eta^2_p = .141$	$F = 1.817$; $p = .064$; $\eta^2_p = .022$	$F = .659$; $p = .657$; $\eta^2_p = .006$
Expressive suppression	$F = 26.560$; $p < .001$; $\eta^2_p = .103$	$F = 45.689$; $p < .001$; $\eta^2_p = .165$	$F = 2.597$; $p = .053$; $\eta^2_p = .031$	$F = 1.745$; $p = .158$; $\eta^2_p = .021$
Cognitive reappraisal	$F = 18.994$; $p < .001$; $\eta^2_p = .076$	$F = 22.517$; $p < .001$; $\eta^2_p = .088$	$F = .546$; $p = .758$; $\eta^2_p = .005$	$F = 1.028$; $p = .403$; $\eta^2_p = .009$
Number of disciplinary infractions	$F = 1.094$; $p = .336$; $\eta^2_p = .005$	$F = 12.449$; $p < .001$; $\eta^2_p = .051$	$F = .946$; $p = .437$; $\eta^2_p = .008$	$F = .831$; $p = .506$; $\eta^2_p = .007$
Number of days in punishment	$F = 5.305$; $p = .009$; $\eta^2_p = .022$	$F = 28.953$; $p < .001$; $\eta^2_p = .111$	$F = 1.210$; $p = .306$; $\eta^2_p = .010$	$F = .304$; $p = .835$; $\eta^2_p = .003$

DISCUSSION

A randomized controlled trial was conducted with male prison inmates in Portuguese prisons in order to assess the efficacy of the Growing Pro-Social program (GPS; Rijo et al., 2007). Previous studies (Brazão et al., 2017, 2018a) have already confirmed GPS efficacy in reducing cognitive malfunctioning (use of cognitive distortions and the endorsement of early maladaptive schemas), as well as anger, shame, and paranoia. The GPS has also proven to be effective in reducing emotion regulation difficulties, as well as disciplinary infractions/prison misconduct (Brazão et al., 2018b). However, these studies did not assess treatment moderators, namely personality disorders, which have been found to be highly prevalent among male prison inmates (e.g., Brazão et al., 2015). Moreover, there is empirical evidence that individuals with severe personality pathology are less responsive to treatment (Beck et al., 2015; Levenson et al., 2012; Moran & Crawford, 2013; Rafaeli et al., 2011), and are more likely to re-offend (Kennealy et al., 2010; Walters & Heilbrun, 2010; Walters et al., 2008).

The current study tried to cover this issue and included a secondary data analysis of information collected from inmates who had participated in the original trial. This study's main goal was, therefore, to investigate personality pathology profiles as moderators of the GPS effects on cognitive, emotion, and behavior regulation in male prison inmates. Specifically, it tested whether change over time on adaptive thinking, cognitive distortions and early maladaptive schemas (cognitive level), expressive suppression and cognitive reappraisal (emotion level), and prison misconduct (behavior level) was affected by personality pathology severity. It was hypothesized that inmates with severe personality pathology would be less responsive to the GPS treatment and, consequently, would present less improvement on cognitive, emotion, and behavior regulation when compared with inmates with mild and/or

moderate personality pathology. It was also expected that controls with severe personality pathology would present a worsening on cognitive, emotion, and behavior regulation over time when compared with controls with mild and/or moderate personality pathology. To the best of our knowledge, there is a lack of RCTs testing personality disorders as treatment moderators in forensic samples, specifically in male prison inmates.

Preliminary analyses on the prevalence of personality disorders showed that personality pathology was highly prevalent in the current sample, with most inmates fulfilling criteria for ASPD. A high comorbidity rate was also found, which is consistent with previous studies (e.g., Brazão et al., 2015). Following these findings, latent profile analysis (LPA) was carried out in order to identify different personality pathology profiles within the current sample. LPA identified four different profiles, namely: inmates without personality pathology; inmates with only ASPD; inmates with ASPD and low comorbidity (with one additional diagnosis); and inmates with ASPD and high comorbidity (with two or more additional diagnoses). It is noteworthy that the profile "without personality pathology" was the one with the lowest percentage of prison inmates, while the profile with only ASPD was the one with the highest percentage of inmates. The percentage of inmates in the comorbidity (low and high) profiles was also high. Taken together, these findings emphasize that most inmates present highly complex treatment needs and should receive mental health care from specially trained staff (Steadman, Osher, Clark-Robbins, Case, & Samuels, 2009). Penitentiary services should also provide systematic and effective screening procedures for proper assessment of personality disorders at prison intake (e.g., Roberts & Coid, 2009). The high prevalence of personality disorders and comorbidity rates in male prison inmates represents a highly significant level of clinical and functional impairment, which may cause disruption within and beyond prison settings (e.g., Gilbert & Daffern, 2011). It is then justifiable that the treatment of personality disorders should be addressed in forensic case management procedures as a focus of intervention (Brazão et al., 2015).

Results from mixed ANOVAs showed that personality pathology profiles were not significant moderators of the GPS effects, that is, that change over time on cognitive functioning, emotion regulation difficulties, and prison misconduct was not affected by personality pathology severity. The GPS program was shown to be effective in changing the cognitive, emotion, and behavior correlates of antisocial behavior, either with inmates with mild pathology (with only ASPD), moderate pathology (with ASPD and low comorbidity), and severe pathology (with ASPD and high comorbidity). The GPS program is strongly based in schema therapy that was specifically designed to meet and address personality disorder criteria (Rafaeli et al., 2011; Young et al., 2003). Moreover, schema therapy has proven to be effective in reducing severe personality disorder malfunctioning (Farrell, Shaw, & Webber, 2009; Giesen-Bloo et al., 2006; Nadort et al., 2009; van Asselt et al., 2008), namely in male prison inmates with antisocial, borderline, narcissistic, and paranoid personality disorders (Bernstein et al., 2012; Keulen-de Vos, Bernstein, & Arrntz, 2013).

In accordance with the *Diagnostic and Statistical Manual of Mental Disorders,* fifth edition (*DSM-5*; APA, 2013), personality pathology is

characterized by an enduring pattern of inner experience and behavior that deviates markedly from the expectations of the individual's culture. This pattern is manifested in cognition (i.e., dysfunctional core beliefs about the self and the others, biased social information processing), affectivity (i.e., emotion regulation difficulties), interpersonal functioning, and impulse control (i.e., behavior dysregulation). The GPS addresses cognitive, emotion, and behavior (dys)regulation across the program's modules (Brazão, da Motta, & Rijo, 2013; Rijo et al., 2007), which may explain the positive effects observed in treatment participants, regardless of personality pathology severity.

Behavior regulation is directly addressed in Modules 1 and 2—Communication and Interpersonal Relationships—in which participants learned to cope in a healthy and prosocial way with obstacles in the communication process, as well as to use negotiation skills to deal with interpersonal conflicts. Difficulties in communication and interpersonal relationships are common among patients with personality disorders (APA, 2013), and the tasks during these initial modules may have contributed to promoting interpersonal adjustment, thus diminishing disciplinary infractions inside prison.

The positive effects on emotion regulation, regardless of personality pathology severity, may be related to specific tasks used during Module 4—Function and Meaning of Emotions. This module was specifically designed to promote emotion regulation by increasing the awareness and understanding about the function, meaning, and adaptive value of emotions and emotion dysregulation–related problems, which, in turn, have systematically been associated with personality disorders (e.g., Glenn & Klonsky, 2009; Putman & Silk, 2005; Stepp et al., 2014). Moreover, and considering the positive association between emotion regulation difficulties and prison misconduct (e.g., Ammerman, Kleiman, Uyeji, Knorr, & McCloskey, 2015; Roll, Koglin, & Petermann, 2012; Velotti et al., 2016), the positive effects observed for emotion regulation in all personality pathology profiles could explain, at least partially, the equally positive effects observed in prison misconduct.

Modules 3 and 5—Cognitive Distortions and Early Maladaptive Schemas, respectively—directly address cognitive malfunctioning. In Module 3, cognitive distortions are identified, and participants are trained to think in a more realistic, healthy, and pro-social way. In turn, in Module 5, early maladaptive schemas related to aggressive and antisocial behavior (Chakhssi, Bernstein, & de Ruiter, 2012; Gilbert & Daffern, 2011; Shorey, Anderson, & Stuart, 2014) are identified, and participants are encouraged to fight against their own schemas. It is important to add that the schemas addressed by the GPS are not exclusively related to ASPD. For instance, the mistrust/abuse schema has also been associated with paranoid personality disorder, while grandiosity/entitlement has been also related to narcissistic personality disorder (Chakhissi et al., 2012). There is also empirical evidence that abandonment, emotional deprivation, and defectiveness/shame schemas are associated with borderline personality disorder (Gilbert & Daffern, 2011). Therefore, the program's promotion of change at a schema level may affect schemas that are associated with the maintenance of a broader range of personality disorders (paranoid, narcissistic, borderline), which could explain the GPS undeferential effects over cognitive malfunctioning in the treatment group. In other words,

and considering the high comorbidity rates found in the current study, the GPS achieved positive effects over cognitive malfunctioning, not only in inmates with ASPD, but also in individuals with other personality disorders for which other therapeutic interventions focus on early maladaptive schemas (the same as the GPS program) as targets of change (Farrell et al., 2009; Giesen-Bloo et al., 2006; Nadort et al., 2009; van Asselt et al., 2008).

Another possible explanation for the positive effects of the GPS, regardless of the severity of personality disorders, may be related to nonspecific factors, namely the fact that inmates were included in a regular group activity, which per se might be helpful, considering that inmates participating in this study did not attend any other intervention program or treatment.

Concerning the control group, participants presented a worsening or no change over time, regardless of the personality pathology severity, confirming previous findings (Brazão et al., 2017, 2018a, 2018b), which suggest that inmates who received solely the treatment as usual in Portuguese prisons (which does not include any intervention program) may maintain or reinforce psychological and emotional processes related to dysfunctional behavior (Brazão et al., 2018a; Lambie & Randell 2013; Morgan et al., 2012) and personality disorder symptoms (Brazão et al., 2015). As previously specified, change over time in the control group was not affected by personality pathology severity. A possible explanation for this unexpected result may reside in the fact that personality disorders in forensic samples, and specifically in male prison inmates, are associated with higher clinical and functional impairment than in non-clinical and clinical samples (Black, Gunter, Loveless, Allen, & Sieleni, 2010). In this sense, and although inmates with only ASPD have been classified as presenting mild personality pathology, clinical practice with offenders diagnosed with ASPD (without comorbidity) shows that these individuals are severely disturbed. The different personality pathology profiles may then be underrepresented in the current sample, considering that most inmates were severely disturbed (regardless of the personality pathology profile), thus not presenting significant differences in the trajectory of change on the outcome measures over time.

Our findings have a number of limitations, most obviously the fact that the capability of the GPS to reduce personality disorders symptoms was not investigated. Considering that the main goal of the current study was to assess personality disorders as treatment moderators, personality pathology was only assessed at baseline, which did not allow testing the GPS effects on dysfunctional personality traits. Another limitation has to do with the small number of inmates without personality pathology in the current sample, which did not allow for reliable comparisons between inmates with and without personality disorders in change on the outcome measures over time. Nonetheless, future studies should test the GPS differential effects in inmates with and without personality disorders. Future studies should also assess psychopathic traits as treatment moderators, considering that psychopathy is a significant variant of ASPD (which is highly prevalent among male prison inmates). The absence of inter-rater and reliability indicators of the SCID-II encompasses another limitation. Though the researchers tried to minimize this limitation with training and supervision of the interviewers, future studies should overcome this issue. Another limitation is that most data were collected through self-report

measures, which are not free from response bias. Self-report methodology may have introduced bias into the findings.

It is important to add that the GPS effects in the reduction of criminal recidivism rates were not analyzed in this study. The positive effects of a rehabilitation program on recidivism rates are usually presented as a major requirement for the selection of effective intervention practices (e.g., McGuire 2011, 2013). In this sense, it seems of the utmost importance to test whether the positive changes in cognitive, emotion, and behavior regulation result in a significant reduction of re-offending, thus contributing to criminal career desistance.

Generalizations should be made carefully because participants included only male prison inmates. Future studies should also test personality disorders as treatment moderators among female prison inmates. Considering that the current sample was mainly involved in acquisitive offending, it seems relevant to test treatment and moderator effects in violent and persistent offenders, while accounting for the risk profile of the sample (low, moderate, or high risk). Replication of these findings in other settings (e.g., in community-based interventions), as well as in other countries, will speak to the generalizability of the program in reducing the cognitive, emotional, and behavioral patterns associated with personality disorders.

Overall, findings suggested that inmates with personality disorders (regardless of the pathology severity) could benefit from structured cognitive-behavioral group interventions, such as the GPS program, which stresses the need to provide appropriate treatment to inmates with personality pathology. Findings also suggested that the GPS program could be used as a universal delivery program, namely with severely disturbed inmates, taking into account that participants were responsive to treatment and presented improvements on cognitive, emotion, and behavior regulation outcomes. In other words, severe personality pathology may not be considered as an exclusion criterion concerning GPS delivery. Although our results showed no differences between individuals with mild, moderate, and severe personality pathology (either in the treatment group or the control group), adherence to standard clinical treatment for personality disorders in prisons seems mandatory (Brazão et al., 2015). Moreover, available treatment programs may be adapted for individuals with personality disorders, and could also be focused on the reduction of dysfunctional personality traits.

REFERENCES

Akaike, H. (1987). Factor analysis and AIC. *Psychometrika, 52,* 317–332. https://doi.org/10.1007/BF02294359

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.

Ammerman, B. A., Kleiman, E. M., Uyeji, L. L., Knorr, A. C., & McCloskey, M. S. (2015). Suicidal and violent behavior: The role of anger, emotion dysregulation, and impulsivity. *Personality and Individual Differences*, *79*, 57–62. https://doi.org/10.1016/j.paid.2015.01.044

Andrews, D. A., & Bonta, J. (2010). *The psychology of criminal conduct*. Newark, NJ: LexisNexis/Matthew Bender.

Antonio, M. E., & Crossett, A. (2017). Evaluating the effectiveness of the national curriculum and training institute's "Cognitive Life

Skills" Program among parolees supervised by Pennsylvania's Board of Probation & Parole. *American Journal of Criminal Justice, 42,* 514–532. https://doi.org/10.1007/s12103-016-9366-2

Bauer, D. J., & Curran, P. J. (2004). The integration of continuous and discrete latent variable models: Potential problems and promising opportunities. *Psychological Methods*, *9*, 3–29. https://doi.org/10.1037/1082-989X.9.1.3

Beck, A. T., Davis, D. D., & Freeman, A. (2015). *Cognitive therapy of personality disorders* (3rd ed.). New York, NY: Guilford.

Bernstein, D. P., Nijman, H. L. I., Karos, K., Keulen-de-Vos, M. K., de Vogel, V, & Lucker, T. P. (2012). Schema therapy for forensic patients with personality disorders: Design and preliminary findings of a multicenter randomized clinical trial in the Netherlands. *International Journal of Forensic Mental Health*, *11*, 312–324. https://doi.org/10.1080/14999013.2012.746757

Black, D. W., Gunter, T., Loveless, P., Allen, J., & Sieleni, B. (2010). Antisocial personality disorder in incarcerated offenders: Psychiatric comorbidity and quality of life. *Annals of Clinical Psychiatry*, *22*, 113–120.

Brazão, N., da Motta, C., & Rijo, D. (2013). From multimodal programs to a new cognitive-interpersonal approach in the rehabilitation of offenders. *Aggression and Violent Behavior*, *18*, 636–643. https://doi:.org/10.1016/j.avb.2013.07.018

Brazão, N., da Motta, C., Rijo, D., & Pinto-Gouveia, J. (2015). The prevalence of personality disorders in Portuguese male prison inmates: Implications for the penitentiary treatment. *Análise Psicológica*, *3*, 279–290. https://doi.org/10.14417/ap.975

Brazão, N., Rijo, D., Salvador, M. C., & Pinto-Gouveia, J. (2017). The effects of the Growing Pro-Social Program on cognitive distortions and early maladaptive schemas over time in male prison inmates: A randomized controlled trial. *Journal of Consulting and Clinical Psychology*, *11*, 1064–1079. https://doi.org/10.1037/cc p0000247

Brazão, N., Rijo, D., Salvador, M. C., & Pinto-Gouveia, J. (2018a). The efficacy of the Growing Pro-Social Program in reducing anger, shame and paranoia over time in male prison inmates: A randomized controlled trial. *Journal of Research in Crime and Delinquency*, *55*, 649–686. https://doi.org/10.1177/0022427818782733

Brazão, N., Rijo, D., Salvador, M. C., & Pinto-Gouveia, J. (2018b). Promoting emotion and behavior regulation in male prison inmates: A secondary data analysis from a randomized controlled trial testing the efficacy of the Growing Pro-Social Program. *Law and Human Behavior*, *42*, 57–70. https://doi.org/10.1037/lhb0000267

Carr, S. N., & Francis, A. J. P. (2010). Early maladaptive schemas and personality disorder symptoms: An examination in a non-clinical sample. *Psychology and Psychotherapy: Theory, Research and Practice*, *83*, 333–349. https://doi.org/10.1348/147608309X481351

Chakhssi, F., Bernstein, D. P., & de Ruiter, C. (2012). Early maladaptive schemas in relation to facets of psychopathy and institutional violence in offenders with personality disorders. *Legal and Criminological Psychology*, *18*, 1–17. https://doi.org/10.1 111/lcrp.12002

Clarke, A. Y., Cullen, A. E., Walwyn, R., & Fahy, T. (2010). A quasi-experimental pilot study of the Reasoning and Rehabilitation programme with mentally disordered offenders. *Journal of Forensic Psychiatry & Psychology*, *21*, 490–500. https://doi.org/10.1080/14789940903236391

Cullen, A. E., Clarke, A. Y., Kuipers, E., Hodgins, S., Dean, K., & Fahy, T. (2012). A multi-site randomized controlled trial of a cognitive skills program for male mentally disordered offenders: Social-cognitive outcomes. *Psychological Medicine*, *42*, 557–569. https://doi.org/10.1017/S0033291711001553

Dinis, A., & Pinto-Gouveia, J. (2007). *The Portuguese version of the Emotion Regulation Questionnaire*. Unpublished manuscript

Duggan, C., & Howard, R. (2009). The "functional link" between personality disorder and violence: A critical appraisal. In M. McMurran & R. Howard (Eds.), *Personality, personality disorder, and violence: An evidence-based approach* (pp. 19–37). New York, NY: Wiley-Blackwell.

Emilsson, B., Gudjonsson, G., Sigurdsson, J. F., Baldursson, G., Einarsson, E., Olafsdottir, H., & Young, S. (2011). Cognitive behaviour therapy in medication-treated adults with ADHD and persistent symptoms: A randomized controlled trial. *BMC Psychiatry*, *11*, 116–125. https://doi.org/10.1186/1471-244X-11-116

Farrell, J. M., Shaw, I. A., & Webber, M. A. (2009). A schema-focused approach to group psychotherapy for outpatients with borderline personality disorder: A randomized clinical trial. *Journal of Behavior Therapy and Experimental Psychiatry, 40*, 317–328. https://doi.org/10.1016/j.jbtep.2009.01.002

Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, *41*, 1149–1160. https://doi.org/10.3758/BRM.41.4.1149

Fazel, S., & Danesh, J. (2002). Serious mental disorder in 23000 prisoners: A systematic review

of 62 surveys. *Lancet, 359*, 545–550. https://doi.org/10.1016/S0140-6736(02)07740-1

First, M. B., Gibbon, M., Spitzer, R. L., Williams, J. B. W., & Benjamin, L. S. (1997). *Structured Clinical Interview for DSM-IV Axis II Personality Disorders (SCID-II)*. Washington, DC: American Psychiatric Press.

Giesen-Bloo, J., van Dyck, R., Spinhoven, P., van Tilburg, W., Dirksen, C., van Asselt, T., . . . Arntz, A. (2006). Outpatient psychotherapy for borderline personality disorder: Randomized trial of schema-focused therapy vs. transference-focused psychotherapy. *Archives of General Psychiatric*, *63*, 649–658. https://doi.org/10.1001/archpsyc.63.6.649

Gilbert, F., & Daffern, M. (2011). Illuminating the relationship between personality disorder and violence: Contributions of the General Aggression Model. *Psychology of Violence, 1*, 230–244. https://doi.org/10.1037/a0024089

Glenn, C. R., & Klonsky, D. K. (2009). Emotion dysregulation as a core feature of borderline personality disorder. *Journal of Personality Disorders*, *23*, 20–28. https://doi.org/10.1521/pedi.2009.23.1.20

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Personality and Individual Differences*, *85*, 348–362. https://doi.org/10.1037/0022-3514.85.2.348

Hayes, A. F., & Rockwood, N. J. (2017). Regression-based statistical mediation and moderation analysis in clinical research: Observations, recommendations, and implementation. *Behaviour Research and Therapy*, *98*, 39–57. https:/doi.org/10.1016/j.br at.2016.11.001

Hiscoke, U. L., Långström, N., Ottosson, H., & Grann, M. (2003). Self-reported personality traits and disorders (DSM-IV) and risk of criminal recidivism: A prospective study. *Journal of Personality Disorders, 17*, 293–305. https://doi.org/10.1521/pedi.17.4.293.23966

Instituto Nacional de Estatística. (2011). *Classificação Portuguesa das profissões 2010* [2010 Portuguese classification of professions]. Lisboa, Portugal: Instituto Nacional de Estatística.

Kennealy, P. J., Skeem, J. L., Walters, G. D., & Camp, J. (2010). Do core interpersonal and affective traits of PCL-R psychopathy interact with antisocial behavior and disinhibition to predict violence? *Psychological Assessment*, *22*, 569–580. https://doi.org/10.1037/a0019618

Keulen-de Vos, M., Bernstein, D. P., & Arntz, A. (2013). Schema therapy for aggressive offenders with personality disorders. In R. C. Trafate & D. Mitchell (Eds.), *Forensic CBT: A handbook for clinical practice* (pp. 66–85). Chichester, UK: Wiley-Blackwell.

Kjelsberg, E., Harting, P., Bowitz, H., Kuisma, I., Norbech, P., Rustad, A. B., . . . Vik, T. G. (2006). Mental health consultations in a prison population: A descriptive study. *BMC Psychiatry, 6*, 27. https://doi.org/10.1186/1471-244X 6-27

Kropp, P. R., Hart, S. D., Webster, C. D., & Eaves, D. (1995). *Manual for the spousal assault risk assessment guide*. Vancouver, Canada: The British Columbia Institute on Family Violence.

Lambie, I., & Randell, I. (2013). The impact of incarceration on juvenile offenders. *Clinical Psychology Review*, *33*, 448–459. https://doi.org/10.1016/j.cpr.2013.01.007

Leal, J. (2008). *Angry Cognitions Scale: Estudos psicométricos* [Angry Cognitions Scale: Psychometric studies] (unpublished master's thesis). University of Coimbra, Coimbra, Portugal.

Levenson, J. C., Wallace, M. L., Fournier, J. C., Rucci, P., & Frank, E. (2012). The role of personality pathology in depression treatment outcome with psychotherapy and pharmacotherapy. *Journal of Consulting and Clinical Psychology*, *80*, 719–729. https://doi.org/10.1037/a0029396

Lo, Y., Mendell, N., & Rubin, D. (2001). Testing the number of components in a normal mixture. *Biometrika, 88,* 767–778. https://doi.org/10.1093/biomet/88.3.767

Lobbestael, J., & Arntz, A. (2010). Emotional, cognitive, and psychological correlates of abuse-related stress in borderline and antisocial personality disorder. *Behavior Therapy and Research*, *48*, 116–124. https://doi.org/10.1016/j.brat.2009.09.015

Lubke, G., & Muthén, B. O. (2007). Performance of factor mixture models as a function of model size, covariate effects, and class-specific parameters. *Structural Equation Modeling, 14,* 26–47. https://doi.org/10.1080/10705510709336735

Manders, W. A., Deković, M., Asscher, J. J., van der Lan, P. H., & Prins, P. J. M. (2013). Psychopathy as predictor and moderator of multisystemic therapy outcomes among adolescents treated for antisocial behavior. *Journal of Abnormal Child Psychology, 41*, 1121–1132. https://doi.org/10.1007/s10802-013-9749-5

Martin, R. C., & Dahlen, E. R. (2007). The angry cognitions scale: A new inventory for assessing cognitions in anger. *Journal of Rational-Emotive & Cognitive-Behavior Therapy, 25*, 155–173. https://doi.org/10.1007/s10942-006-0033-2

Mascha, E. J., Dalton, J. E., Kurz, A., & Saager, L. (2013). Understanding the mechanism: Mediation analysis in randomized and nonrandomized studies. *Economics, Education,*

and Policy, *117*, 980–994. https://doi.org/10.1213/ANE.0b013e318 2a44cb9

McGuire, J. (2011). Reducing recidivism of adult offenders: A review of methods and outcomes. *Ousar Integrar—Revista de Reinserção Social e Prova, 8,* 9–25.

McGuire, J. (2013). "What works" to reduce reoffending: 18 years on. In L. A. Craig, L. Dixon, & T. A. Gannon (Eds.), *What works in offender rehabilitation: An evidence-based approach to assessment and treatment* (pp. 20–49). Chichester, UK: Wiley-Blackwell.

McLachlan, G., & Peel, D. (2004). *Finite mixture models*. New York, NY: Wiley.

Moher, D., Hopewell, S., Schulz, K. F., Montori, V., Gotzsche, P. C., Devereaux, P. J. . . . Altman, D. G. (2010). CONSORT 2010 Explanation and Elaboration: Updated guidelines for reporting parallel group randomised trials. *BMJ*, *340*, 698-702. https://doi.org/10.1136/bmj.c869

Moldovan, R., & Pintea, S. (2015). Mechanisms of change in psychotherapy: Methodological and statistical considerations. *Cognition, Brain, Behavior. An Interdisciplinary Journal*, *19*, 299–311.

Moran, P., & Crawford, M. J. (2013). Assessing the severity of borderline personality disorder. *British Journal of Psychiatry*, *203*, 163–164. https://doi.org/10.1192/bjp.bp.113.128249

Morgan, R. D., Flora, D. B., Kroner, D. G., Mills, J. F., Varghese, F., & Steffan, J. S. (2012). Treating offenders with mental illness: A research synthesis. *Law and Human Behavior*, *36*, 37–50. https://doi.org/10.1037/h0093964

Morin, A. J. S. (2016). Person-centered research strategies in commitment research. In J. P. Meyer (Ed.), *The handbook of employee commitment* (pp. 490–508). Cheltenham, UK: Edward Elgar.

Muthén, B. (2001). Latent variable mixture modeling. In G. A. Marcoulides & R. E. Schumacker (Eds.), *New developments and techniques in structural equation modeling* (pp. 1–33). Mahwah, NJ: Erlbaum.

Nadort, M., Arntz, A., Smit, J. H., Giesen-Bloo, J., Eikelenboom, M., Spinhoven, P., . . . van Dyck, R. (2009). Implementation of outpatient schema therapy for borderline personality disorder with versus without crisis support by the therapist outside office hours: A randomized trial. *Behavior Research and Therapy, 47*, 961–973. https://doi.org/10.1016/j.brat.2009.07.013

Nylund, K. L., Asparouhov, T., & Muthén, B. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling. A Monte Carlo simulation study. *Structural Equation Modeling, 14,* 535–569. https://doi.org/10.1080/107 05510701575396

Pinto-Gouveia, J., Matos, A. P., Rijo, D., Castilho, P., & Salvador, M. C. (1999). *Entrevista Clínica Estruturada para as Perturbações da Personalidade do Eixo II do DSM-IV—Versão Portuguesa* [The Structured Clinical Interview for DSM-IV Axis II Personality Disorders—Portuguese version]. Coimbra, Portugal: Faculdade de Psicologia e Ciências da Educação da Universidade de Coimbra.

Pinto-Gouveia, J., Rijo, D., & Salvador, M. C. (2006). *The Portuguese version of the Young Schema Questionnaire*. Unpublished manuscript.

Putman, K. M., & Silk, K. R. (2005). Emotion dysregulation and the development of borderline personality disorder. *Development and Psychopathology*, *17*, 899–925. https://doi.org/10.10170S0954579405050431

Rafaeli, E., Bernstein, D. P., & Young, J. (2011). *Schema therapy: Distinctive features*. New York, NY: Routledge.

Ram, N., & Grimm, K. J. (2009). Growth mixture modeling: A method for identifying difference in longitudinal change among unobserved groups. *International Journal of Behavioral Development, 33*, 565–576. https://doi.org/10.1177/0165025409343 765

Redondo, S., Martínez-Catena, A., & Andrés-Pueyo, A. (2012). Therapeutic effects of a cognitive-behavioural treatment with juvenile offenders. *European Journal of Psychology Applied to Legal Context, 4*, 159–178.

Rijkeboer, M. M., Bergh, H., & Bout, J. (2005). Stability and discriminative power of the Young Schema-Questionnaire in a Dutch clinical versus non-clinical population. *Journal of Behavior Therapy and Experimental Psychiatry, 36*, 129–144. https://doi.org/10.1016/j.jbtep.2004.08.005

Rijo, D. (2009). *Esquemas Mal-Adaptativos Precoces: Validacão do conceito e dos métodos de avaliacão* [Early Maladaptive Schemas: Construct and assessment methods validation studies]. Unpublished doctoral dissertation. University of Coimbra, Coimbra, Portugal.

Rijo, D. (2017). O Questionário de Esquemas de Young [Young Schema Questionnaire] (YSQ-S3). In M. M. Gonçalves, M. R. Simões, & L. S. Almeida (Eds.), *Psicologia clínica e da saúde: Instrumentos de avaliação* [Clinical and health psychology: Evaluation tools] (pp. 159–174). Lisboa, Portugal: PACTOR.

Rijo, D., Sousa, M. N., Lopes, J., Pereira, J., Vasconcelos, J., Mendonça, M. C., . . . Massa, S. (2007). *Gerar Percursos Sociais: Programa de prevenção e reabilitação para jovens com comportamento social desviante* [Growing Pro-Social: Prevention and rehabilitation program for youths with deviant social behavior]. Ponta Delgada, Portugal: EQUAL.

Roberts, A., & Coid, J. (2010). Personality disorder and offending behaviour: Findings from the national survey of male prisoners in England and Wales. *Journal of Forensic Psychiatry*

& Psychology, 21, 221–237. https://doi.org/10.1080/14789940903303 811

Roll, J., Koglin, U., & Petermann, F. (2012). Emotion regulation and childhood aggression: Longitudinal associations. *Child Psychiatry & Human Development, 43*, 909–923. https://doi.org/10.1007/s10578-012-0303-4

Rost, J. (2006). Latent-class-analyse [Latent class analysis]. In F. Petermann & M. Eid (Eds.), *Handbuch der psychologischen Diagnostik* [Handbook of psychological assessment] (pp. 275–287). Göttingen, Germany: Hogrefe.

Schwartz, G. (1978). Estimating the dimension of a model. *Annals of Statistics, 6*, 461–464.

Sclove, L. (1987). Application of model-selection criteria to some problems in multivariate analysis. *Psychometrika, 52,* 333–343. https://doi.org/10.1007/BF02294360

Shorey, R. C., Anderson, S., & Stuart, G. L. (2014). The relation between antisocial and borderline personality symptoms and early maladaptive schemas in a treatment-seeking sample of male substance users. *Clinical Psychology and Psychotherapy*, *21*, 341–351. https://doi.org/10.1002/cpp.1843

Short, V., Lennox, C., Stevenson, C., Senior, J., & Shaw, J. (2012). *Mental illness, personality disorder and violence: A scoping review*. Manchester, UK: Offender Health Research Network.

Skeem, J. L., Polaschek, D. L., & Manchak, S. (2009). Appropriate treatment works but how? Rehabilitating general psychopathic, and high-risk offenders. In J. L. Skeem, K. S. Douglas, & S. O. Lillenfeld (Eds.), *Psychological science in the courtroom: Consensus and controversy* (pp. 358–384). New York, NY: Guilford.

Steadman, A. J., Osher, F. C., Clark-Robbins, P., Case, B., & Samuels, S. (2009). Prevalence of serious mental illness among jail inmates. *Psychiatric Services, 60*, 761–765. doi: 10.1176/ps.2009.60.6.761

Stepp, S. D., Scott, L. N., Morse, J. Q., Nolf, K. A., Hallquist, M. N., & Pilkonis, P. A. (2014). Emotion dysregulation as a maintenance factor of borderline personality disorder features. *Comprehensive Psychiatry*, *55*, 657–666. https://doi.org/10.1016/j.comppsych.2013.11.006

Tabachnick, B., & Fidell, L. (2013). *Using multivariate statistics* (6th ed.). Boston, MA: Pearson.

Tardiff, K. (2001). Axis II disorders and dangerousness. In G. F. Pinard & L. Paganini (Eds.), *Clinical assessment of dangerousness: Empirical contributions* (pp. 103–120). New York, NY: Cambridge University Press.

Teplin, L. (1994). Psychiatric and substance abuse disorders among male urban jail detainees. *American Journal of Public Health, 84*, 290–293. https://doi.org/10.2105/AJPH.84.2.290

Thornton, A. J. V., Graham-Kevan, N., & Archer, J. (2010). Adaptive and maladaptive personality traits as predictors of violent and nonviolent offending behavior in men and women. *Aggressive Behavior, 36*, 177–186. https://doi.org/10.1002/ab.20340

van Asselt, A. D., Dirksen, C. D, Arntz, A., Giesen-Bloo, J. H., van Dijk, R., Spinhoven, P., . . . Severens, J. L. (2008). Outpatient psychotherapy for borderline personality disorder: Cost-effectiveness of schema-focused therapy versus transference-focused therapy. *British Journal of Psychiatry, 192*, 450–457. https://doi.org/10.1001/archpsyc.63.6.649

Velotti, P., Garofalo, C., Petrocchi, C., Cavallo F., Popolo, R., & Dimaggio, G. (2016). Alexithymia, emotion dysregulation, impulsivity and aggression: A multiple mediation model. *Psychiatry Research*, *30*, 296–303. https://doi.org/0.1016/j.psychres.2 016.01.025

Walters, G. D., & Heilbrun, K. (2010). Violence risk assessment and facet 4 of the Psychopathy Checklist: Predicting institutional and community aggression in two forensic samples. *Assessment*, *17*, 259–268. https://doi.org/10.1177/1073191109356685

Walters, G. D., Knight, R. A., Grann, M., & Dahle, K. P. (2008). Incremental validity of the Psychopathy Checklist facet scores: Predicting release outcome in six samples. *Journal of Abnormal Psychology*, *117*, 396–405. https://doi.org/10.1037/0021-843X.117.2 .396

Warren, J. I., Burnette, M., South, S. C., Chauhan, P., Bale, R., & Friend, R. (2002). Personality disorders and violence among female prison inmates. *Journal of the American Academy of Psychiatry and the Law, 30*, 502–509.

Warren, J. I., & South, S. C. (2009). A symptom-level examination of the relationship between cluster B personality disorders and patterns of criminality and violence in women. *International Journal of Law and Psychiatry, 32*, 10–17. https://doi.org/10.1016/j.ijlp.2008.11.005

Webster, C. D., Douglas, K. S., Eaves, D., & Hart, S. D. (1997). *HCR-20. Assessing risk for violence. Version 2*. Vancouver, Canada: Simon Fraser University, Mental Health, Law and Police Institute.

Young, J. E. (1990). *Cognitive therapy for personality disorders: A schema-focused approach*. Sarasota, FL: Professional Resource Exchange.

Young, J. E., Klosko, J. S., & Weishaar, M. E. (2003). *Schema therapy. A practioner's guide*. New York, NY: Guilford.

Yu, R., Geddes, J. R., & Fazel, S. (2012). Personality disorders, violence and antisocial behavior: A systematic review and meta-regression analyses. *Journal of Personality Disorders, 26*, 775–792. https://doi.org/10.1521/pedi.2012.26.5.775

APPENDIX: CHANGE OVER TIME IN THE OUTCOME MEASURES IN TREATMENT AND CONTROL GROUPS BY PERSONALITY PATHOLOGY PROFILES

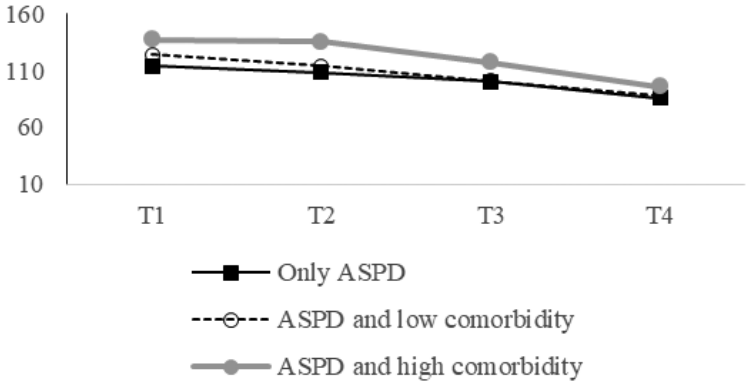

FIGURE A1. Change over time in maladaptive cognitive processes in the treatment group by personality pathology profiles.

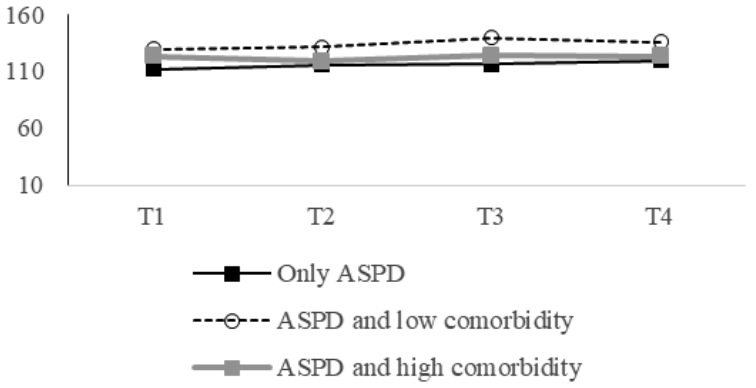

FIGURE A2. Change over time in maladaptive cognitive processes in the control group by personality pathology profiles.

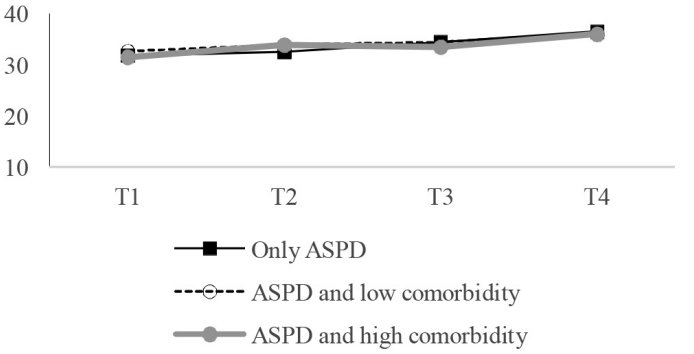

FIGURE A3. Change over time in adaptive cognitive processes in the treatment group by personality pathology profiles.

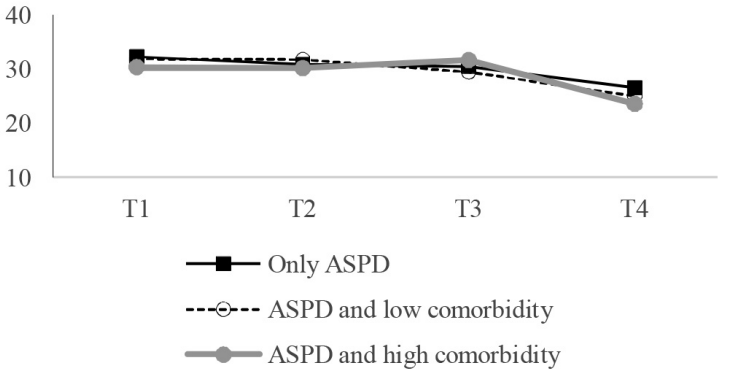

FIGURE A4. Change over time in adaptive cognitive processes in the control group by personality pathology profiles.

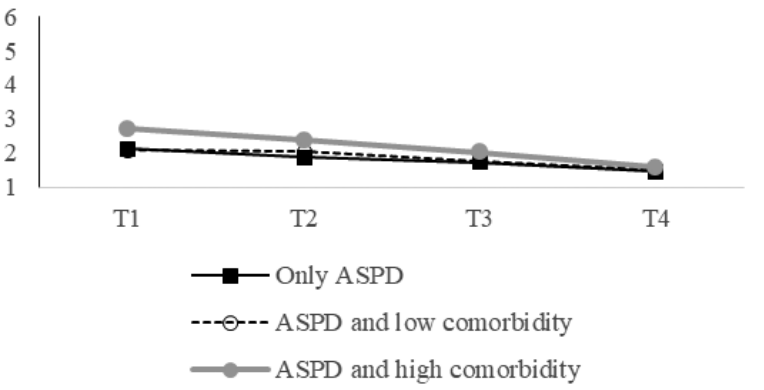

FIGURE A5. Change over time in early maladaptive schemas in the treatment group by personality pathology profiles.

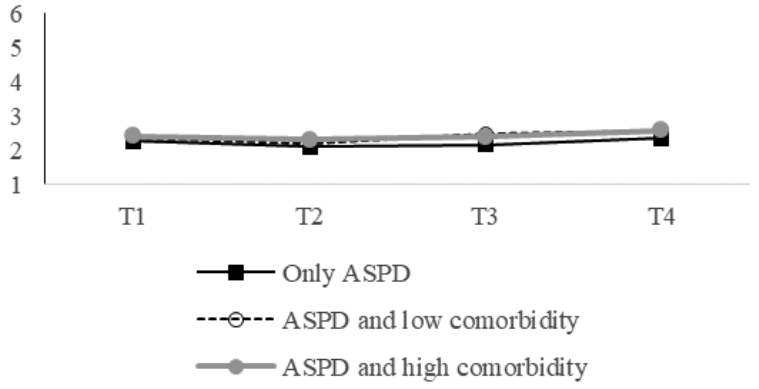

FIGURE A6. Change over time in early maladaptive schemas in the control group by personality pathology profiles.

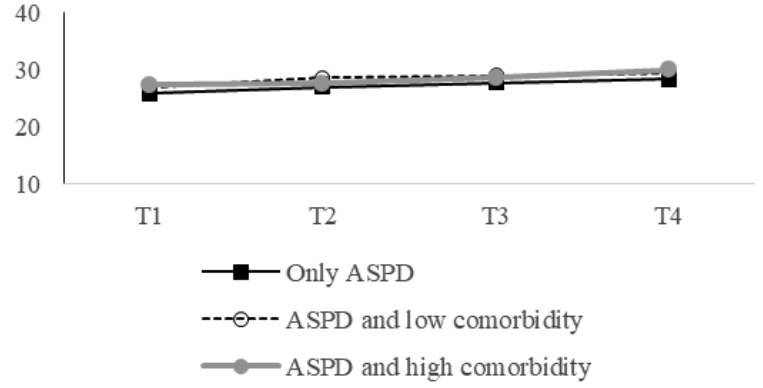

FIGURE A7. Change over time in cognitive reappraisal in the treatment group by personality pathology profiles.

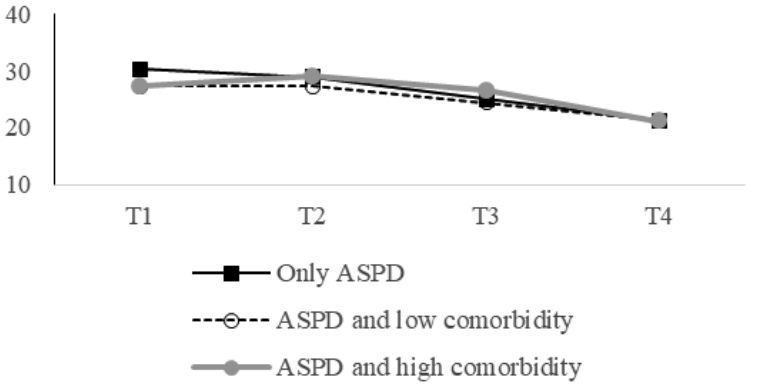

FIGURE A8. Change over time in cognitive reappraisal in the control group by personality pathology profiles.

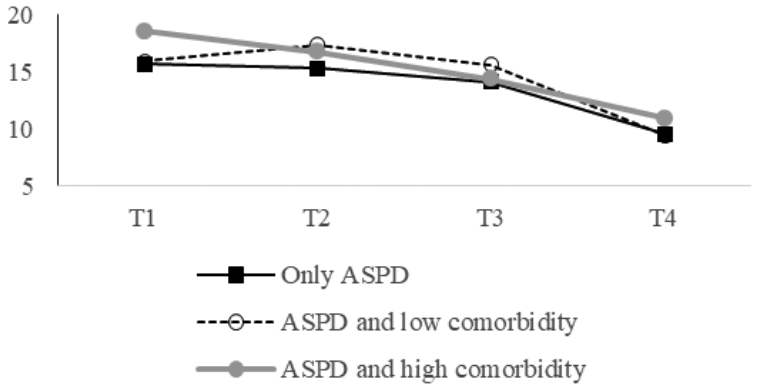

FIGURE A9. Change over time in expressive suppression in the treatment group by personality pathology profiles.

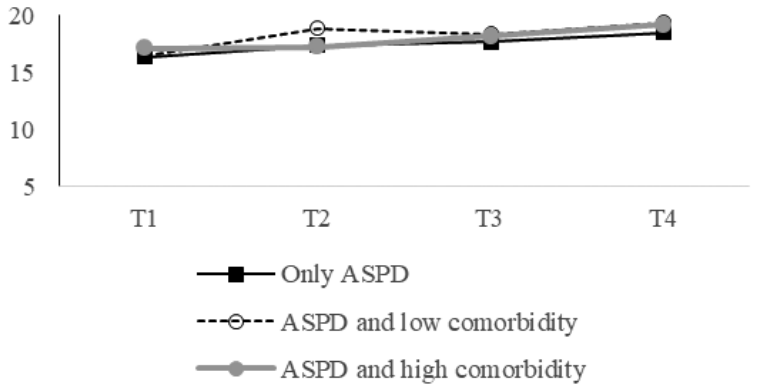

FIGURE A10. Change over time in expressive suppression in the control group by personality pathology profiles.

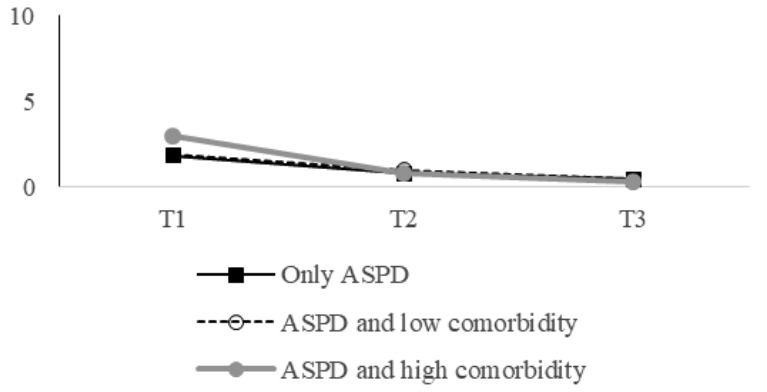

FIGURE A11. Change over time in the number of disciplinary infractions in the treatment group by personality pathology profiles.

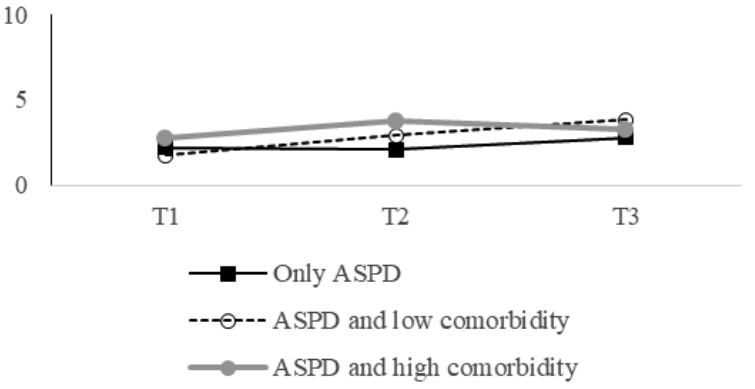

FIGURE A12. Change over time in the number of disciplinary infractions in the control group by personality pathology profiles.

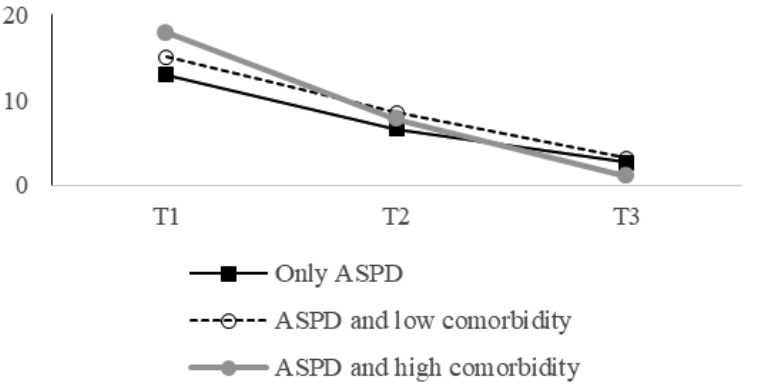

FIGURE A13. Change over time in the number of days in punishment in the treatment group by personality pathology profiles.

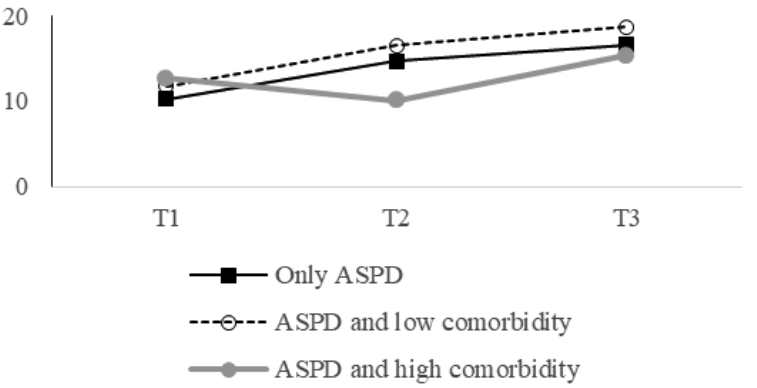

FIGURE A14. Change over time in the number of days in punishment in the control group by personality pathology profiles.