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Clinical Change in Cognitive Distortions and Core Schemas After a Cognitive–Behavioral Group Intervention: Preliminary Findings from a Randomized Trial with Male Prison Inmates

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Abstract

The goal of this pilot study was to assess the efficacy of a cognitive-behavioral program in reducing cognitive distortions and schemas in prison inmates.

The Angry Cognitions Scale and the Young Schema Questionnaire was answered by a treatment and control group, and the treatment effects were tested using ANCOVA with baseline as covariate and condition as fixed factor. In order to assess clinical change, the Reliable Change Index was computed.

At baseline, no differences were found between groups, except for one subscale of the Angry Cognitions Scale (Maladaptive Processes), where controls scored higher than treatment subjects. ANCOVA showed significant differences between groups at post-treatment, with treatment subjects presenting lower scores on the studied variables. Concerning clinical change, differences between groups were observed in the distributions by change categories in the majority of the variables.

These outcomes offer preliminary evidence of the program's ability to change cognitive variables underlying antisocial behavior.

Keywords: Antisocial Behavior; Clinical Change; Cognitive Distortions; Core Schemas; Growing Pro-Social.

Clinical change in cognitive distortions and core schemas after a cognitive-behavioral group intervention: Preliminary findings from a randomized trial with male prison inmates

Structured multimodal programs in a group delivery format have been regarded as the best cost-effective practice for the rehabilitation of adult and young offenders (McGuire, 2006, 2008, 2011, 2013), and are the main form of intervention, both in community and institutional settings. The most disseminated and validated proposals aiming for the reduction of criminal recidivism are structured cognitive-behavioral programs (Andrews & Bonta, 2010a, 2010b; Bogestad, Kettler, & Hagan, 2009; Borum & Verhaagen, 2006; Farrell & Flanner, 2006; Genovés, Morales, & Sánchez-Meca, 2006; Gilbert & Daffern, 2010; Holin, Palmer, & Hatcher, 2013; Lösel, 2001; MacKenzie, 2006; McGuire, 2001; McGuire et al., 2008; Pearson, Lipton, Cleland, & Yee, 2002; Wilson, Bouffard, & MacKenzie, 2005). Research has also pointed out that multimodal group programs, which include a cognitive component, can be twice as effective as those that do not (Bogestad et al., 2009; Gendreau & Andrews, 1990; Hollin et al., 2013; Izzo & Ross, 1990; Pearson et al., 2002; Wilson et al., 2005).

In forensic settings, most rehabilitation programs are designed to have an impact in social information processing associated with offensive behavior. Among the most disseminated programs used in the rehabilitation of inmates are the Reasoning and Rehabilitation (R&R; Ross, Fabiano, & Ross, 1989) and the Enhanced Thinking Skills (ETS; Clark, 2000), both having a good evidence base (Cullen et al., 2012; McDougal, Perry, Clarbour, Bowles, & Worthy, 2009). These programs are based on the cognitive-behavioral approach, and include a large number of sessions aiming for the development of different skills, such as: problem solving, assertiveness skills, social skills, negotiation skills, creative thinking, emotion management, values reasoning,

and critical reasoning. The promotion of these skills is essential for the modification of self – serving cognitive distortions, which is these programs' main goal.

The role of social cognitive biases and dysfunctional cognitions in aggressive and conduct-disordered boys has been widely described in the social information processing theory by Dodge and colleagues (Crick & Dodge, 1994, 1996; Dodge, 1993; Dodge & Schwartz, 1997; Huesmann & Guerra, 1997; Lochman, Wayland, & White, 1993; Quiggle, Garber, Panak, & Dodge, 1992; Zeli, Dodge, Lochman, & Laird, 1999). According to these authors, aggressive children have a tendency to attribute hostile intent to others under circumstances of ambiguous cues. Thus, the likelihood of being aggressive partially depends on the child's social information processing. Dodge and colleagues' five-step model (e.g., Dodge & Schwartz, 1997) proposes that children first encode and then interpret cues; highly aggressive youth may attribute hostile intent to peers and selectively interpret cues that support that hostile attribution bias. The next steps include response access or construction, response evaluation and decision, and behavior enactment; for aggressive children with a hostile bias, the response is often aggressive (in accordance with the hostile view of others). In line with Dodge and colleagues' work, Walters (1990, 1995, 2005, 2007) proposes that criminal behavior results from a life pattern characterized by irresponsibility, self-indulgence, interpersonal intrusion, and social rule-breaking, which is maintained by eight criminal thinking styles: mollification, cutoff, entitlement, power orientation, sentimentality, superoptimism, cognitive-indulgence and discontinuity (for a definition of each one of these thinking styles, see Walters, 1990). From a cognitive perspective, these criminal thinking styles could be conceptualized as cognitive distortions that offenders use when processing information, in order to justify their criminal conduct and/or to minimize the

consequences of their own behavior. According to this perspective, cognitive distortions should be selected as targets for change when intervening with offenders.

Other studies also suggest that specific core beliefs or schemas play a major role in the onset and maintenance of antisocial behavior (Ball & Cecero, 2001; Calvete, 2008; Chakhssi, Bernstein, & de Ruiter, 2012; Gilbert & Daffern, 2013; Jovev & Jackson, 2004; Nordahl, Holthe, & Haugum, 2005; Petrocelli, Glaser, Calhoun, & Campbell, 2001). Early Maladaptive Schemas – EMSs (Rafaeli, Bernstein, & Young, 2011; Young, 1990; Young, Beck, & Weinberger, 1993; Young & Lindemman, 1992; Young & Klosko, 1994; Young, Klosko, & Weishaar, 2003) are core cognitive structures comprising dysfunctional memories, emotions, and cognitions underlying dysfunctional interpersonal patterns and behaviors. EMSs are conceptualized as negative themes about the self and the others, that have their origin in early interactions with significant others, who do not meet the children's core needs (connection, acceptance, autonomy, definition of limits, and safeness). Later in life, EMSs can be triggered in any situation where schema-relevant information is present. Once an EMS is triggered it will guide information processing in a way that maintains and reinforces that same EMS. The core schemas maladaptiveness results not only from the amount of cognitive distortions, when processing the available information, but also from the arousal of intense negative emotional states, and schema-related dysfunctional behavior. One key aspect of EMSs is that they are stable and hard to change, namely due to schema processes: cognitive, emotional and behavioral maintenance, avoidance and overcompensation (for a review, see Young et al., 2003). From this point of view, antisocial behavior can be conceptualized as a result of a distorted view of the self and others, which leads to cognitive distortions in the social information processing. These distortions, in the interpretation of relevant events, facilitate aggression and other antisocial behavioral patterns

(Barriga, Gibbs, Potter, & Liau, 2001; Nas, Brugman, & Koops, 2005, 2008), which, in turn, reinforce and maintain dysfunctional core schemas. In other words, core schemas will give rise to judgments, inferences, and attributions that are consistently biased in an erroneous manner (i.e., they will cause cognitive distortions). For instance, one who endorses a mistrust/abuse schema and believes that others are likely to be hostile is at risk of interpreting an ambiguous interaction as reflecting an aggressive intent (Crick & Dodge, 1994, 1996; Dodge, 1993; Dodge & Schwartz, 1997; Dodge, Lochman, & Laird, 1999), and, consequently, will act in accordance with this misperception (i.e., in an aggressive manner). A considerable amount of research (Ball & Cecero, 2001; Calvete, 2008; Chakhssi, et al., 2012; Gilbert & Daffern, 2013; Jovev & Jackson, 2004; Nordahl et al., 2005; Petrocelli et al., 2001) has demonstrated the association between core schemas and antisocial behavior, and the results have showen a positive association between mistrust/abuse, grandiosity/entitlement and insufficient self-control schemas and antisocial behavior.

Although the link between dysfunctional core beliefs, cognitive distortions and antisocial behavior is known, few intervention programs developed for offenders take into account the need for promoting change at a deeper level, such as dysfunctional core schemas, in order to modify aggressive and antisocial behavior. Most of the programs do not identify what should be the focus of change and what actually causes changes, nor define the relation between the variables that they try to modify during intervention (Rijo & Sousa, 2004; Rijo et al., 2007). For instance, emotional control sessions are carried out if emotional control is totally independent from social reasoning or interpersonal behavior (Brazão, da Motta, & Rijo, 2013). Moreover, most programs tend to use mainly reasoning and school-like activities (e.g., paper and pencil), rather than experiential tasks, which would be more adequate to increase self-knowledge and cognitive

change (Brazão et al., 2013; Rijo et al., 2007). Another frequent misconception in these approaches is the assumption that the majority of antisocial individuals present deficits in social skills. Clinical practice and research have shown that many offenders do not present social deficits (Rijo & Sousa, 2004), and intervention should focus more "(…) on the question of whether certain skills are used, as well as the frequency, context, and purpose with which they are employed" (Brazão et al., 2013, p. 639).

In order to overcome these shortcomings, Rijo and colleagues (2007) developed a new cognitive-behavioral intervention program, the GPS – Growing Pro-Social. GPS's theoretical framework is based on a cognitive-interpersonal perspective (Safran & McMain, 1992; Safran & Segal, 1990; Rafaeli et al., 2011; Young, 1990; Young & Lindemman, 1992; Young & Klosko, 1994; Young et al., 1993; Young et al., 2003), which conceptualizes aggressive behavioral patterns as a result of a distorted view of the self and the others. GPS aims to achieve behavioral change through the promotion of change in cognitive correlates (core schemas, cognitive distortions and cognitive products) of antisocial behavior. The ultimate goal is to reach some degree of change in particular dysfunctional core beliefs, underlying the social information processing of antisocial individuals (Brazão et al., 2013; Rijo et al., 2007): emotional deprivation, abandonment, mistrust/abuse, defectiveness/shame, social isolation/alienation, failure, entitlement, and insufficient self-control (for a description of each of these schemas, see Young et al., 2003). This is accomplished by following a gradual strategy of change which begins by: (1) increasing knowledge about human communication (recognizing the ambiguity of human interactions), (2) changing maladaptive interpersonal behavior patterns, (3) learning about cognitive distortions and trying to counteract them, (4) experiencing and understanding the way emotions work and their influence on behavior and, finally, (5) relating actual problems and

malfunctioning with core schemas and their influence on thoughts, emotions and behavior. This gradual strategy of change requires that the program be delivered in a predefined sequence of five modules, (preceded by an initial session for the presentation of the program): Human Communication (5 sessions), Interpersonal Relationships (10 sessions), Cognitive Distortions (6 sessions), Function and Meaning of Emotions (7 sessions), and Dysfunctional Core Beliefs (10 sessions). GPS ends with a final session, and follow-up sessions can be carried out afterwards.

While Modules 1 and 2 are focused on interpersonal behavior and communication skills, Modules 3, 4 and 5 address cognitive and emotional variables. From the GPS 40 sessions (each lasting 90 minutes), 16 of them are designed to directly address cognitive change; in six of these sessions, participants are encouraged to understand the way our mind processes social information. Common thinking errors (cognitive distortions) are identified, and participants are trained to think in a more realistic way about relevant daily events. In the other 10 sessions, dysfunctional core beliefs, as well as their influence in the attribution of meaning to reality, are identified. Participants are encouraged to fight against their own core beliefs, diminishing the influence these schemas exert on thoughts, emotions and behavior. These sessions usually include experiential tasks, 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 situations (Brazão et al., 2013; Rijo et al., 2007).

The main goal of this pilot study was to test the GPS efficacy in reducing cognitive distortions and specific dysfunctional core beliefs in a sample of male prison inmates. It was expected that, after GPS delivery, treatment group subjects would show a decrease of cognitive distortions in social information processing, as well as less endorsement of the eight core schemas underlying antisocial behavior, when compared to control group subjects.

Method

This exploratory trial was designed in accordance with the CONSORT (Consolidated Standards of Reporting Trials) 2010 Statement guidelines for reporting randomized trials.

Participants

Participants were selected from male prison inmates aged between 19 and 40 years old from three Portuguese prisons. The initial selection of inmates met the following exclusion criteria: (1) presence of cognitive disabilities (given that this kind of intervention is not suitable for the cognitively-impaired) or psychotic symptoms (experiential strategies used in GPS are contraindicated for psychotic patients); (2) being treated for drug abuse/dependence (cessation or at least substantial reduction of drug or alcohol use must precede any attempt to attend GPS sessions); (3) being sentenced exclusively for sexual offenses (sex offenders would benefit from more specific intervention programs); and (4) remaining in prison for at least 12 months (GPS's length), since the beginning of the program.

A sample of 60 male prison inmates, who did not meet the exclusion criteria, was invited to participate. After this first selection, four subjects declined to participate, and 56 inmates were randomly assigned to treatment and control groups. Treatment subjects attended GPS's 40 sessions for 12 months, while the controls did not participate in any kind of program. From the initial 27 treatment group subjects, two dropped out of the program, and one was transferred to another prison during intervention. These three subjects were excluded from further analysis, because it was not possible to obtain post-treatment measures. From the 29 controls, three refused to answer the second evaluation and another two were transferred to another prison. These five subjects were also excluded from analysis.

Groups were compared regarding demographic characteristics, and no significant differences were found (all $p > .24$). In treatment and control groups, the mean age was 27.26 (*SD* = 7.37) and 29.50 (*SD* = 5.83), respectively. Most participants were mostly single (79.17% in treatment group and 75.00% in control group), with a low socioeconomic status (87.50% in treatment group and 100.00% in control group). The groups were also compared concerning legal and criminal sample features, and no significant differences were found (all $p > .11$). In treatment and control groups, the average sentence length was 129.75 months (*SD* = 59.55) and 155.45 months (*SD* = 54.61), respectively. Most participants committed several crimes (54.17% in treatment group and 75.00% in control group) and were first-time offenders (79.17% in treatment group and 75.00% in control group). Crimes for which they were sentenced to prison were predominantly against property, followed by crimes against people, crimes against the State, and drug-related offences.

Measures

Subjects reported on measures of core schemas and cognitive distortions before the start and after the terminus of the program (or the equivalent time interval for the control group). Socio-demographic and legal data on participants were collected from prison staff members.

Young Schema Questionnaire – YSQ-S3 (Young, 2005; Portuguese version by Pinto-Gouveia, Rijo, & Salvador, unpublished): is a widely-used self-report questionnaire including 90 items, measuring the 18 Early Maladaptive Schemas proposed by Young (1990). Each schema is evaluated using a set of five items listed randomly, which the individual rates using a Likert-type scale from 1 (*completely untrue to me)* to 6 (*describes me perfectly*). The YSQ's psychometric properties have been extensively studied by several authors (Schimdt, Joiner, Young, & Telch, 1995; Soygut, Karaosmanoglu, & Çakir, 2009; Stopa, Thorne, Waters, & Preston, 2001; Waller,

Meyer, & Ohanian, 2001). Factor structure and discriminant power between clinical and nonclinical samples have also been studied (e.g., Rijkeboer, Bergh, & Bout, 2005). In Portuguese samples, a structure of 18 factors with moderate item-total correlations and high internal consistency ($\alpha = .97$) was found (Rijo, 2009).

In the present study, only the 8 schemas proposed as underlying antisocial behavior by the GPS theoretical model (Rijo et al., 2007) were taken into account. The total score (resulting from the sum of the 8 schemas) internal consistency was .89. As for the specific schemas, the internal consistency was .83 for Emotional Deprivation, .78 for Abandonment/Instability, .84 for Mistrust/Abuse, .78 for Social Isolation/Alienation, .76 for the Defectiveness/Shame, .81 for the Failure, .89 for the Grandiosity/Entitlement and, finally, .75 for the Insufficient Self Control/Self Discipline.

Angry Cognitions Scale – ACS (Martin & Dahlen, 2007; Portuguese version by Leal, Veloso, Costa, & Simões, unpublished): consists of 54 items distributed across 9 scenarios (e.g., "You get home from the drive-thru and realized that you were given the wrong food"). Participants are asked to imagine that the situation described in each scenario has just happened. For each scenario, there are 6 items referring to different thoughts that could arise during the situation, which can be rated on a 5-point Likert-type scale (*very unlikely* to *very likely*). In each group of items, 5 correspond to Maladaptive Processes addressing 5 information processing errors – Misattributing Causation, Overgeneralization, Inflammatory Labeling, Demandingness and Catastrophic Evaluation (for a definition of each one of these errors, see Martin & Dahlen, 2007). The remaining item in each scenario refers to the Adaptive Processes, which constitutes the second factor of this instrument (Martin & Dahlen, 2007).

The original version of the ACS presented good psychometric properties, with internal consistency values ranging between .82 and .91 for each of the 5 information processing errors subscales, and an alpha of .79 for the subscale corresponding to Adaptive Processes (Martin & Dahlen, 2007). For the psychometric data of the Portuguese version of this instrument, 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, only Adaptive and Maladaptive main factors were taken into account (since the Portuguese version of the instrument could not identify the 5 specific cognitive distortions). The Adaptive Processes factor presented an alpha of .78, and the Maladaptive Processes an alpha of .94.

Interventions

Treatment subjects attended to the GPS program (previously described in the introduction session) for about 12 months, in addition to the Treatment As Usual (TAU) delivered at Portuguese penitentiaries: supervision of school frequency, occupational and job-related tasks and sentence planning supervision over time. Subjects assigned to the control group received TAU and did not attend the GPS sessions or any other program during the research period.

GPS is used in the Portuguese Prison system as a universal delivery program. In this sense, the majority of prison inmates receive the program a few months after prison intake and after the definition of the individual rehabilitation plan, which is done by the case management staff using a motivational approach. Offenders presenting specific criminogenic needs also receive other structured interventions after GPS completion.

Procedures

At each prison, individuals who did not meet the exclusion criteria, were invited to participate in this study. An explanation about the research project and a brief overview of the intervention program were presented and inmates were invited to participate voluntarily. Subjects were then randomly assigned to the treatment or control conditions using a random number table. At a first meeting, prison staff explained the aims of the study to the selected inmates and asked for their informed consent.

Data collection was carried out by psychologists from each prison (not responsible for the GPS delivery) and by the authors of this paper. Subjects in the treatment group were assessed a week before the first session of the program and one week after its terminus; controls were assessed with the same time interval. All treatment completers' attended at least 80% of the GPS sessions (32 or more sessions). Two senior psychologists were chosen to be responsible for the GPS implementation in each prison and, as a way to ensure treatment integrity, all 6 professionals received training and regular supervision in the program's methodology and intervention strategies. The study was approved by the Head of the General Directorship of Social Reinsertion and Prison Services of the Portuguese Ministry of Justice.

Data analysis

Data analysis was carried out in accordance with the Treatment Received (TR) principle, in which outcomes were measured by comparing the outcomes for inmates who completed the program with those in the control group. Both groups were compared at baseline, using independent-samples *t*-tests and the between-group differences in outcome measures at post-treatment were tested using ANCOVA with baseline as covariate and condition as a fixed factor.

Additionally, within-group *t*-tests were performed for each group. All effect sizes were calculated using Cohen's *d*.

In order to evaluate intra-subject clinical change, the Reliable Change Index (RCI; Jacobson & Truax, 1991) was used, which is considered an index with high reliability (Atkins, Bedics, McGlinchey, & Bauchaine, 2005). The RCI was designed to test the efficacy of a particular therapy or program. Instead of focusing on the differences of mean scores, it provides information about treatment effects for each individual, allowing to test whether an individual improves or deteriorates in comparison to baseline (Conboy, 2003). In order to ascertain whether the observed change is in fact genuine and not just due to measurement errors, and whether the change places the individual inside the norms of functional groups (Conboy, 2003), RCI allows the testing of the null hypothesis of no clinically meaningful change, depending on the normal distribution (Maaseen, 2001), and taking into account the measurement error of the instruments (Jacobson & Truax, 1991). This index is computed using the formula: $RCI = \frac{(X\ post - X\ pre)}{\sqrt{2}(\mathrm{SD0} * \sqrt{1 - \alpha})2}$, where *X post* represents the result of the individual in the post-test, *X pre* represents the result of the individual in the pre-test, SD0 represents the standard deviation of the variable in a normal sample, and α represents the internal consistency of the scale in the present sample.

According to Wise (2004), if the RCI scores are greater than 0.84 we can assert, with a confidence interval of 80%, that real, reliable and significant change has been verified; however, if the result exceeds 1.28 or 1.96, that confidence interval increases to 90% and 95%, respectively. On the contrary, if the result is less than -0.84, we can say that deterioration occurred. All values between 0.84 and -0.84 indicate that no change was observed. For the interpretation of the RCI in this study, three broad categories were defined: "Global Improvement" (GI), "Global Deterioration" (GD) and "No Change" (NC). To compare both

groups in the distributions by clinical change categories, Chi-square statistics with Fisher's exact tests with a.05 level of significance was performed. Effect sizes of the differences found in the distributions by clinical change category between groups were calculated with Cramer's *V*.

Results

Baseline differences

Comparisons between groups at baseline for the outcome measures were performed. No significant differences were found between the control and treatment groups at the onset of the study (all $p > .21$), except for one factor of the Angry Cognitions Scale, Maladaptive Processes. In this subscale, the control group had a higher score ($M = 3.06$; $SD = 0.64$) at baseline when compared to the treatment group ($M = 2.71$; $SD = 0.67$), and the effect size of this comparison was moderate ($t = -2.03$; $p = .048$; $d = .59$).

Analysis of covariance

Table 1 presents the analysis of covariance, with baseline as covariate. Regarding the Angry Cognitions Scale, the treatment group had lower scores in Maladaptive Processes at the end of GPS when compared to the control group, which indicates less use of cognitive distortions when processing social information. This difference corresponded to a strong effect. For Adaptive Processes, no differences between groups were found.

Concerning core schemas, and with the exception of the Mistrust/Abuse schema, there were significant differences between groups in the expected direction: treatment group subjects showed lower scores on the majority of specific core beliefs when compared to controls, which

suggests less prominence of these core beliefs in the individuals' self-concept. This same outcome was observed for the total score, with strong effect sizes.

Insert Table 1

Within-group t-tests of changes

Within-group *t*-tests were also carried out in each group (see Table 2). In the treatment group, and concerning the Angry Cognitions Scale, no significant differences between pre-and post-treatment moments were found either for Adaptive or Maladaptive Processes. Regarding core schemas, significant differences were found for Social Isolation and for the total score in the expected direction: subjects showed a significant reduction at post-treatment when compared to baseline. These differences corresponded to moderate effects. For the remaining schemas no significant differences were found between baseline and post-treatment.

In the control group, significant differences were found for Adaptive and Maladaptive Processes, with subjects presenting higher scores at post-treatment when compared to baseline. The observed effect sizes were moderate. These same outcomes were observed for Emotional Deprivation, Defectiveness/Shame, Failure, and Insufficient Self-Control schemas, as well as for the total score. No other differences were found between pre- and post-treatment.

Insert Table 2

Clinical change in adaptive and maladaptive processes, and core schemas after GPS completion

The results obtained for each group in the three possible classes of clinical change in Adaptive and Maladaptive Processes, and core schemas are presented in Table 3. There were no

differences between groups on the distributions by clinical change categories either for Adaptive or Maladaptive Processes. Nevertheless, there was a tendency to a better outcome on Maladaptive Processes in the treatment group subjects while the majority of controls tended to deteriorate in this variable.

Concerning core schemas, the results showed a clear difference between groups on the distributions by clinical change category for the total score. For this variable, improvement in the treatment group was similar to the number of subjects with clinical deterioration on the control group. The observed effect size was strong. Concerning the specific core beliefs, differences between groups on the distributions by clinical change categories were observed for Emotional Deprivation, Defectiveness/Shame, Alienation/Social Isolation, and Failure. In all cases, a high percentage of subjects from the treatment group showed improvements while a high percentage of controls fell into the deterioration category. The effect sizes for these comparisons were strong. No other differences between groups were observed.

Insert Table 3

Discussion

The main goal of this pilot study was to assess GPS efficacy in promoting change in cognitive processes and self-representation (core schemas) in male prison inmates. Differences between mean scores in treatment and control groups at post-treatment were analyzed, as well as within-group comparisons, and special attention was given to clinical change observed in each of the participants. Several authors (Atkins et al., 2005; Conboy, 2003; Jacobson & Truax, 1991: Maaseen, 2001) have argued that significant clinical change should be addressed in the

assessment of any treatment efficacy. Nevertheless, this methodology has been less used in offender's treatment evaluation (Hollin et al., 2013).

At post-treatment, significant differences were found between groups on the maladaptive cognitive processes and on the majority of the specific core beliefs underlying antisocial behavior, with treatment subjects presenting lower scores than control subjects. When looking at within-group comparisons, results suggested that these between-group differences after GPS completion may result not only from the improvement achieved by treatment subjects, but also from the deterioration observed in controls in the majority of the studied variables. Results in the subjects that completed GPS may suggest that this program can be effective in buffering this tendency to worsen over time.

Concerning clinical change, no significant differences between groups in the distributions by clinical change categories were found for Maladaptive or Adaptive Processes. However, there was a tendency for clinical improvement on Maladaptive Processes in a high percentage of the treatment subjects, while the majority of controls presented clinical deterioration. Concerning schema change at a global level, clinical improvement in a high percentage of treatment group participants was observed while, at the same time, a similar number of controls presented clinical deterioration. This finding suggests that GPS can produce changes in self-representation. According to theory (Rafaeli et al., 2011; Young, 1990; Young & Lindemman, 1992; Young & Klosko, 1994; Young et al., 1993; Young, et al., 2003), lower scores on schema measures may be interpreted as a lower prominence of these schemas in the individual's self-concept. In other words, dysfunctional core schemas decrease their influence on associated cognitive distortions and related cognitive products. As a result, attribution of meaning can be made in a more realistic way, less influenced by schema-serving biases. Differences between groups in the distributions

by clinical change categories were found for the Emotional Deprivation, Defectiveness/Shame, Social Isolation and Failure schemas. No significant differences between groups in the distributions by clinical change categories were found for the remaining schemas. As a whole, these are encouraging outcomes, considering the nature of schemas and length of the program. When analyzing clinical change for each of the specific core schemas, a considerable percentage of participants from both groups showed no change between the assessments. When looking at global schema change (total score for the eight EMS) only a small amount of individuals does not change any features of their self-representation themes. Different explanations may contribute to understand these results. One possible explanation may be related to the fact that not every subject is expected to endorse all the eight core schemas (Rijo et al., 2007). Following this idea, GPS efficacy would be related to global schema score rather than specific schemas indicators. Another concurrent explanation for the amount of subjects showing no change between assessments may be related to core beliefs' maintenance processes and resistance to change (Rafaeli et al., 2011; Young, 1990; Young & Lindemman, 1992; Young & Klosko, 1994; Young et al., 1993; Young, et al., 2003). From this point of view, specific schema change would be expected in a certain degree, but not for all the intervened subjects.

Findings presented in this paper offer preliminary evidence of the GPS's efficacy in achieving change at a cognitive level in antisocial individuals, when looking at dysfunctional cognitive processes and/or at underlying core beliefs. If this cognitive malfunctioning can be seen as a correlate of emotional and behavioral regulation problems (Brazão et al., 2013; Rijo et al., 2007), then core schemas should be selected as targets for change, and programs should include cognitive change at this level and not only on cognitive distortions. Furthermore, we can

expect stability of change over time if schema change did occur. Future research should address this issue.

The implications of these results are of considerable relevance to the current practices in the justice system. Most inmates present dysfunctional beliefs and maladaptive cognitive processes that not only lead to severe psychopathology and behavioral problems but are also related with recidivism risk, which should be taken into account in any type of intervention (Constantine, Robst, Ander, & Teague, 2012; Copeland, Miller-Johnson, Keeler, Angold, & Costello, 2007; Martin, Dorken, Wamboldt, & Wootten, 2012; Morgan et al., 2012). Our findings may suggest that these issues may not be effectively addressed by the current practices, as controls showed considerably high clinical deterioration rates in the assessed variables. In contrast, results also suggest that it is possible to obtain considerable gains with structured interventions that consume fewer human and economic resources (Andrews & Bonta, 2010a, 2010b; Bonta & Wormith, 2013; McGuire, 2006, 2008, 2011, 2013; Holin et al., 2013), and that these programs can, at least partially, ensure that subjects in contact with the justice system receive adequate intervention with regards to some of their psychological needs.

Considering that this is a pilot study, generalizations should be carefully addressed and a study replication with a larger sample is required prior to establish GPS efficacy. Further research should assess other relevant variables associated with antisocial behavior (e.g., paranoia, anger, shame), as well as other variables that do not rely exclusively on self-report measures (e.g., behavioral measures, disciplinary incidents and prison records). Mental health disorders should be assessed (especially personality disorders, which are known to be prevalent in prison inmates), and should also be tested as moderators of treatment effects in clinical outcomes. Future studies should take into account the risk profile of the sample, once it may be

an important variable influencing GPS efficacy. The risk profile is also crucial to assess the suitability of the GPS dosage (60 hours). The GPS impact in criminal recidivism is another relevant outcome that future studies should address.

In the current study, the integrity of GPS delivery was ensured by training and supervising senior psychologists who run the program. In future research, more systematic quality control procedures of the program's delivery should be carried out. Because GPS is divided into different modules and is carried out over a considerable period of time, further research should assess if each module may have a particular significant effect in promoting change. Follow-up studies should also focus on possible delayed effects of intervention and the stability of change over time.

Being the first study focusing the GPS impact on promoting change at a cognitive level, results presented and discussed in this paper are encouraging for future research, exploring GPS's effect over relevant dimensions of human functioning, change over time, and criminal recidivism. These outcomes provide preliminary evidence of the program's potential to promote change at a cognitive level, in variables theoretically proposed as underlying antisocial behavior. The cognitive-interpersonal framework from which GPS's contents and methodologies were drawn incorporates recent findings, namely those referring to the core schemas associated with antisocial behavior (Ball & Cecero, 2001; Calvete, 2008; Chakhssi, et al., 2012; Jovev & Jackson, 2004; Nordahl et al., 2005; Petrocelli et al., 2001). In this sense, it offers a different approach to work at a deeper level of cognitive malfunctioning, and, at the same time, it balances the cost-effectiveness by delivering an intervention program in a group format.

Disclosures

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References

Andrews, D. A. & Bonta, J. (2010a). Rehabilitating criminal justice policy and practice. *Psychology, Public Policy and Law, 16,* 39-55.

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

Atkins, C. D., Bedics, J. D., McGlinchey, J. B., & Bauchaine, T. (2005). Assessing clinical significance: Does it matter which method we use? *Journal of Consulting and Clinical Psychology, 73,* 982-989.

Ball, S. A. & Cecero, J. J. (2001). Addicted patients with personality disorders: Traits, schemas, and presenting problems. *Journal of Personality Disorders, 15*, 72-83.

Barriga, A. Q., Gibbs, J. C., Potter, G. B., & Liau, A. K. (2001). *How I Think (HIT) questionnaire manual*. Champaign, IL: Research Press.

Bogestad, A. J., Kettler, R. J., & Hagan, M. P. (2009). Evaluation of a cognitive intervention program for juvenile offenders. *International Journal of Offender Therapy and Comparative Criminology, 54,* 552-565.

Bonta, J. & Wormith, S. (2013). Applying the Risk-Need-Responsivity principles to offender assessment. In L. A. Craig, L. Dixon, & T. A. Gannon (Eds.), *What works in offender rehabilitation: An evidence-based approach to assessment and treatment* (pp. 74-93). Chichester: Wiley-Blackwell.

Borum, R. & Verhaagen, D. A. (2006). *Assessing and managing violence risk in juveniles*. New York, NY: Guilford Press.

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.

Calvete, E. (2008). Justification of violence and grandiosity schemas as predictors of antisocial behavior in adolescents. *Journal of Abnormal Child Psychology, 36,* 1083–1095.

Clark, D. A. (2000). *Theory manual for Enhanced Thinking Skills* (prepared for the Joint Prison Probation Accreditation Panel). London: Home Office.

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.

Conboy, J. (2003). Algumas medidas típicas univariadas da magnitude do efeito [Some typical univariate measures of the effect size]. *Análise Psicológica, 2,* 145-158.

Constantine, R. J., Robst, J., Ander, R., & Teague, G. (2012). The impact of mental health services on arrests of offenders with a serious mental illness. *Law and Human Behavior, 36,* 170-176.

Copeland, W. E., Miller-Johnson S., Keeler, G., Angold, A., & Costello, E. J. (2007). Childhood psychiatric disorders and young adult crime: A prospective, population-based study. *American Journal of Psychiatry, 164,* 1668-1675.

Crick, N. R. & Dodge, K. A. (1994). A review and reformulation of social information-processing mechanisms in children's social adjustment. *Psychological Bulletin, 115*, 74-101.

Crick, N. R. & Dodge, K. A. (1996). Social information-processing mechanisms in reactive and proactive aggression. *Child Development, 67,* 993-1002.

Cullen, A. E., Clarke, A. Y., Kuipers, E., Hodgins, S., Dean, K., & Fathy, T. (2012). A multisite randomized controlled trial of a cognitive skills programme for male mentally disordered offenders: Social cognitive outcomes. *Psychological Medicine, 42*, 557-569.

Dodge, K. A. (1993). Social-cognitive mechanisms in the development of conduct disorder and depression. *Annual Review of Psychology, 44*, 559-584.

Dodge, K. A. & Schwartz, D. (1997). Social information processing mechanisms in aggressive behavior. In D. M. Stoff, J. Breiling, & J. D. Maser (Eds.), *Handbook of antisocial behavior* (pp. 171-180). New York, NY: John Wiley & Sons, Inc.

Farrell, A. D. & Flannery, D. J. (2006). Youth violence prevention: Are we there yet? *Aggression and Violent Behavior, 11*, 138-150.

Gendreau, P. & Andrews, D. A. (1990). Tertiary prevention: What the meta-analyses of the offender treatment literature tell us about "what works". *Canadian Journal of Criminology, 32*, 173-184.

Genovés, V. G., Morales, L. A., & Sánchez-Meca, J. (2006). What works for serious juvenile offenders? A systematic review. *Psicotherma, 18*, 611-619.

Gilbert, F. & Daffern, M. (2010). Integrating contemporary aggression theory with violent offender treatment: How thoroughly do interventions target violent behavior? *Aggression and Violent Behavior, 15*, 167–180.

Gilbert, F. & Daffern, M. (2013). The association between early maladaptive schema and personality disorder traits in an offender population. *Psychology, Crime & Law, 19*, 933-946.

Holin, C. R., Palmer. E. J., & Hatcher, R. M. (2013). Efficacy of correctional cognitive skills programmes. In L. A. Craig, L. Dixon, & T. A. Gannon (Eds.), *What works in offender rehabilitation: An evidence-based approach to assessment and treatment* (pp. 117-128). Chichester: Wiley-Blackwell.

Huesmann, L. R. & Guerra, N. G. (1997). Children's normative beliefs about aggression and aggressive behavior. *Journal of Personality and Social Psychology, 72*, 408-419.

Izzo, R. L. & Ross, R. P. (1990). Treatment programs for offenders: Meta-analysis, "what works" and beyond. *International Journal of Law and Psychiatry, 22*, 361-372.

Jacobson, N. S. & Truax, P. (1991). Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Contemporary Psychotherapy, 39*, 12-19.

Jovev, M. & Jackson, H.J. (2004). Early maladaptive schemas in personality disordered individuals. *Journal of Personality Disorders, 18*, 467‑478.

Leal, J. (2008). *Angry Cognitions Scale: Estudos psicométricos* [Angry Cognitions Scale: Psychometric studies] (Unpublished Master's Thesis). University of Coimbra, Coimbra.

Lochman, J. E., Wayland, K. K., & White, K. J. (1993). Social goals: Relationship to adolescent adjustment and to social problem solving. *Journal of Abnormal Child Psychology, 21*, 135-151.

Lösel, F. (2001). Evaluating the effectiveness of correctional programs: Bridging the gap between research and practice. In G. A. Bernfeld, D. P. Farrington, & A. W. Leschied (Eds.), *Implementing and evaluating effectives programs* (pp. 67-92). Chichester: John Wiley & Sons.

Maaseen, G. (2001). The unreliable change of reliable change indices. *Behaviour Research and Therapy, 39*, 495-498.

MacKenzie, D. L. (2006). *What works in corrections: Reducing the criminal activities of offenders and delinquents.* Cambridge: Cambridge University Press.

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.

Martin, M. S., Dorken, S. K., Wamboldt, A. D., & Wootten, S. E. (2012). Stopping the revolving door: A meta-analysis on the effectiveness of interventions for criminally involved individuals with major mental disorders. *Law and Human Behavior, 36*, 1-12.

McDougall, C., Perry, A. E., Clarbour, J., Bowles, R., Worthy, G. (2009). Evaluation of HM prison service Enhanced Thinking Skills programme: Report on the outcomes from a randomized controlled trial. Ministry of Justice, United Kingdom.

McGuire, J. (2001). What works in correctional intervention? Evidence and practical implications. In G. A. Bernfeld, D. P. Farrington, & A. W. Leschied (Eds.), *Implementing and evaluating effectives programs* (pp. 25-43). Chichester: John Wiley & Sons.

McGuire, J. (2006). Eficácia das intervenções para a redução da reincidência criminal [Effective intervention's for the reduction of offender recidivism] (D. Rijo, Trans.). In A. C. Fonseca, M. Simões, M. C. T. Simões, & M. S. Pinho (Eds.), *Psicologia Forense* (pp.639-665). Coimbra: Nova Almedina.

McGuire, J. (2008). A review of effective interventions for reducing aggression and violence. *Philosophical Transactions of the Royal Society B: Biological Sciences, 363,* 2577-2597.

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 re-offending: 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: Wiley-Blackwell.

McGuire, J., Bilby, C. A. L., Hatcher, R. M., Hollin, C. R., Hounsome, J., & Palmer, E. J. (2008). Evaluation of structured cognitive-behavioral treatment programmes in reducing criminal recidivism. *Journal of Experimental Criminology*, *4*, 21-40.

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.

Nas, C. N., Brugman, D., & Koops, W. (2005). Effects of the EQUIP programme on the moral judgment, cognitive distortions, and social skills of juvenile delinquents. *Psychology, Crime & Law*, *11*, 421-434.

Nas, C. N., Brugman, D., & Koops, W. (2008). Measuring self-serving cognitive distortions with the "How I Think" questionnaire. *European Journal of Psychological Assessment*, *24*, 181-189.

Nordahl, H. M., Holthe, H., & Haugum, J. A. (2005). Early maladaptive schemas in patients with or without personality disorders: Dos schema modification predict symptomatic relief? *Clinical Psychology and Psychotherapy*, *12*, 142‑149.

Pearson, F. S., Lipton, D. S., Cleland, C. M., & Yee, D. S. (2002). The effects of behavioral/cognitive-behavioral programs on recidivism. *Crime and Delinquency*, *48*, 476-496.

Petrocelli, J. V., Glaser, B. A., Calhoun, G. B., & Campbell, L. F. (2001). Early Maladaptive Schemas of Personality Disorder subtypes. *Journal of Personality Disorders, 15*, 546‑559.

Quiggle, N. L., Garber, J., Panak, W. F., & Dodge, K. A. (1992). Social information processing in aggressive and depressed children. *Child Development, 63,* 1305-1320.

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

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.

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

Rijo, D. & Sousa, M. N. (2004). Gerar Percursos Sociais (GPS), um programa de prevenção e reabilitação para jovens com comportamento desviante – bases conceptuais, estrutura e conteúdos [Growing Pro-Social (GPS), an intervention and rehabilitation program for youths with deviant behavior – theoretical framework, structure and contents]. *Infância e Juventude*, *4*, 33-74.

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: EQUAL.

Ross, R. R., Fabiano, E. A., & Ross, B. (1989). *Reasoning and rehabilitation: A handbook for teaching cognitive skills*. Otawa: Cognitive Centre, University of Otawa.

Safran, J. D. & McMain, S. (1992). A cognitive-interpersonal approach to the treatment of personality disorders. *Journal of Cognitive Psychotherapy*, *6*, 59-68.

Safran, J .D. & Segal, Z. V. (1990). *Interpersonal process in cognitive therapy*. New York, NY: Basic Books, Inc.

Schmidt, N. B., Joiner, T. E., Young, J. E., & Telch, M. J. (1995). The Schema Questionnaire: Investigation of psychometric properties and the hierarchical structure of a measure of maladaptive schemas. *Cognitive Therapy and Research, 19,* 295-321.

Soygut, G., Karaosmanoglu, A., & Çakir, Z. (2009). Assessment of early maladaptive schemas: A psychometric study of the Turkish Young Schema Questionnaire-Short Form-3. *Turkish Journal of Psychiatry, 20,* 75-84.

Stopa, L., Thorne, P., Waters, A., & Preston, J. (2001). Are the short and long forms of the Young Schema-Questionnaire comparable and how well does each version predict psychopathology scores? *Journal of Cognitive Psychotherapy, 15,* 253-272.

Waller, G., Meyer, C., & Ohanian, V. (2001). Psychometric properties of the long and short versions of the Young Schema Questionnaire: Core beliefs among bulimic and comparison women. *Cognitive Therapy and Research, 19,* 137-147.

Walters, G. D. (1990). *The criminal lifestyle: Patterns of serious criminal conduct*. Newbury Park, CA: Sage.

Walters, G. D. (1995). The Psychological Inventory of Criminal Thinking Styles: Part I – Reliability and Preliminary Validity. *Criminal Justice and Behavior, 22,* 307-322.

Walters, G. D. (2005). How many factors are there on the PICTS? *Criminal Behavior and Mental Health, 15,* 273-283.

Walters, G. D. (2007). The latent structured of the criminal lifestyle: A taxometric analysis of the lifestyle criminality screening form and Psychological Inventory of Criminal Thinking Styles. *Criminal Justice and Behavior, 34,* 1623-1637.

Wilson, D. B., Bouffard, L. A., & MacKenzie, D. L. (2005). A quantitative review of structured, group-oriented, cognitive-behavioral programs for offenders. *Journal of Criminal Justice and Behavior, 32,* 172-204.

Wise, E. A. (2004). Methods for analyzing psychotherapy outcomes: A review of clinical significance, reliable change, and recommendations for future directions. *Journal of Personality Assessment, 82,* 50-59.

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

Young, J. E. (2005). Young Schema Questionnaire – S3. Cognitive Therapy Center of New York.

Young, J. E., Beck, A. T., & Weinberger, A. (1993). Depression. In Barlow, D. H. (Ed.), *Clinical handbook of psychological disorders* (pp. 240-277). New York, NY: The Guilford Press.

Young, J. E. & Lindemann, M. D. (1992). An integrative schema-focused model for personality disorders. *Journal of Cognitive Psychotherapy, 6,* 11-23.

Young, J. E. & Klosko, J. S. (1994). *Reinventing your life*. New York, NY: Plume.

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

Zeli, A., Dodge, K. A., Lochman, J. E., & Laird, R. D. (1999). The distinction between beliefs legitimizing aggression and deviant processing of social cues: Testing measurement validity and the hypothesis that biased processing mediates the effects of beliefs on aggression. *Journal of Personality and Social Psychology, 77,* 150-166.

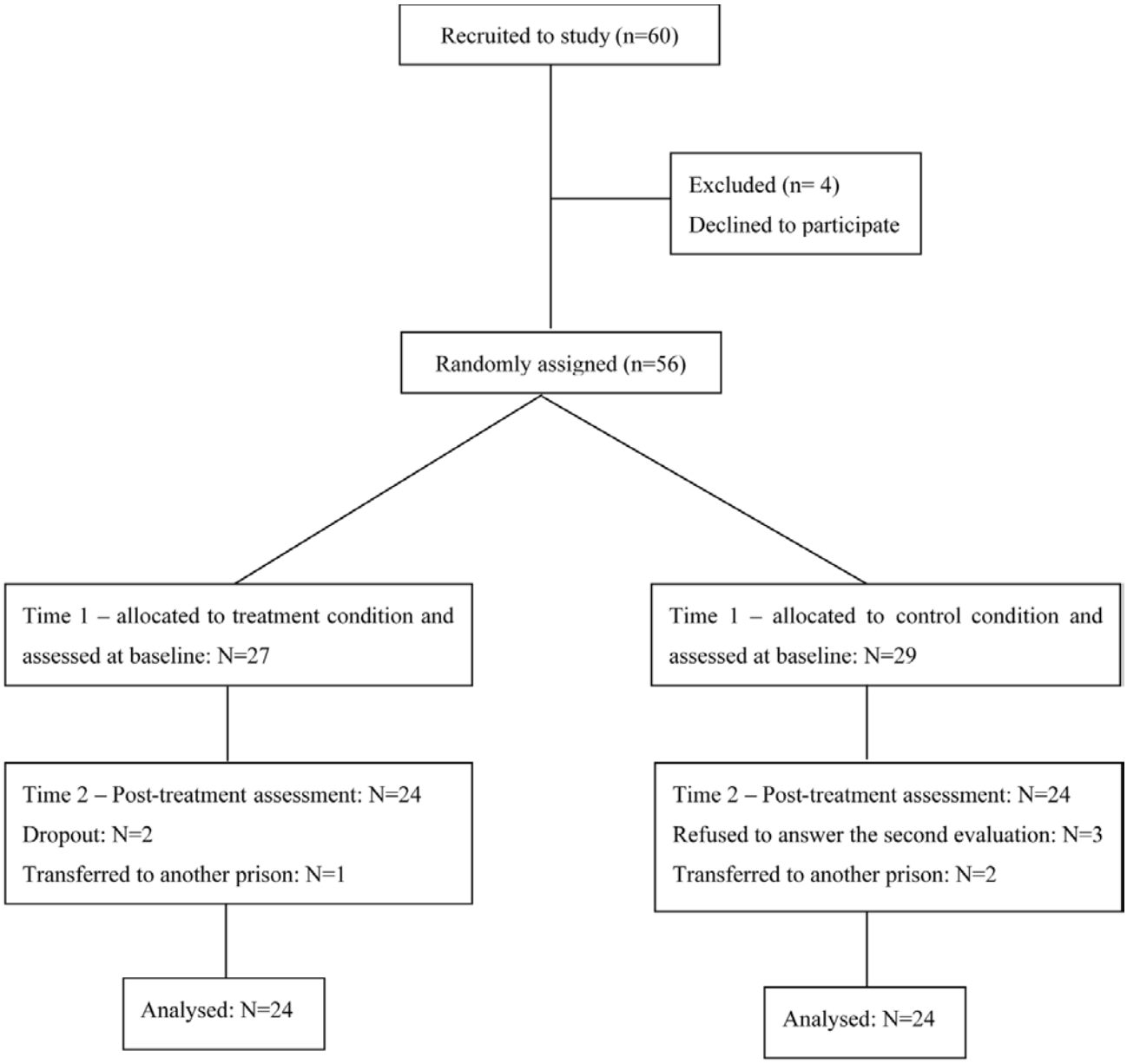

Figure 1. Flowchart of inmate participation

Table 1.

Means and SDs of the Outcome Measures by Group at Post-treatment, and Analysis of Covariance

	Treatment group (N = 24)		Control group (N = 24)		F	p	Cohen's d
	M	*SD*	*M*	*SD*			
Angry Cognitions Scale (ACS)							
Maladaptive Processes	2.48	1.06	3.36	0.50	8.51	.005	1.06
Adaptive Processes	3.81	0.79	4.01	0.60	1.26	.267	0.28
Young Schema Questionnaire (YSQ-S3)							
Emotional Deprivation	1.58	0.84	2.69	1.30	16.47	<.001	1.01
Abandonment/Instability	2.10	0.97	3.14	0.60	15.00	<.001	1.28
Mistrust/Abuse	2.55	1.11	3.05	0.91	2.39	.129	0.49
Social Isolation/Alienation	1.73	0.63	2.68	0.89	17.01	<.001	1.23
Defectiveness/Shame	1.25	0.29	2.30	0.83	32.33	<.001	1.68
Failure	1.32	0.42	2.10	0.86	14.77	<.001	1.15
Grandiosity/Entitlement	2.05	0.75	2.90	0.78	15.00	<.001	1.11
Insufficient Self-Control	1.92	0.72	2.60	0.93	7.86	.007	0.81
Total (8 schemas)	14.53	4.55	21.50	5.15	29.90	<.001	1.43

Note. Maladaptive Processes include Misattributing Causation, Overgeneralization, Inflammatory Labeling, Demandingness, and Catastrophic Evaluations cognitive distortions.

Table 2.

Within-Group t-Tests for Treatment and Control Groups

	Treatment group (N = 24)							Control group (N = 24)						
	Pre-treatment		*Post-treatment*		*t*	*p*	*Cohen's d*	*Pre-treatment*		*Post-treatment*		*t*	*p*	*Cohen's d*
	M	*SD*	*M*	*SD*				*M*	*SD*	*M*	*SD*			
Angry Cognitions Scale (ACS)														
Adaptive Processes	3.72	0.64	3.81	0.79	-0.54	.591	0.12	3.62	0.67	4.01	0.60	-2.36	.027	0.61
Maladaptive Processes	2.71	0.54	2.48	1.06	1.29	.209	0.27	3.06	0.64	3.36	0.50	-2.47	.021	0.52
Young Schema Questionnaire (YSQ-S3)														
Emotional Deprivation	1.87	1.16	1.58	0.84	1.54	.135	0.28	2.00	1.23	2.69	1.30	-3.02	.006	0.54
Abandonment/Instability	2.63	0.96	2.10	0.97	2.00	.057	0.54	3.23	1.29	3.14	0.60	0.39	.696	0.08
Mistrust/Abuse	2.61	0.83	2.55	1.11	0.31	.754	0.06	2.82	1.08	3.05	0.91	-1.51	.142	0.23
Social Isolation/Alienation	2.09	0.76	1.73	0.63	2.29	.032	0.51	2.31	0.97	2.68	0.89	-1.70	.101	0.39
Defectiveness/Shame	1.55	0.74	1.25	0.29	2.00	.054	0.53	1.74	1.05	2.30	0.83	-2.41	.024	0.59
Failure	1.45	0.46	1.32	0.42	1.25	.221	0.29	1.62	0.66	2.10	0.86	-2.91	.008	0.62
Grandiosity/Entitlement	2.45	0.77	2.05	0.75	2.01	.056	0.52	2.49	0.99	2.90	0.78	-1.79	.090	0.46
Insufficient Self-Control	2.04	0.82	1.92	0.72	0.62	.540	0.15	2.14	0.72	2.60	0.93	-2.36	.027	0.55
Total (8 schemas)	16.71	4.46	14.53	4.55	2.07	.049	0.48	18.38	5.81	21.50	5.15	-3.52	.002	0.56

Note. Maladaptive Processes include Misattributing Causation, Overgeneralization, Inflammatory Labeling, Demandingness, and Catastrophic Evaluations cognitive distortions.

Table 3.

Reliable Change Index for the Adaptive and Maladaptive Processes, and for the 8 EMS Underlying Antisocial Behavior as Hypothesized by the GPS Theoretical Model

	Categories	Treatment group *(N = 24)*		Control group *(N = 24)*		*F*	*p*	*Cramer's V*
		n	%	*n*	%			
Angry Cognitions Scale								
Adaptive Processes	GI	5	20.83	10	41.67	2.75	.29	.24
	NC	13	54.17	11	45.83			
	GD	6	25.00	3	12.50			
Maladaptive Processes[a]	GI	11	45.83	4	16.67	5.51	.058	.34
	NC	6	25.00	6	25.00			
	GD	7	29.17	14	58.33			
Schema Questionnaire								
Abandonment/Instability	GI	9	37.50	7	29.17	0.47	.864	.09
	NC	11	45.83	12	50.00			
	GD	4	16.67	5	20.83			
Mistrust/Abuse	GI	8	33.33	3	12.50	3.05	.250	.25
	NC	8	33.33	12	50.00			
	GD	8	33.33	9	37.50			
Emotional Deprivation	GI	8	33.33	2	8.33	10.57	.004	.46
	NC	13	54.17	9	37.50			
	GD	3	12.50	13	54.17			
Defectiveness/Shame	GI	6	25.00	4	16.67	15.57	<.001	.55
	NC	17	70.83	7	29.17			
	GD	1	4.17	13	54.17			
Social Isolation/Alienation	GI	9	37.50	1	4.17	8.59	.015	.42
	NC	12	50.00	16	66.67			
	GD	3	12.50	7	29.17			
Failure	GI	6	25.00	2	8.33	9.09	.011	.43
	NC	16	66.67	11	45.83			
	GD	2	8.33	11	45.83			
Grandiosity/Entitlement	GI	11	45.83	5	20.83	5.09	.076	.32
	NC	8	33.33	7	29.17			
	GD	5	20.83	12	50.00			
Insufficient Self Control/Self Discipline	GI	8	33.33	6	25.00	3.14	.227	.25
	NC	9	37.50	7	29.17			
	GD	7	29.17	11	45.83			
Total (8 schemas)	GI	15	62.50	5	20.83	10.27	.005	.46
	NC	1	4.17	4	16.67			
	GD	8	33.33	15	62.50			

Note. GI = Global Improvement; NC = No Change; GD = Global Deterioration.

Maladaptive Processes include Misattributing Causation, Overgeneralization, Inflammatory Labeling, Demandingness, and Catastrophic Evaluations cognitive distortions.