ORIGINAL ARTICLE

Two clusters of child molesters based on impulsiveness

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Objective: High impulsiveness is a general problem that affects most criminal offenders and is associated with greater recidivism risk. A cluster analysis of impulsiveness measured by the Barratt Impulsiveness Scale - Version 11 (BIS-11) was performed on a sample of hands-on child molesters.
Methods: The sample consisted of 208 child molesters enrolled in two different sectional studies carried out in São Paulo, Brazil. Using three factors from the BIS-11, a *k*-means cluster analysis was performed using the average silhouette width to determine cluster number. Direct logistic regression was performed to analyze the association of criminological and clinical features with the resulting clusters.
Results: Two clusters were delineated. The cluster characterized by higher impulsiveness showed higher scores on the Sexual Screening for Pedophilic Interests (SSPI), Static-99, and Sexual Addiction Screening Test.
Conclusions: Given that child molesters are an extremely heterogeneous population, the ''number of victims'' item of the SSPI should call attention to those offenders with the highest motor, attentional, and non-planning impulsiveness. Our findings could have implications in terms of differences in therapeutic management for these two groups, with the most impulsive cluster benefitting from psychosocial strategies combined with pharmacological interventions.

Keywords: Child molesters; pedophilia; impulsiveness; cluster analysis

Introduction

Given the heterogeneity of child molesters, many taxonomic systems have been developed to facilitate assessment, treatment, and management of this complex population. Child molesters have been assigned to different groups or types on the basis of aggressiveness and impulsiveness levels,[1] primary sexual interest in children,[2] level of social competence, amount of contact with children,[3] presence of psychopathy,[4] resultant victim death,[5] combined psychometric features,[6] severity of alcohol dependence, and substance use problems,[7] among other factors. All of these classifications are relevant insofar as they allow clinicians and criminologists to evaluate sexual offenders from different perspectives.

In addition to these myriad existing typologies, child molesters may encompass individuals with and without a pedophilia diagnosis. Studies have shown that these two subtypes differ in terms of clinical presentation and offending patterns, with pedophiles having more victims and a higher recidivism rate.[8] Additionally, pedophilic child molesters tend to have slower processing speed and lower psychopathic tendencies but better semantic knowledge than do non-pedophilic offenders.[2] Some authors have also hypothesized that pedophilia may be an impulsive

disorder,[9] suggesting that brain regions responsible for weighing the consequences of behavior, sensitivity to punishment, and behavioral inhibition are less active in pedophiles than in normal people. However, contrary evidence showing that non-pedophilic child molesters are more impulsive than are pedophilic offenders also exists.[10] Nevertheless, if an individual (independent of the presence of pedophilia) commits a sexual crime in a society where regulatory laws are present and respected, he/she likely has difficulty controlling his/her impulses, is poor at rationally evaluating what is in his/her own best interests, and acts in accordance with these poor evaluations. Additionally, one study has shown that higher levels of impulsiveness are associated with a larger number of victims.[11] In fact, one characteristic of impulsiveness is the lack of sensitivity to punishment, manifested as the recurrence of disastrous behaviors despite existing rules and laws.[12]

According to the DSM-V,[13] some factors, such as comorbid Axis I disorders and impulsive control disorders, may better characterize individuals with a pedophilic disorder.[14] In addition to the DSM criteria, additional tools are available to investigate pedophilic sexual interests and help distinguish pedophilic from non-pedophilic child molesters. This can include phallometric testing[15] and the Screening Scale for Pedophilic Interests (SSPI).[16] The SSPI has been shown to be positively and significantly associated with phallometrically measured sexual arousal toward children and can be useful for clinical screening and research purposes in countries where phallometric testing is unavailable or even forbidden. This instrument evaluates

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the victim's age and gender, number of victims, and the relationship between the victim and offender.

Impulsiveness has been regarded as a general problem that affects many types of offenders. In fact, impulsiveness can involve a persistent tendency to break rules, engage in irresponsible and antisocial acts, abuse alcohol and other drugs, and have problems in school, and is considered an important predicting factor of re-offense among sex offenders and criminals. In addition, deficits in impulse control are associated with younger age.[17] Although impulsiveness is usually measured by Factor 2 of the Hare Psychopathy Checklist, Revised (PCL-R)[18] in studies of offenders, some authors suggest that self-report instruments, such as the Barratt Impulsiveness Scale (BIS-11),[19] might also be useful in assessing this domain.[20] The BIS-11 has a long history and has undergone multiple revisions. In addition to providing an overall impulsiveness score, the BIS provides scores on three factors: the "attention" factor reflects poor concentration and thought intrusions; the "motor" factor reflects acting without thinking; and the "non-planning" factor reflects a lack of future planning. Although the BIS total score is positively correlated with Factor 2 of the PCL-R,[21] the overall PCL-R score seems to be poorly, but positively, correlated with the BIS total score.[22] All BIS factors are positively correlated with Factor 2 of the PCL-R, although these correlations are only significant for the "motor" and "non-planning" factors.[21]

In the present study, a cluster analysis based on impulsiveness as measured by the BIS-11 was performed in a sample of hands-on child molesters. Our aim was to delineate different clusters of child molesters based on impulsiveness and investigate if these clusters show differences in terms of sociodemographic and some criminological and psychometric features. Based on the literature on impulsiveness and criminal behavior, we hypothesized that the most impulsive subgroup would show a higher number of victims and, consequently, higher SSPI mean scores.

Methods

Databases from two cross-sectional studies were pooled for a joint analysis. Both studies were performed to evaluate sociodemographic, clinical, and psychometric characteristics of sexual offenders. We combined the databases from: a) a study of sexual offenders serving a sentence in the Penitentiary of Sorocaba, state of São Paulo, Brazil;[23] and b) a study performed at the Sexual Disorders Outpatient Clinic (ABSex) of ABC Medical School, Santo André, state of São Paulo, with individuals who committed a sexual offense but had not been convicted at the time of data collection.

Participants

Only male subjects over 18 years old who had committed a sexual offense against children aged 14 years or younger were investigated. Regarding the incarcerated participants, we only included those serving a sentence for sexual crimes so as to avoid the influence of other motivations for

criminal behavior on the results. The study involving incarcerated sex offenders was approved by the Universidade de São Paulo Medical School Ethics Committee, and the study involving non-incarcerated sexual offenders was approved by the ABC Medical School Ethics Committee. All participants provided informed consent.

Of the incarcerated participants, five refused to take part in this study, five were released on parole before our evaluation, and one subject, who was blind, was excluded for being unable to sign the consent form. No participant under treatment at the ABSex refused to participate in this study.

Sexual crimes were defined as statutory rape (the crime of having sexual intercourse with a child under 14 years old) or aggravated indecent assault (lewd acts committed against children under 14 years old).

All information regarding the number of victims of each participant was self-reported and subsequently compared with official records whenever available. The Penitentiary Council of the State of São Paulo and the State Department for Penitentiary Administration (Secretaria da Administração Penitenciária, SAP) provided access to the penitentiary.

Procedure

All interviews were conducted in a private room; each lasted between 90 and 120 minutes. Interviewers offered participants the opportunity to discuss the results of their assessment. Specially trained and clinically experienced interviewers, supervised by the first author of this manuscript, conducted all interviews.

Measures

Participant information was gathered through face-to-face interviews during which the following validated instruments were administered.

Cut down-Annoyed-Guilty-Eye opener (CAGE)

The CAGE was originally developed to briefly screen for clinically significant alcohol problems in many different settings. The CAGE contains four yes/no items that can be administered in a self-report or clinical-interview format. A score of 2 or higher is considered clinically relevant and might indicate the presence of an alcohol-related problem.[24]

Drug Abuse Screening Test (DAST)

The DAST is a quantitative self-report instrument for use in clinical and nonclinical settings to detect misuse of a range of psychoactive drugs. The original version contains 28 yes/no questions; a cutoff score of $\geqslant$ 6 (total score range, 0-28) indicates a probable drug-use problem.[25] A cutoff score of 6 or 7 has a sensitivity of 0.96 and a specificity of 0.85. The DAST has been translated into Portuguese for administration to Brazilian adults.[11]

Barratt Impulsiveness Scale - Version 11 (BIS-11)

This self-report scale evaluates overall impulsiveness with three subscales that measure attention, lack of planning,

and motor impulsiveness. A total of 30 items are scored on a Likert scale. Scores range from 30 to 120, and there is no established cutoff value. This scale has also been adapted for use with Brazilian adults.[26]

Sexual Addiction Screening Test (SAST)

The SAST was developed to assess sexually compulsive or addictive behaviors. The SAST contains 25 yes/no questions; a cutoff score of $\geqslant 6$ (score range: 0-25) indicates a probable addiction to sex. This scale has also been validated in Brazil.[27]

Screening Scale for Pedophilic Interests (SSPI)

This is a brief screening instrument based on static offense variables. This scale includes four items: a) presence of a male victim; b) more than one victim; c) victim is 11 years old or younger; and d) victim is unrelated to the offender. The SSPI items are scored as being present or absent according to information about child victims. For each item, except for the presence of a male victim, an affirmative answer receives a score of 1. For the item "presence of a male victim," an affirmative answer receives a score of 2.[28]

Static-99

This is a brief actuarial instrument created to estimate the probability of sexual and violent recidivism among adult males who have already committed at least one sexual offense against a child or non-consenting adult. This scale contains 10 items, and the minimum information required for scoring the Static-99 is the preexisting relationship between the victim and the offender.[29]

These instruments were chosen for their ability to assess symptoms and their theoretical and empirical support. In general, these measures are brief and easy to administer, score, interpret, and understand; they also have adequate psychometric properties.

We also applied a structured questionnaire developed by ABSex and designed to collect information on the following topics: sociodemographic data, personal history of alcohol and drug use, history of childhood sexual abuse, employment history, reason for current imprisonment, previous convictions or charges, alcohol and other drug use at the time the sexual offense was committed, and relationship between offender and victim.[11] A related victim was defined as someone with whom a relationship would be sufficiently close that marriage would normally be prohibited. To determine whether step relations should be regarded as related or not, we took into account the nature and length of the preexisting relationship between the offender and the victim. When such relationships lasted more than 2 years (e.g., stepcousins, stepchildren), offender and victim were considered related.[29]

Analysis

Participants were divided into homogeneous groups on the basis of a *k*-means cluster analysis. The most important theoretical premise underlying the use of a cluster analysis is based on "type" as a syndrome that includes a set of simultaneous characteristics. The average silhouette width was used to decide the number of clusters. The cluster analysis was based on participants' scores on the three BIS-11 subscales: motor, attentional/cognitive, and non-planning impulsiveness.

The resulting clusters were compared regarding psychosocial, criminological, and psychometric variables. Subsequently, a logistic regression analysis was performed using simultaneous forced entry. Only the independent variables with $p < 0.15$ on univariate analyses were retained in this model. Statistical analyses were performed with SPSS version 20.0. For all statistical tests, differences among groups were accepted as significant if they achieved a 0.05 level with two-tailed tests.

Results

Descriptive statistics

Overall, 208 male participants were included in this study. One hundred forty-nine (71.6%) participants were serving a sentence in the penitentiary, and 59 (28.4%) were undergoing treatment at ABSex. The mean age of our sample was 37.3±14.4 years, 62.5% were single, 76.4% were white, and 54.8% had not completed seventh grade. The mean monthly income before penalty (in Brazilian reais) was R$ 719.80±1,513.30, which corresponds to approximately US$ 313. Forty-one (19.7%) subjects reported a history of being sexually abused in childhood. Seventy-nine (38%) participants offended related victims. Among these, 31 (14.9%) offended their stepdaughters; 12 (5.8%), their stepsons; 7 (3.4%), their nieces; 5 (2.4%), their sisters; 4 (1.9%), their granddaughters; 1 (0.5%), his daughter; and 19 (9.1%) offended against more than one of these categories of related victims.

Before cluster analysis, we carried out a correlation analysis between BIS-11 and offender age, which was not significant (r = 0.09, p = 0.17). In addition, the three factors of the BIS-11 were not significantly correlated with offender age (Motor Impulsiveness, r = 0.06, p = 0.42; Attentional Impulsiveness, r = 0.01, p = 0.92; Non-Planning Impulsiveness, r = 0.07, p = 29).

Analysis of typology

The number of clusters was determined by using the silhouette index with Euclidean distance. To assess the separation of the resulting clusters, we created a silhouette plot using the cluster indices output from *k*-means. The silhouette plot displays a measure of how close each point in one cluster is to points in the neighboring clusters. Two clusters generated a silhouette index higher than 0.5, while three and four clusters generated silhouette indices lower than 0.5.

Table 1 shows the effect of dividing the subjects into the two clusters. Unifactorial results of analyses of variance show that the variables, considered independently, significantly distinguished the two clusters. Participants belonging to cluster 1 (n=97) were characterized by higher motor, attentional, and non-planning impulsiveness than those in cluster 2 (n=111).

Table 1 Division of subjects into two clusters (*k*-means method, silhouette index > 0.5)

Types	Motor impulsiveness	Attentional impulsiveness	Non-planning impulsiveness
Type 1 (46.63%; n=97)	23.70±3.05	22.19±2.97	31.70±4.58
Type 2 (53.37%; n=111)	17.45±2.83	17.43±2.92	20.08±3.85
F	233.94*	135.94*	395.10*

* $p < 0.01$.

Characteristics of the two clusters of child molesters

As shown in Table 2, there were no significant differences between clusters in terms of age, marital status, race, educational attainment, history of childhood sexual abuse, monthly income, current incarceration, alcohol and other drug use at the time of the offense, and mean DAST and CAGE scores. Conversely, subjects included in cluster 1 exhibited higher scores on the SSPI (mainly due to a higher number of victims), Static-99, and SAST instruments.

Before logistic regression, we examined correlations between independent variables with $p < 0.15$ on univariate analyses, to avoid multicollinearity. We found a strong correlation ($r > 0.70$) between the SSPI and Static-99 variables. Thus, we tested two models. The model where the SSPI variable was included provided a higher level of predictability than did the model including

the Static-99 variable. Consequently, the SSPI was included in the final model, whereas the Static-99 was not. Subsequently, as illustrated in Table 3, a multivariate adjustment revealed that higher scores on the SSPI increased participants' odds of belonging to cluster 1. In this multivariate analysis, the model was statistically significant ($\chi^2_{(6)} = 20.55$, $p < 0.01$), with a low group membership variance ($R^2 = 0.13$) and an overall predictability of 70%. We also checked model fit by means of the Hosmer-Lemeshow test ($\chi^2_{(8)} = 4.18$, $p = 0.84$).

Discussion

When subjects were divided into two typological groups, higher scores on the three impulsiveness domains measured by the BIS-11 were found to be more characteristic of cluster 1 child molesters than of cluster 2. After controlling

Table 2 Sociodemographic, criminological, and psychometric features of two clusters of child molesters

Variables	Type 1 (n=97)	Type 2 (n=111)	test	p-value
Age	36.99±13.65	37.60±15.09	$t = -0.30$, df = 206	0.76
Marital status			$\chi^2_{(1)} = 3.35$	0.07
Married/common-law	30 (30.93)	48 (43.24)		
Single/separated	67 (69.07)	63 (56.76)		
Race			$\chi^2_{(1)} = 1.59$	0.21
White	78 (80.41)	81 (72.97)		
Nonwhite	19 (19.59)	30 (27.03)		
Educational level			$\chi^2_{(1)} = 2.96$	0.08
⩽ 7th grade	47 (48.45)	67 (60.36)		
⩾ 7th grade	50 (51.55)	44 (39.64)		
History of sexual abuse in childhood	23 (23.71)	18 (16.22)	$\chi^2_{(1)} = 1.84$	0.18
Monthly income*	830.24±2074.21	617.65±661.44	$t = 0.87$, df = 206	0.38
Currently incarcerated	72 (74.23)	77 (69.37)	$\chi^2_{(1)} = 0.60$	0.44
SSPI	3.04±1.49	2.46±1.52	$t = 2.79$, df = 206	< 0.01[†]
Number of victims			$\chi^2_{(2)} = 12.57$	< 0.01[†]
One	51 (52.58)	84 (75.68)		
Two	20 (20.62)	14 (12.61)		
Three or more	26 (26.80)	13 (11.71)		
Age of victim	8.57±3.06	9.35±3.24	$t = -1.79$, df = 206	0.08
Sex of victim			$\chi^2_{(2)} = 2.81$	0.22
Male	49 (50.52)	50 (45.04)		
Female	46 (47.42)	61 (54.96)		
Both	2 (2.06)	0		
Unknown victims	63 (64.95)	66 (59.46)	$\chi^2_{(1)} = 0.66$	0.42
Static-99	2.58±1.77	1.98±1.67	$t = 2.53$, df = 206	0.01[‡]
DAST	3.71±6.82	1.79±4.28	$U = 4887.50$	0.15
CAGE	1.32±1.38	1.06±1.25	$U = 4795.50$	0.16
SAST	6.63±5.58	4.81±4.36	$U = 4401.01$	0.02[‡]
Alcohol use at time of offense	39 (40.21)	36 (32.43)	$\chi^2_{(1)} = 1.36$	0.24
Drug use at time of offense	9 (9.28)	4 (3.04)	$\chi^2_{(1)} = 2.89$	0.09

Data expressed as mean ± standard deviation or n (%).
CAGE = Cut down-Annoyed-Guilty-Eye opener; DAST = Drug Abuse Screening Test; df = degrees of freedom; SAST = Sexual Addiction Screening Test; SSPI = Screening Scale for Pedophilic Interests.
* In Brazilian reais; [†] $p < 0.01$; [‡] $p < 0.05$.

Table 3 Effects of sociodemographic, criminological, and psychometric variables on cluster 1 child molesters

Variables	SE	Wald	df	p-value	OR	95%CI
Marital status						
Married/common-law	0.32	0.59	1	0.44	0.78	0.42-1.46
Single/separated (reference)						
Educational attainment						
$\leqslant$ 7th grade	0.30	1.18	1	0.28	0.72	0.40-1.30
$\geqslant$ 7th grade						
SSPI	0.10	4.87	1	0.03*	1.25	1.02-1.53
DAST	0.03	3.13	1	0.08	1.06	0.99-1.13
SAST	0.03	3.13	1	0.09	1.05	0.99-1.12
Drug use at time of offense	0.76	0.08	1	0.77	1.24	0.28-5.47
Constant	0.42	5.20	1	0.02*	0.39	-

CI = confidence interval; DAST = Drug Abuse Screening Test; df = degrees of freedom; OR = odds ratio; SAST = Sexual Addiction Screening Test; SE = standard error; SSPI = Screening Scale for Pedophilic Interests.
* $p < 0.05$.

for psychosocial, criminological, and psychometric variables, cluster 1 child molesters showed higher scores on the SSPI, SAST, and Static-99. Only SSPI mean scores retained significance on multivariate analysis.

It would be not counterintuitive if the most impulsive group had a significantly greater number of single individuals, with a lower educational level, a higher level of drug problems,[17] and a more frequent history of sexual offenses against younger victims.[11] However, our study was not able to detect statistically significant differences between the two groups regarding these variables; instead, we found only a trend toward significance. A larger sample might have detected such differences; conversely, it is also possible that, given the heterogeneity of child molesters and the multiplicity of components underlying the concept of impulsiveness, other instruments should be used to investigate these differences in our sample.

Nevertheless, our study confirmed our initial hypothesis that a child molester subgroup with the highest impulsiveness levels had the highest SSPI mean score; this was mainly due to individuals in this group having a greater number of victims. Certainly, the BIS-11 does not replace the usefulness of the SSPI, given that these instruments evaluate different constructs. However, the BIS-11 can be used as an adjunctive instrument in research on child molesters. Additionally, given that child molesters are an extremely heterogeneous population, the "number of victims" item of the SSPI should call attention to those offenders with the highest motor, attentional, and non-planning impulsiveness. As the SSPI is an instrument used to evaluate risk of recidivism, higher BIS-11 mean scores may indicate a higher risk of recidivist child molestation.

Impulsiveness may reflect a characteristically impulsive cognitive style or even a personality trait. This could predict vulnerability toward diverse behavioral problems.[12] Likewise, impulsiveness involves multiple components, including rapid responding without thinking, lack of concern for consequences, preference for immediate reinforcement, disregard for rules, proneness to boredom, and failure to inhibit responses. Due to these myriad factors that compose impulsiveness, several existing measures of impulsiveness do not correlate significantly with one another, or show differences in content and convergence. This suggests that each measure is likely investigating different aspects of a multifaceted construct.[30] Additionally, studies using comparable designs have failed to find correspondence between questionnaire and behavioral measures of impulsiveness.[31] Despite the importance of the concept of impulsiveness to sexual offenses, there have been remarkably few studies on impulsiveness among child molesters as measured by the BIS-11. In addition, when impulsiveness has been studied among pedophilic child molesters, findings have been contradictory; this might be due to different instruments investigating different facets of the same construct. Therefore, more than one instrument is likely necessary to measure impulsiveness in this population.[32]

It is important to note that this study did not investigate whether pedophilic child molesters show higher impulsiveness levels than do non-pedophilic child molesters or vice-versa. However, SSPI mean scores sometimes correlate significantly with a diagnosis of pedophilia. Nevertheless, it is possible that different facets of impulsiveness are more prominent in one of the two groups, depending on the measure applied. Moreover, our findings do not disagree with those of prior research showing mixed evidence for the degree of impulsiveness among pedophilic child molesters.[33]

When other measures were used by previous studies, such as the Matching Familiar Figures Test,[34] the Porteus Mazes,[35] and the Delis-Kaplan Executive Function Scale[36] combined with other neuropsychological tests, no evidence was found of higher cognitive impulsiveness among pedophiles.[10,37] Authors have already suggested that the majority of pedophilic acts are premeditated rather than impulsive; however, given that pedophiles are a highly heterogeneous population, impulsiveness levels and other facets might be part of this heterogeneity and should be taken into account.

Actuarial risk scales for sex offenders, such as the Static-99, are used to provide a probabilistic estimate of sexual violence risk over a specified period.[38] Items are empirically derived and selected in accordance with their ability to predict sexual recidivism. Although the SSPI was specifically designed to assess pedophilia, its correlation with the Static-99 and other actuarial instruments, such as the Rapid Risk Assessment for Sexual Offense Recidivism,[39]

is positive, moderate, and significant.[28] In fact, all SSPI items, such as number of victims, presence of a male victim, younger victim, and extra-familiar victim, are associated with the likelihood of sexual reoffending against adults or children.[8] Thus, the significant correlation between the Static-99 and SSPI shown in our study is in line with previous findings.

Our findings could have implications for differential therapeutic management of the groups we found. The more impulsive cluster could benefit from psychosocial strategies combined with pharmacological interventions. In fact, several studies have already shown that neurobiological dysfunctions are associated with impulsive behaviors, and that some medications could be more precisely recommended for certain criminals. Central serotonergic function and impulsive behaviors have an inverse relationship[20,40]; although somewhat speculative, this finding has prompted researchers and clinicians to treat impulsive and aggressive patients with serotonergic drugs or related types of medications. In addition, myriad other neurotransmitter systems seem to be implicated in impulsiveness and warrant greater investigation.[31]

Our study has a number of limitations that must be addressed. First, self-report data were used to measure outcomes. No self-report measure covers the complete range of symptoms described in diagnostic manuals. Issues of compliance, avoidance or denial of information, and anxiety about revealing secrets or making mistakes impair the reliability of self-reporting to varying degrees for different subjects. Another challenge, especially with brief self-report measures, is that while they are easier to use and less likely to cause fatigue or inconsistency in responses, the use of forced-choice categories may simplify answers or distort information obtained along particular choice sets.

Second, when impulsiveness is measured by self-report questionnaires, its meaning can be unclear, given the influence of subjects' insight and self-perceptions. Third, impulsiveness is a multi-dimensional construct that requires several measures to understand all of its possible dimensions. Fourth, this study used a cross-sectional design, which precludes causal inferences. This design only provides information about the frequency and characteristics of a population by furnishing a "snapshot" of the sample at a specific time.

Another limitation was the absence of a recruited control group; comparisons with other offending groups would be particularly interesting. Furthermore, although our study may have adequate external validity, we cannot be sure that our conclusions would apply to people in other geographic locations or at other facilities. The best way to demonstrate the external validity of the present findings is to replicate our results in different populations, places, and periods. Finally, our sample included both child molesters who were serving a criminal sentence and some who were not. Although distinctive psychosocial characteristics can exist between these two groups, our study was not able to detect any significant differences in the variables of interest between incarcerated and non-incarcerated participants.

Future studies are needed to examine whether impulsiveness measured by instruments other than the BIS-11 might generate distinguishing clusters of child molesters and whether the most impulsive group will show higher SSPI scores. The two clusters identified by our study may have different needs, and, independently of incarceration, all child molesters should receive careful medical evaluation. If necessary, treatment should be provided in line with offenders' clinical and criminological characteristics.

Acknowledgements

Disclosure

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