

Identifying Psychological Traits Potentially Sub-serving Aberrant Motivation or Inhibitory Failure in Pedophilic Behavior

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ABSTRACT

Background: This paper presents data from a research program investigating personality traits or childhood historical factors that may contribute to the motivation for or failure to inhibit pedophilic behavior.

Method: The entire sample included 51 male subjects with pedophilic behavior, 53 opiate addicted subjects (69% males), and 84 healthy controls (77% males). Groups were compared on personality traits related to social anxiety/inhibition, impulsivity, propensity for cognitive distortions and psychopathy along with the incidence of sexual abuse in their own childhoods (CSA).

Results: Results supported an increased prevalence of CSA, psychopathic traits and traits related to a propensity for cognitive distortions in the pedophilic group relative to healthy controls. Compared to opiate addicted subjects, pedophilic subjects had higher rates of childhood sexual abuse, more schizoid traits, and lower impulsivity and behavioral psychopathy scores. While the group with pedophilic behavior scored higher than controls on some measures related to social anxiety, they did not differ from the opiate addicted group.

Limitations: Measures relied on self-report and demographic variables varied across groups.

Conclusion: Subjects with pedophilic behavior may show distinct personality and historical traits related to both inhibitory and motivational factors.

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INTRODUCTION

Despite a large number of publications on the topic of pedophilia and sophisticated forensic research, surprisingly little is known about the etiology, development, underlying mechanisms, and/or neurobiology of pedophilia, information which is necessary for maximal clinical effectiveness. Hence, a solid understanding of the psychobiology of pedophilia is critical to inform treatment, prevention and public policy. The purpose of this paper is to present data from a research program studying the psychological correlates of pedophilia. We will first consider pedophilia as a single coherent entity. We will then address the issue of the heterogeneity among pedophilic individuals (1, 2).

The choice of terminology to describe adults who desire, fantasize about or actually engage in sexual activity with children raises a number of complications. The clinical term, pedophilia, is defined in DSM-IV-TR by sexual fantasies, attraction or behavior towards a prepubescent child (generally aged 13 or younger) for at least 6 months (3). While this definition is fairly stringent, it does not distinguish between those who do and do not act on sexual desires towards children and does not pertain to sexual molesters of children who do not meet the 6-month criterion. Thus individuals with pedophilic behavior may not meet DSM-IV TR criteria for pedophilia. In contrast, legal and forensic terms, such as sexual offender or child molester, only pertain to those who have engaged in sexual

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activity with a child and do not reference the core psychological characteristic of sexual attraction to children. As the protection of children from sexual abuse is of utmost social importance, it is necessary for research to cast a net wide enough to incorporate any adult involved with sexual activity with children yet still maintain clarity about diagnostic distinctions. In the present paper, we present data on a sample of adults who have engaged in sexual activity with children and have entered the criminal justice system because of such activity. To underscore the clinical rather than forensic nature of this report and because not all of these subjects necessarily meet DSM-IV-TR criteria for pedophilia, we will refer to our subjects as individuals with pedophilic behavior. Our ultimate goal is to contribute to a comprehensive understanding of pedophilic phenomena, which would hopefully support treatment options for a wider range of individuals with pedophilic inclinations and provide better protection for children and the public at large.

Relatedly, research into pedophilia is complicated by inherent limitations regarding sample selection and confounding variables. Because sexual activity between adults and children is illegal and socially taboo in most countries, pedophilic individuals run considerable legal and social risk by openly discussing their inclinations and behavior. Consequently most research is performed on subjects already in the criminal justice system and is thus confounded by criminality, impulsivity, low SES and other traits associated with the performance and legal consequences of criminal behavior (4, 5). Nonetheless, there is sufficient consistency in the literature to support hypotheses about the psychological correlates of pedophilia.

The key psychological questions pertain to abnormalities of either motivation or inhibition. Impaired motivation has been linked to social anxiety or general interpersonal inhibitions, which make sexual activity with children appear less anxiety provoking or more accessible than such activity with age-appropriate partners (6-8). Additionally, the "abused abuser theory" suggests that pedophiles' own childhood experiences of sexual abuse predispose them towards sexual attraction to children (9). Inhibitory factors include impulsivity, propensity towards cognitive distortions, and psychopathy. Impulsivity impairs inhibition through failure to consider the negative consequences of pleasurable acts. Cognitive distortions allow individuals to distort the implications of their maladaptive behavior (10, 11), and psychopathy reduces inhibitions via inadequate concern for harm done to other people, in this case the child victims.

Within the literature, there are considerable data pointing to elevated levels of social anxiety, poor self-confidence, and other personality traits which might inhibit appropriate sexual relations with adults (9, 12-15). In a study of 40 male pedophilic sex offenders, 43% met criteria for a Cluster C disorder according to the Structured Clinical Interview for DSM-IV Axis II Disorders (12). In a study of 36 patients with compulsive sexual behavior (29% of whom admitted to pedophilia), 19%, 17%, and 28% met Structured Interview for the DSM-III Personality Disorders (SIDP)/SIDP-Revised criteria and 15%, 21%, and 15% met Personality Diagnostic Questionnaire (PDQ)/PDQ-Revised criteria for avoidant, obsessive-compulsive, and passive-aggressive disorders, respectively (13, 16).

Nonetheless, these traits are commonly found within the general, non-pedophilic population and thus are clearly not specific to pedophilia. Moreover, there is a question of the direction of causality, such that the presence of elevated traits related to social anxiety/inhibition does not necessarily support a causative role in the motivation for pedophilic behavior. Narrative data from our own research revealed that some pedophiles turn to children in response to their impaired interpersonal skills while others described intense feelings of shame, low self esteem, and social avoidance as a result of their pedophilic urges.

The abused abuser theory purports that a history of sexual abuse predisposes individuals to pedophilic tendencies. This etiological hypothesis has robust support in the literature. While reports of elevated rates of childhood sexual abuse (CSA) in child molesters are highly consistent (17-19), the incidence reported varies considerably across studies, ranging from as low as 28.6% (20) to as high as 93% (21). Moreover, sexual offenders against children reported a higher rate of CSA than did sexual offenders against older age groups (17, 19, 22) and non-sexual offenders (19). As most of these findings derive from self-report data, we can question whether individuals in the criminal justice system might over-report such histories in an attempt to mitigate their sentences. In a large community sample, however, men with a history of multiple episodes of sexual abuse in their own childhood were almost 40 times more likely to report having engaged in sex with children aged 13 or younger as adults (0.2% vs. 7.7%) (23).

While there is strong evidence of an association between CSA and adult pedophilia, the mechanism behind this relationship is not clear. Proposed mecha-

nisms include a normalization of adult-child sex as well as identification with the aggressor, in which the victim identifies with the powerful aggressor in an attempt to mitigate the experience of helplessness (5, 9, 17). It is also possible that there are neurodevelopmental effects of CSA on sexual development. A growing body of literature documents the neurobiological effects of child trauma, for example on the hippocampus and the HPA axis (see 24 for a review). It is likewise conceivable that sexual trauma or premature sexual stimulation may have enduring effects on sexual neurodevelopment (6, 17). Some evidence of the effect of early sexual experience on sexual brain-behavior relationships has come from rat studies (25). Nonetheless a substantial proportion of pedophilic subjects across studies do not report a history of CSA (5, 18-20, 22). It is possible that the variation in CSA histories among pedophilic samples reflects underlying heterogeneity among individuals with pedophilic behavior, as will be discussed below.

With regard to impulsivity, the literature is somewhat inconclusive. Pedophilia has been conceptualized as a disorder of impulse control (26-28) or impulsive aggression (28). Moreover, high levels of comorbid impulse control disorders have been documented in adult and juvenile pedophile samples (12, 29). However, we found no evidence of cognitive impulsivity on the Matching Familiar Figures Test or the Porteus Mazes (30). In an analysis drawn from the New York Sex Offenders Registry, sexual offenders against children were older and less likely to use force or a weapon than were offenders against either adolescents or adults, suggesting lower levels of impulsive aggression (31). Further, a very old but thorough study showed the vast majority of pedophilic acts (70-85%) to be premeditated rather than impulsive (32). These contradictory findings may also point to heterogeneity among pedophilic individuals.

There is robust evidence in the literature for a tendency towards cognitive distortions among pedophile samples. These mental manipulations serve to justify, minimize or normalize the pedophilic behavior (10, 11). In fact the tendency towards distorted thinking may generalize to the entire personality, such that pedophiles may have elevated levels of schizotypal or other Cluster A personality disorder traits (13, 16, 33).

Elevated levels of psychopathic personality traits have also been widely documented in pedophilic samples (6, 12, 13, 28, 34). However, there is evidence of heterogeneity in this regard as well. For example, a sample of pedophilic priests had lower scores on the MMPI

psychopathic deviate scale compared to a sample of non-clerical pedophiles (5). We can speculate that those pedophiles who act on their urges would have greater levels of psychopathic traits than those who do not.

Thus the literature points to personality traits and/or childhood histories putatively related to disordered motivation and impaired inhibition among pedophilic samples.

We will now present data from our research program comparing social inhibition, child sexual abuse histories, impulsivity, psychopathy and Cluster A personality traits in subjects with pedophilic behavior, healthy controls and individuals with opiate addiction. The first two traits are hypothesized to be associated with the motivation for pedophilic behavior, the last three with the failure to inhibit such behavior. Opiate addicted subjects were selected as a comparison group as we were interested in the notion of pedophilia as a behavioral addiction.

SUBJECTS

Our program comprised several separate studies (cf. 6, 18, 31, 34, 35). Data from two studies, Study 1 and Study 2, are presented here. The combined sample included 51 males with pedophilic behavior recruited from an outpatient clinic specializing in the treatment of sexual offenders, 53 subjects with opiate addiction recruited from a residential treatment center (69% males), and 84 healthy controls recruited from local media advertising (77% males). All subjects with pedophilic behavior admitted to committing and were charged for or convicted of a sexual offense against a child age 13 or younger when the subject was at least 18 years old or at least five years older than the child. Opiate addicted subjects in sustained remission were recruited from the SuCasa methadone to abstinence residential treatment program. All opiate addicted subjects had at least a two-year history of opiate dependence, were abstinent from illicit substances, and had been detoxified from methadone for at least six months. We also administered a urine toxicology test to insure drug abstinence. Healthy controls were recruited from advertising in local New York City newspapers. Exclusion criteria for both the pedophilic group and controls included meeting DSM-IV criteria for a substance-use disorder within six months prior to the study. Exclusion criteria for both the opiate addicted group and controls included history of pedophilia or of sexual activity as an adult with anyone younger than 15, or with anyone at least five years younger than the subject

when the subject was younger than 18. For all subjects any significant Axis I psychiatric disorder other than the index disorder (i.e., opiate addiction or pedophilia), such as Major Depressive Disorder with psychosis, recurrent psychotic disorders, Bipolar Disorder, Obsessive-Compulsive Disorder, or any disorder requiring hospitalization or disability leave, was an exclusion criterion. This study was approved by the Beth Israel Institutional Review Board and all subjects gave written informed consent.

MEASURES

SCID II for DSM-IV (36). This widely used, semi-structured clinical interview provides diagnoses for all DSM-IV axis II personality disorders. There is a 119-item screening questionnaire to be followed up by 119 sets of interview questions. According to the APA Handbook on Psychiatric Instruments (3), the reliability coefficients are comparable to those of other similar interviews. The three Cluster A personality disorders were used as measures of the propensity toward cognitive distortions as a personality trait. The Cluster C disorders were assessed as measures of personality traits related to social anxiety. Passive-Aggressive and Self-Defeating Personality Disorders were also included with these disorders as they had either been in Cluster C in DSM-III-R (Passive-Aggressive) or otherwise involve some degree of self inhibition (Self-Defeating). To maximize sensitivity, the number of criteria for each diagnosis was analyzed rather than categorical diagnosis scores. Although interviewers were closely supervised by the first author (LJC), interrater reliability was not formally assessed.

Millon Clinical Multiaxial Inventory-II (37). This 175-item questionnaire measures DSM-III-R personality disorders as well as several Axis I disorders and syndromes. Dimensional scales from the MCMI-II and a later edition, the MCMI-III, have been well correlated ($r > 0.5$) with related measures from the Symptom Checklist 90 - Revised (SCL-90-R) and the Minnesota Multiphasic Personality Inventory (MMPI) (38). Scale scores were calculated according to the scoring key in the MCMI-II manual (37). No corrections were used in scoring. Scales for Avoidant, Dependent, Obsessive-Compulsive, Passive-Aggressive, and Self-Defeating personality disorders as well as a related axis I disorder (Anxiety Disorder) were used to assess traits related to social anxiety. As above, these personality disorders are referred to as Cluster C disorders. Additionally, MCMI Cluster A and Delusional Disorder scales and Antisocial Personality Disorder scales

were included as measures of propensity for cognitive distortions and psychopathy, respectively.

Temperament and Character Inventory (39). Adapted from the Tridimensional Personality Questionnaire, the 240-item Temperament and Character Inventory (TCI) assesses three dimensions of temperament and three dimensions of character. The internal consistency of the scales ranged from .76 to .87 for the temperament scales and .84 to .89 for the character scales. Principal component analysis identified seven factors accounting for 65% of the variance. The first six factors closely paralleled the rationally defined item loading of the six TCI scales. TCI Novelty Seeking was used as a measure of impulsivity,

Dimensional Assessment of Personality Impairment-Questionnaire (DAPI-Q) (6, 40). The Dimensional Assessment of Personality Impairment-Questionnaire (DAPI-Q) is a 248-item questionnaire that measures personality impairment in 16 scales grouped into six function clusters: regulation of affect (3 scales), action (2 scales), cognition (2 scales), interpersonal function (4 scales), self-organization (3 scales), and societal function (2 scales). The DAPI-Q has been adapted from the Dimensional Assessment of Personality Impairment, a semi-structured interview (35, 40). Inter-item consistency for the questionnaire items ranged from 0.73 to 0.95 across scales. The DAPI scales differentiated three patient groups (subjects with depression, pedophilia or body dysmorphic disorder) from healthy controls and correlated strongly ($r > .44$) with matched MCMI-2 scales (35, 40, unpublished data). DAPI-Q Impulse control, Self Esteem, Societal Attitudes and Societal Behavior scales were used as measures of impulsivity, social inhibition and psychopathy, respectively.

Barratt Impulsivity Scale (BIS-11) (41). The BIS-11 is a widely used measure of impulsivity. It is a 30-item self-administered questionnaire with three subscales and a total score. Cronbach's alphas ranged from .79 to .83 across several samples. The BIS-11 has been shown to distinguish impulsive aggressive from nonaggressive college students and prisoners from non-inmate controls (42). The total score was used for analysis.

Hare Psychopathy Checklist-Revised (43). PCL-R is a semistructured interview in which 20 items are rated by the clinician to assess psychopathic personality characteristics (factor 1) and socially deviant behaviors (factor 2). The PCL-R is a standard measure of antisocial personality pathology. Intra-class coefficients for reliability range from 0.73 to 0.95 across numerous samples. The PCL-R has shown predictive validity regarding

recidivism after release from prison, construct validity via relations with other measures of psychopathy, and severity of criminal history (38). The factor 1, factor 2, and total scores were used for analysis. Although interviewers were closely supervised by the first author (LJC), inter-rater reliability was not formally assessed.

The Sexual History Questionnaire (18). A detailed 72-item self-report questionnaire assessing childhood sexual experiences, sexual interest, and pedophilic behavior was developed for this study. Sexual age preferences were assessed in a grid-format checklist, with three columns of the grid labeled “sexually attracted to,” “have had sexual encounters with,” and “have had legal trouble for sexual activity with.” The 10 rows included five categories of age groups for first girls and then boys, ranging from infancy through adulthood (18 years or more). Control subjects completed a shortened form, which collapsed the youngest age categories into one category of 12 years and younger. To increase the reliability of subjects’ reported sexual abuse history, childhood sexual history was assessed with multiple questions. At the beginning of the questionnaire, subjects are asked to list the age of their first sexual experience, with whom it occurred, and the age of their first partner. Later in the questionnaire, they are asked a series of questions such as: “When you were a child did any adult ever make sexual advances at you?” and “How old were you when it started?” They are also asked the number of people who made advances toward them, their gender, ages, and whether they were family members. Five primary variables were calculated from the SHQ. The first four variables were 1) age at youngest sexual contact, 2) age of partner at youngest sexual contact, 3) age difference between self and partner at first sexual contact, and 4) whether or not the subject experienced adult sexual advances as a child. The fifth primary variable was the percentage of subjects who reported their first sexual contact at or prior to the age of 13 with a partner who was at least five years older. This final variable was in keeping with the DSM-IV definition of pedophilia. Internal consistency was measured through correlating the key question about adult sexual advances experienced as a child, with the four other variables of interest. Correlations ranged from 0.60 to 0.88. Only variables 3, 4 and 5 are reported here.

The Child Trauma Questionnaire (44). A 28-item, self-report questionnaire, is used to assess five areas of childhood maltreatment: sexual, physical and emotional abuse, as well as physical and emotional neglect. Subjects are asked to rate whether each item is never, rarely, some-

times, often or very often true. This measure has been proven reliable and valid, with evidence of convergent and discriminant validity with structured trauma interviews, stability over time, and concordance with independent data (44). Only the sexual abuse scale is presented here.

Pedophilia Criteria Sheet. Developed for Study 2, this semi-structured interview includes both 32 questions and a narrative record of the subjects’ history of pedophilic behavior. Subjects are asked about age, sex and number of victims, number of acts and the specific circumstances of their sexual activity with children.

STATISTICAL ANALYSIS

All demographic variables that significantly differed across groups and correlated with the dependent variable in question were entered as covariates in group comparisons. MANCOVAs or ANCOVAs with simple contrasts for pairwise comparisons were used to compare continuous data across groups. Chi-square analysis was used to compare groups on categorical variables. Binary logistic regression analysis was used for pairwise comparisons when there were three subject groups or when covariation for demographic variables was needed.

RESULTS

DEMOGRAPHIC DATA

Mean level of education was 12.5 ± 3.6 years for individuals with pedophilic behavior, 12.0 ± 2.6 for individuals with opiate addiction, and 15.4 ± 2.0 for controls. Mean age was 38.6 ± 1.2 for pedophiles, 44.6 ± 6.4 for opiate addicts, and 33.8 ± 9.7 for controls. Individuals with pedophilic behavior were 16.7% African American, 35.4% Caucasian, 41.7% Hispanic, 4.2% Asian and 2.1% other. The ethnic distribution was 36.2%, 27.7%, 34%, 0% and 1% for opiate addicted subjects and 19.7%, 46.1%, 19.7%, 7.9% and 6.6% for healthy controls.

In Study 1 (n=21 individuals with pedophilic behavior, 24 healthy controls), groups did not differ as to education, ethnicity, age or gender. Therefore, none of the demographic variables were entered as covariates in subsequent analyses for Study 1. In Study 2 (n=29 individuals with pedophilic behavior, 53 individuals with opiate addiction, and 60 healthy controls), there were significant differences across groups for age, ethnicity, education and gender. As both sexual history and personality scores were significantly associated with education, and the SCID II Cluster A and Cluster C scores were significantly associated with

both ethnicity and education, these demographic variables were entered as covariates in the relevant analyses.

PEDOPHILIC BEHAVIOR

Data on the first subset of pedophilic subjects ($n=20$) was drawn from the Sexual History Questionnaire. Regarding specific sexual acts, 90% admitted to sexual touching of a child aged 13 or younger, 75% to genital touching and 70% to non-genital touching (15% to non-genital touching only). Ninety percent admitted to legal trouble for sexual behavior with underage individuals, 70% for such behavior with children under 13, 30% with children under 10. Eighty percent admitted to either legal trouble or sexual encounters with girls and 10% to both encounters and legal trouble with boys. As the self-report data was inconsistent (90% listed specific sexual acts with a child under 13 but only 50% admitted to “sexual encounters” with a child under 13), we developed a more detailed interview, the Pedophilia Criteria Sheet, for the second study.

In Study 2 ($n=29$), we utilized a semi-structured interview in order to gain a more fine grained assessment of subjects’ pedophilic behavior. The average age of youngest victim was 9.5 ± 3.2 years. The vast majority of subjects (86%) had only girl victims, 3% had only boy victims and 10% had both boys and girls. Fifty-five percent reported genital touching, 21% non-genital touching, and 24% non-touching offenses. Of the perpetrators with touching offenses, 41% reported 1 victim, 21% 1-5 victims, 3% 10-100 victims and 10% reported over 100 victims.

OPIATE ADDICTION HISTORY

The 51 subjects with opiate addiction reported 17.0 ± 10.3 (mean + s.d.) years of addiction, with a maximum of $\$129.30 \pm \106.71 spent per day on their opiate addiction and 6.8 ± 7.5 years in methadone maintenance treatment before entering the SuCasa methadone to abstinence residential treatment program.

POTENTIALLY MOTIVATING TRAITS

Data comparing subject groups on potentially motivating traits is presented in Table 1. Specifically, Table 1 presents data both on personality traits related to social anxiety and on subjects’ own history of childhood sexual abuse.

Traits related to Social Anxiety. In Study 1 individuals with pedophilic behavior were compared with healthy controls on the MCMI anxiety disorder and five per-

sonality disorder scales (referred to herein as Cluster C). Groups were also compared on the DAPI-Q Impairment of Self Esteem scale. The MCMI Cluster C scales were compared by MANOVA and the other scales by ANOVAs. The omnibus test for MCMI Cluster C disorders was statistically significant as were group differences on three of five scale scores (Passive-Aggressive, Self-Defeating and Avoidant). Groups also significantly differed on the MCMI Anxiety scale and the DAPI-Q Self Esteem scale. In all cases, individuals with pedophilic behavior scored higher than controls (see Table 1).

The SCID II Cluster C results are drawn from Study 2. Although the omnibus test across the three subject groups (pedophilic, opiate addicted and controls) was not statistically significant, there were significant group differences for three out of five individual personality disorder scores, specifically Dependent, Passive-Aggressive and Depressive. By simple contrasts, both the pedophilic and opiate addicted group scored higher than controls on Dependent and the opiate addicted group scored higher than controls on Depressive (see Table 1).

History of Childhood Sexual Abuse (CSA). Results from three variables calculated from the Sexual History Questionnaire and the sexual abuse scale of the Childhood Trauma Questionnaire are also presented in Table 1. Fifty-six percent of the pedophilic group ($n=27$), 32% of the opiate addicted group and 6.6% of the controls admitted to experiencing adult sexual advances as children. The pedophilic group reported a significantly higher incidence of adult sexual advances than either of the other two groups by binary logistic regression covarying for education (AOR=7.06 for P vs. C; 3.34 for P v. OA). Likewise the pedophilic group was significantly more likely to state that their first sexual contact occurred at or before the age of 13 with a partner at least five years older (52.3% vs. 26.1% and 4.9%) (AOR=8.6 for P vs. C; AOR=3.9 for P vs. OA). Furthermore the mean age difference between self and first sexual partner was significantly higher for the pedophilic group than for the control group and marginally higher than the opiate addicted group ($P=11.36 \pm 11.5$; $OA=7.0 \pm 11.4$; $C=2.31 \pm 7.8$). Finally, the pedophilic group scored significantly higher than controls (but not opiate addicted individuals) on the CTQ sexual abuse scale (see Table 1).

POTENTIALLY DISINHIBITING TRAITS

Data comparing subject groups on potentially disinhibiting traits are presented in Table 2. Specifically Table 2

Table 1. Potentially Motivating Traits in Pedophiles, Healthy Controls and Opiate Addicts

Motivating Traits				
	Pedophiles (P)	Healthy Controls (C)	Opiate Addicts (OA)	Statistics
Traits Related to Social Anxiety				
<i>MCMI Cluster C</i>				Hotellings T(5,38) = .341, p = .041
MCMI Avoidant	22.30 ± 16.6	10.38 ± 6.9	---	F(1,43) = 10.23, p = .003
MCMI Passive Aggressive	29.65 ± 17.0	17.25 ± 13.3	---	F(1,43) = 7.35, p = .010
MCMI Self Defeating	21.25 ± 16.4	8.92 ± 8.0	---	F(1,43) = 10.6, p = .002
MCMI Compulsive	37.35 ± 8.1	37.54 ± 7.1	---	NS
MCMI Dependent	27.1 ± 6.7	25.3 ± 5.9	---	NS
MCMI Anxiety Disorder	11.40 ± 12.0	3.25 ± 3.9	---	F(1,43) = 9.48, p = .004
DAPI Self Esteem	1.44 ± 1.1	0.57 ± 0.5	---	F(1,39) = 9.96, p = .003
<i>SCID II Cluster C**</i>	6.34 ± 4.9	2.67 ± 3.4	6.95 ± 5.9	Wilks' λ (10,136) = 0.86, p = .414
SCID II Avoidant	1.31 ± 1.4	0.63 ± 1.4	1.26 ± 1.7	NS
SCID II Dependent	0.79 ± 1.0	0.19 ± 0.4	1.00 ± 1.2	F(4,76) = 3.26, p = .016 OA>C, P>C#
SCID II Obs. Compuls	1.79 ± 1.8	0.89 ± 0.2	1.78 ± 1.3	NS
SCID II Passive Aggressive	1.17 ± 1.6	0.37 ± 0.6	1.09 ± 1.5	F(4,76) = 2.86, p = .029
SCID II Depressive	1.28 ± 1.6	0.59 ± 1.0	1.83 ± 1.6	F(4,76) = 2.79, p = .032 OA>C#
Abused Abuser				
Sexual Advances as Child (SHQ) ^a	27 (56.3%)	4 (6.6%)	8 (32%)	X ² = 32.3, p<.001 P > OA, C
<13, Partner > 5 yrs older (SHQ) ^b	23 (52.3%)	3 (4.9%)	6 (26.1%)	X ² = 4.2, p = .040 P > OA, C
Age Difference with 1st Partner ^c	11.36 ± 11.5	2.31 ± 7.8	7.00 ± 11.4	F(3,117) = 13.8, p = .015 P>C, P> OA#
CTQ Sex Abuse Score*	8.88 ± 5.9	5.97 ± 2.8	7.27 ± 5.5	F(5,92) = 2.95, p = .017 P > C

* Covaried for education ** Covaried for education and ethnicity. # Paired contrasts marginally significant at p<.1.

^a Subject experienced adult sexual advances as a child.

^b Subject was aged 13 or younger and partner 5 or more years older at first sexual contact.

^c Age difference between subject and first sexual partner in years

presents data on impulsivity, propensity for cognitive distortions and psychopathy.

Impulsivity. Impulsivity was measured in Study 1 by the DAPI-Q Impairment of Impulse Control Scale and the TCI Novelty Seeking Scale and in Study 2 by the Barratt Impulsivity Scale (BIS). These data are presented in Table 2. There was a significant difference between the pedophilic group and controls on the DAPI Impulse Control scale but not on the TCI Novelty Seeking scale. Likewise the pedophilic group did not differ from controls on the BIS, although the opiate group scored significantly higher than either of the other two groups (see Table 2).

Propensity for Cognitive Distortions. Traits related to the propensity for cognitive distortions were measured by the MCMI Cluster A personality disorder scales along with the MCMI Delusional Disorder scale in Study 1 and by the SCID II Cluster A personality disorder scales in Study

2. The omnibus test for the MCMI scales was statistically significant and the pedophilic group scored significantly above controls on each of the individual scales. On the SCID II scales, the omnibus test was not statistically significant, but there was a significant group difference on the Paranoid scale and a marginally significant difference on the Schizoid scale. By simple contrasts, the pedophilic group scored marginally higher than controls on Paranoid and significantly higher on Schizoid scales (see Table 2).

Psychopathy. Psychopathy was assessed by the MCMI Antisocial Personality Disorder scale and the DAPI-Q Societal Attitudes and Behavior scales in Study 1 and by the Hare Psychopathy Checklist-Revised in Study 2. The pedophilic group scored significantly higher than controls on both the MCMI and DAPI-Q scales. There were significant group differences on each of the PCL-R Attitudinal, Behavioral, and Total scores. Simple contrasts showed that both the pedophilic group and opiate

Table 2. Potentially Disinhibiting Traits in Pedophiles, Healthy Controls, and Opiate Addicts

Disinhibiting Traits				
	Pedophiles (P)	Healthy Controls (C)	Opiate Addicts (OA)	Statistics
Impulsivity				
DAPI Impulse Control	1.37 ± 1.2*	0.59 ± 0.4	---	F(1,38)=8.23, p=.007
TCI Novelty Seeking	19.00 ± 4.1	17.50 ± 5.4	---	NS
BSI Total Score*	58.38 ± 12.7	57.75 ± 10.0	67.83 ± 6.6	F(3,78)=5.3, p=.002 OA > P
Propensity for Cognitive Distortions				
MCMC Cluster A		Hotelling's T (4,39)=.283, p=.041		
MCMC Schizotypal	20.90 ± 17.7	8.79 ± 6.3	---	F(1,43)=9.74, p=.003
MCMC Paranoid	30.90 ± 16.2	21.50 ± 12.9	---	F(1,43)=4.59, p=.038
MCMC Schizoid	20.55 ± 8.1	16.42 ± 5.1	---	F(1,43)=4.21, p=.046
MCMC Delusional D/O	15.20 ± 9.6	9.5 ± 5.8	---	F(1,43)=5.91, p=.019
SCID II Cluster A**	3.58 ± 3.2	1.33 ± 2.1	3.39 ± 2.9	Wilks' λ (6,140)=0.89, p=.235
SCID II Paranoid	1.48 ± 1.6	0.37 ± 0.9	1.65 ± 1.7	F(4,76)=5.08, p=.001 P > C#
SCID II Schizoid	1.00 ± 1.2	0.26 ± 0.7	0.78 ± 0.9	F(4,76)=2.37, p=.060 P > C
SCID II Schizotypal	1.10 ± 1.7	0.37 ± 0.8	1.65 ± 1.7	NS
Psychopathy				
MCMC Antisocial	34.75 ± 13.9	22.92 ± 12.3	---	F(1,42)=8.93, p=.005
DAPI Societal Attitudes	1.33 ± 1.0	0.80 ± 0.5	---	F(1,39)=4.74, p=.036
DAPI Societal Behavior	0.30 ± 0.3	0.07 ± 0.1	---	F(1,39)=12.33, p=.001
PCL-R Total* Score	11.15 ± 9.5	5.40 ± 5.6	16.08 ± 9.8	F(3,71)=8.4, p<.001 P, OA > C, OA > P
PCL-R Attitudinal*	4.62 ± 3.2	1.16 ± 1.6	4.54 ± 4.0	F(3,71)=6.79, p<.001 P, OA > C
PCL-R Behavioral*	5.62 ± 6.6	1.92 ± 2.5	8.79 ± 4.6	F(3,71)=7.40, p<.001 OA > P, C

* Covaried for education. ** Covaried for education and ethnicity. # Paired contrasts marginally significant at p<.1.

addicted group scored higher than controls on the Total and Attitudinal scores whereas only the opiate addicted group scored higher than controls on the Behavioral scale. Moreover, opiate addicted individuals scored higher than the pedophilic group on the Behavioral scale (see Table 2).

DISCUSSION

This paper presented data from two studies conducted as part of a larger research program investigating behavioral and chemical addictions. The data presented here were collected in an attempt to examine whether characteristic psychological and historical traits could be identified that might shed light on factors contributing to either motivation for or failure to inhibit pedophilic urges. There was some evidence of elevations in each of these domains but the strength of the findings varied considerably. The strongest and most consistent findings were for the history of sexual abuse in childhood,

which distinguished the pedophilic group both from the opiate addicted group and controls, and for psychopathy. The findings of elevated traits related to a propensity for cognitive distortions relative to controls were also quite consistent and appeared specific to the pedophilic group vs. the opiate addicted group. The findings related to traits associated with social anxiety were less consistent and elevations in this domain were less distinguishable from those of the opiate addicted group. This suggests that, while traits related to social anxiety may be elevated in some individuals with pedophilia, this is not a specific finding. Finally, only one out of the three impulsivity measures supported increased impulsivity in the pedophilic group relative to controls. In fact, on the BSI, the opiate addicted group scored significantly higher than the pedophilic group. The elevation in the opiate addicted group compared to the pedophilic group on the behavioral but not attitudinal psychopathy score supports this finding, such that the

opiate addicted group appears in general to be more impulsive than the pedophilic group.

In general, our data is consistent with previous literature as was discussed above in the Introduction section (10, 12, 13, 17, 23, 33). Nonetheless, these data offer novel information. For one, the traits assessed here are collected together and synthesized into an integrated model of traits contributing either to aberrant motivation or inhibitory failure. Secondly, comparisons with a chemically addicted control group allow for assessment of the specificity of these findings. While perpetrators of sexual offences against children have been compared to non-sexual offenders and sexual offenders against adults (5, 17), there is little data comparing pedophilic individuals with non-forensic, clinical control groups.

Our data should be considered within the context of its limitations, however. Our samples were relatively small, our data relied on self-report and were not corroborated by criminal records, and although rating scales were closely supervised, we did not calculate inter-rater reliability coefficients. Further, although almost 60% of subjects in Study 2 reported more than one victim, subjects were not diagnosed by DSM-IV criteria for pedophilia. Finally, subjects with pedophilic behavior were recruited from an outpatient clinic specializing in the treatment of sex offenders and thus may differ from currently incarcerated sex offenders, from individuals with pedophilic behavior who have never been caught or those with pedophilic desire who have never acted on their urges. Nonetheless, our data is consistent with prior literature and contributes to a fuller understanding of the psychological traits potentially contributing to motivation for or the failure to inhibit pedophilic inclinations.

HETEROGENEITY IN PEDOPHILIA

Of particular interest, our data is consistent with prior research showing mixed findings for the degree of impulsivity among individuals with pedophilic behavior (12, 29, 32). Moreover, although elevated rates of childhood sexual abuse are one of the most robust findings in the literature, our data parallels many other studies in showing a high proportion of pedophilic subjects that deny any such history (17, 19, 22). One explanation for these discrepant findings is heterogeneity among pedophiles. Many authors have written about this (1, 2, 45), but there is lack of consensus about the best means of categorizing subgroups. DSM-IV-TR lists subgroups according to sex of the victim, exclusivity of pedophilic desire and pres-

ence of incest (3). The DSM-V work group for pedophilia proposes subgroups based on age and sex of victim (46). Perhaps a more useful distinction is between “true” or “opportunistic” pedophiles. Similar terms include fixated vs. regressed and preferential vs. situational pedophiles (1, 2, 45). A dimensional rather than categorical approach to this distinction has also been proposed (47). True pedophiles have a specific, ongoing sexual attraction to children, which persists relatively independent of context. In contrast, opportunistic pedophiles have less specific sexual attraction to pre-pubescent children and may turn to children for various situational reasons. The distinction between pedophilic and non-pedophilic child molesters falls in a similar vein (20, 48).

Although there is little data comparing true vs. opportunistic pedophiles, we can hypothesize how the traits putatively associated with deviant motivation and impaired inhibition may vary across the two groups. In short, true pedophiles should be strongly characterized by traits related to deviant motivation while opportunistic pedophiles would present significant inhibitory problems. As such, true pedophiles would have higher rates of CSA than opportunistic pedophiles who may in turn be more impulsive and psychopathic. Both might suffer from social anxiety but true pedophiles would be more characterized by cognitive distortions as pedophilic urges and behaviors are more central to their identity. We also hypothesize that true pedophiles might show abnormalities in the amygdalar/temporal regions whereas opportunistic pedophiles might show abnormalities in the frontal regions. Table 3 presents hypothesized traits specific to each subgroup of pedophiles.

There is some support for these hypotheses in the literature. In fact, a study by Eher et al. (8) provides considerable support for this conceptualization.

Table 3.
Hypothesized Distinctions Between “True” and “Opportunistic” Pedophiles

True	Opportunistic
Planful	Impulsive
+/- Psychopathy	Psychopathic
Cognitive Distortions/Cluster A Personality Pathology	Executive Dysfunction
+/- Social Anxiety	+/- Social Anxiety
Childhood Sexual Abuse History	
Amygdalar/Temporal Abnormalities	Frontal Abnormalities

Classifying rapists and child molesters according to the Massachusetts Treatment Center rapist typology, “sexualized” sex offenders against either minors or adults were compared to “non-sexualized” rapists of adults. “Sexualized” sex offenders were motivated primarily by sexual concerns and often showed abnormal sexual arousal patterns. “Non-sexualized” sex offenders were motivated more by “aggression, hostility or vindictiveness.” The two groups of sexualized offenders were similar with regard to anxiety, depression, and aggression while the non-sexualized rapists had greater lifestyle impulsivity, more non-sexual offenses and more antisocial behavior as juveniles and adults. Further, Suchy and colleagues (48) found non-pedophilic child molesters to perform worse on tests of facial and vocal affect recognition than pedophilic child molesters. The authors interpreted this to imply greater levels of psychopathy in non-pedophilic child molesters compared to their pedophilic counterparts. Finally Freund et al. (20) found a higher incidence of childhood sexual abuse in pedophilic vs. non-pedophilic child molesters.

Likewise, our own data comparing opiate addicted and pedophilic subjects are also consistent with the proposed distinctions between true and opportunistic pedophiles. Opiate addicted subjects, characterized by non-sexual, reward driven behavior, show higher levels of impulsivity, lesser incidence of childhood sexual abuse, and greater levels of psychopathic traits than subjects with pedophilic behavior, although this last difference seems largely attributable to behavioral disinhibition.

Our earlier PET study of 15 adult males with pedophilic behavior demonstrated abnormal activation in both frontal and temporal brain regions compared to healthy controls (6). As there is considerable evidence linking abnormal or hypoactive function in the frontal regions to impulsivity and behavioral disinhibition (49, 50), and reduced frontal function has been demonstrated in impulsive groups such as chemically addicted individuals (51), we can hypothesize that if opportunistic pedophiles are characterized by impulsivity, they would also show reduced frontal function. The underlying neuropathology of pedophilic sexual desire, as distinct from impulsivity and psychopathy, is less understood although a 2007 study by Schiltz et al. (52) showed decreased volume in the right amygdala in pedophilic offenders compared to controls on MRI. Amygdalar volume was not correlated with scores on the Hare Psychopathic Checklist but was inversely correlated with the exclusivity of pedophilic offenses, such

that offenders who committed sexual offenses against diverse age groups had higher amygdalar volumes.

All of the traits addressed in this paper, with the possible exception of psychopathy, have established treatments – either psychological, pharmacological or both (4, 34, 47). While many treatments for pedophilia include interventions designed to enhance social skills, combat cognitive distortions, control impulsivity, etc., coordination of such treatments into a comprehensive approach might prove highly beneficial. Moreover, interventions could be customized for each individual following a careful assessment of both inhibitory and motivating factors. In this way, treatments can be developed to address the commonalities among pedophiles without disregarding the oft-noted heterogeneity.

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Contribution of Authors

Dr. Cohen contributed to conceptual and study design, data collection, data analysis, manuscript preparation, editing and revision, and final approval.

Dr. Galynker contributed to conceptual and study design, data collection, staff supervision, manuscript editing, and final approval.

References

1. Prentky RA, Knight RA, Lee AFS. Child sexual molestation: Research issues. In: Bartol C, Bartol AM, editors. *Current perspective in forensic psychology and criminal behavior*, 2nd ed. Thousand Oaks: Sage, 2008: pp. 123-134.
2. Lanning KV. *Child molesters: A behavioral analysis*. [monograph on the Internet]. Alexandria: National Center for Missing & Exploited Children; 2001 [cited 2009 April 6]. Available from: http://www.missingkids.com/en_US/publications/NC70.pdf.
3. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. 4th ed., Text Revision. Washington, DC: American Psychiatric Press, 2000.
4. Seto MC. *Pedophilia and sexual offending against children: Theory, assessment, and intervention*. Washington, DC: American Psychological Association, 2008.
5. Haywood TW, Kravitz HM, Wasylw OE, et al. Cycle of abuse and psychopathology in cleric and noncleric molesters of children and adolescents. *Child Abuse Negl* 1996; 20:1233-1243.
6. Cohen LJ, Nikiforov K, Gans S, Poznansky O, McGeoch P, Weaver C, et al. Hetrosexual male perpetrators of childhood sexual abuse: A preliminary neuropsychiatric model. *Psychiatr Q* 2002; 73:313-335.
7. Cohen LJ, Galynker II. Psychopathology and personality traits of pedophiles: Issues for diagnosis and treatment. *Psychiatric Times* 2009; 26: 25-30.
8. Eher R, Neuwirth W, Fruehwald S, Frottier P. Sexualization and lifestyle impulsivity: clinically valid discriminators in sexual offenders. *Int J Offender Ther Comp Criminol* 2003; 47:452-467.
9. Araj S, Finkelhor D. Explanations of pedophilia: Review of empirical research. *Bull Am Acad Psychiatry Law* 1985;13:17-37.

10. Haywood TW, Grossman LS. Denial of deviant sexual arousal and psychopathology in child molesters. *Behav Ther* 1994; 25:327-340.
11. Blumenthal S, Gudjonsson G, Burns J. Cognitive distortions and blame attribution in sex offenders against adults and children. *Child Abuse Negl* 1999;23:129-143.
12. Raymond NC, Coleman E, Ohlerking F, Christenson GA, Miner M. Psychiatric comorbidity in pedophilic sex offenders. *Am J Psychiatry* 1999;156:786-788.
13. Black DW, Kehrberg LLD, Flumerfelt DL, Schlosser SS. Characteristics of 36 subjects reporting compulsive sexual behavior. *Am J Psychiatry* 1997;154:243-249.
14. Wilson GD, Cox DN. Personality of paedophile club members. *Pers Indiv Diff* 1983;4:323-329.
15. Fisher D, Beech A, Browne A. Comparison of sex offenders to nonoffenders on selected psychological measures. *Int J Offender Ther Comp Criminol* 1999;43:473-491.
16. Black DW. The epidemiology and phenomenology of compulsive sexual behavior. *CNS Spect* 2000;5:26-35.
17. Freund K, Kuban M. The basis of the abused abuser theory of pedophilia: A further elaboration on an earlier study. *Arch Sex Behav* 1994;23:553-563.
18. Cohen LJ, McGeoch PG, Gans SW, Nikiforov K, Cullen K, Galynker II. Childhood sexual history of 20 male pedophiles vs. 24 male healthy control subjects. *J Nerv Ment Dis* 2002;190:757-766.
19. Dhawan S, Marshall WL. Sexual abuse histories of sexual offenders. *Sex Abuse* 1996;8:7-15.
20. Freund K, Watson R, Dickey R. Does sexual abuse in childhood cause pedophilia: An exploratory study. *Arch Sex Behav* 1990;19:557-568.
21. Knopp F, Lackey L. Female sexual abusers: A summary of data from 44 treatment providers. Orwell, Vt.: Safer Society Program, 1987.
22. Seghorn TK, Prentky RA, Boucher RJ. Childhood sexual abuse in the lives of sexually aggressive offenders. *J Am Acad Child Adolesc Psychiatry* 1987;26:262-267.
23. Bagley C, Wood M, Young L. Victim to abuser: Mental health and behavioral sequels of child sexual abuse in a community survey of young adult males. *Child Abuse Negl* 1994;18:683-696.
24. Rick S, Douglas DH. Neurobiological effects of childhood abuse. *J Psychosoc Nurs Ment Health Serv* 2007;45:47-54.
25. Stark CP. Behavioral effects of stimulation of the medial amygdala in the male rat are modified by prior sexual experience. *J Gen Psychol* 2005; 132: 207-224.
26. Stein D, Black DW, Pienaar W. Sexual disorders not otherwise specified: Compulsive, addictive or impulsive? *CNS Spectr* 2000; 5:60-64.
27. Krueger RB, Kaplan MS. Behavioral and psychopharmacological treatment of the paraphilic and hypersexual disorders. *J Psychiatr Pract* 2002;8:21-32.
28. Kafka M. Sexual impulsivity. In Hollander E, Stein D, editors. *Impulsivity and aggression*. New York: John Wiley, 1995: pp. 201-228.
29. Galli V, McElroy SL, Soutullo CA, Kizer D, Raute N, Keck PE Jr, et al. The psychiatric diagnoses of twenty-two adolescents who have sexually molested other children. *Compr Psychiatry* 1999;40:85-88.
30. Cohen LJ, Nesci C, Steinfeld M, Haeri S, Galynker I. Investigating the relationship between sexual and chemical addictions by comparing executive function in pedophiles, opiate addicts and healthy controls. *J Psychiatr Pract* 2010;16:405-412.
31. Cohen LJ, Frenda S, Mojtabei R, Katsadakis K, Galynker I. Comparison of sexual offenders against children with sexual offenders against adolescents and adults: Data from the New York state sex offender registry. *J Psychiatr Pract* 2007; 13:373-384.
32. Gebhard PH, Gagnon JH, Pomeroy WB, Christenson CV. *Sex offenders*. New York: Bantam Books, 1967.
33. Henderson MC, Kalichman SC. Sexually deviant behavior and schizotypy: A theoretical perspective with supportive data. *Psychiatr Q* 1990;61:273-284.
34. Cohen LJ, Grebchenko YF, Steinfeld M, Frenda SJ, Galynker II. Comparison of personality traits in pedophiles, abstinent opiate addicts, and healthy controls: Considering pedophilia as an addictive behavior. *J Nerv Ment Dis* 2008;196:829-837.
35. Cohen LJ, McGeoch P, Watras-Gans S, Acker S, Poznansky O, Cullen K, et al. Personality impairment in male pedophiles. *J Clin Psychiatry* 2002; 63:912-919.
36. First MB, Gibbon M, Spitzer RL, Williams JBW, Benjamin LS. *User's guide for the structured clinical interview for DSM-IV axis II personality disorders*. Washington DC: American Psychiatric Press, 1995.
37. Millon T. *Millon clinical multiaxial inventory-II: Manual for the MCMI-II*. 2nd ed. Minneapolis: National Computer Systems, 1987.
38. Kaye AL, Shea MT. Personality disorders, personality traits, and defense mechanisms. In: Task force for the handbook of psychiatric measures, editors. *Handbook of Psychiatric Measures*. Washington, DC: American Psychiatric Association, 2000: pp. 713-751.
39. Cloninger RC, Svrakic DM, Przybeck TR. A psychobiological model of temperament and character. *Arch Gen Psychiatry* 1993;50:975-990.
40. Cohen LJ, Kingston P, Bell A, Kwon J, Aronowitz B, Hollander E. Comorbid personality impairment in body dysmorphic disorder. *Compr Psychiatry* 2000;41:4-12.
41. Barratt ES, Stanford MS. Impulsiveness. In Costello CG, editor. *Personality characteristics of the personality disordered client*. New York: Wiley, 1995: pp. 91-119.
42. Hollander E, Cohen LJ, Simon L. Impulse control disorder measures. In: Task force for the handbook of psychiatric measures, editors. *Handbook of psychiatric measures*. Washington, DC: American Psychiatric Association, 2000: pp.687-712.
43. Hare RD. *The Hare psychopathy checklist-revised manual*. North Tonawanda, N.Y.: Multi-Health Systems, 1991.
44. Bernstein DP, Fink L, Handelsman L, Foote J, Lovejoy M, Wenzel K, et al. Initial reliability and validity of a new retrospective measure of child abuse and neglect. *Am J Psychiatry* 1994; 151:1132-1136.
45. McConaghy N. Paedophilia: A review of the evidence. *Aust N Z J Psychiatry* 1998;32:252-265.
46. American Psychiatric Association. *DSM-5 Development*. [homepage on the Internet]. Washington, DC: American Psychiatric Association; 2010 [updated 2010 February 2; cited 2010 October 12] Available from: <http://www.dsm5.org/>.
47. Maletzky BM. Factors associated with success and failure in the behavioral and cognitive treatment of sexual offenders. *Sex Abuse J Res Treat* 1993; 6:241-258.
48. Suchy Y, Whittaker WJ, Strassberg DS, Eastvold A. Facial and prosodic affect recognition among pedophilic and nonpedophilic criminal child molesters. *Sex Abuse J Res Treat* 2009; 21:93-110.
49. Oldham J, Hollander E, Skodol A. *Impulsivity and compulsivity*. Washington DC: American Psychiatric Press, 1996.
50. Coccaro EF, Siever LJ, Klar HM, Maurer G, Cochrane K, Cooper TB, et al. Serotonergic studies in patients with affective and personality disorders: correlates with suicidal and impulsive aggressive behavior. *Arch Gen Psychiatry* 1989;46:587-599.
51. Galynker I, Eisenberg D, Matochik JA, Gertmenian-King E, Cohen LJ, Kimes AS, et al. Cerebral metabolism and mood in remitted opiate dependence. *Drug Alcohol Depend* 2007; 90: 166-174.
52. Schiltz K, Witzel J, Northoff G, Zierhut K, Gubka U, Fellmann H, et al. Brain Pathology in pedophilic offenders: Evidence of volume reduction in the right amygdala and related diencephalic structures. *Arch Gen Psychiatr* 2007;64:737-746.