

# Comparison of Sexual Offenders Against Children with Sexual Offenders Against Adolescents and Adults: Data from the New York State Sex Offender Registry

LISA J. COHEN, PhD  
STEVEN FRENDA  
RAMIN MOJTABAI, MD, PhD  
KOSTAS KATSAVDAKIS, PhD  
IGOR GALYNKER, MD, PhD

**Objective.** To examine whether sexual offenders against children have fewer characteristics associated with impulsive-aggression and more characteristics associated with aberrant sexual arousal than do sexual offenders against adolescents and adults. **Methods.** Data on 837 sex offenders from the New York State Sex Offender Registry for the five counties of New York City were analyzed using multinomial logistic regression. **Results.** Compared to offenders against older age groups, offenders against children were older and less likely to use force or a weapon. They were more likely to molest males or victims of both genders than female victims only, and they were also more likely to molest known victims. They were also more likely to commit multiple acts and “deviate intercourse” and less likely to commit sexual intercourse. Offenders against adolescents largely fell between the two other groups. **Conclusions.** Relative to sexual offenders against adults, pedophiles may be characterized more by aberrant sexual arousal than by impulsivity and aggression. This distinction has significant implications for the selection of targeted treatments and for the direction of future research. (*Journal of Psychiatric Practice* 2007;13:373–384)

KEY WORDS: pedophilia, child abuse, sexual abuse, sex offender, Sex Offender Registry

The degree to which pedophilia is driven by impulsive-aggression rather than aberrant sexual desire is an important consideration that can shed light on the underlying mechanisms of pedophilia. As with other forms of sexual aggression, pedophilic behavior has been linked to impulsivity<sup>1</sup> and impulsive-aggression,<sup>2</sup> although the degree of impulsivity among pedophiles is the subject of some controversy.<sup>3,4</sup> Likewise the degree of aggression in pedophilic behavior has significant public import. Although violent pedophiles receive the most media attention and present the most obvious danger, several studies suggest that pedophiles are not characteristically aggressive.<sup>3–7</sup> In contrast, there is evidence that pedophiles demonstrate aberrant sexual arousal above and beyond their sexual attraction to children.<sup>8–11</sup> Systematic study of such issues has significant implications for the design of targeted treatments and prevention methods.

Although our previous research suggested that pedophiles did not significantly differ from controls on neuropsychological and personality measures of impulsivity or aggression,<sup>3,5,8</sup> we did find aberrant sexual arousal patterns in pedophiles relative to controls on phallometric measures and positron emission tomography (PET).<sup>8</sup>

Likewise, compared to sexual assailants against older age groups, previous reports have suggested that pedophiles are more likely to show lower levels of violence, aggression,<sup>4,12,13</sup> and psychopathy.<sup>14,15</sup> Pedophiles may also be older, specifically 40 years of age or older, than offenders against different age groups.<sup>16,17</sup> Offender age is relevant here because impulsive-aggression is inversely related to age.<sup>18</sup> In other studies, however, pedophiles were more likely to demonstrate neurodevelopmental abnormalities, such as left-handedness or a lower IQ,<sup>19</sup> which may correlate with impulsivity.

Furthermore, compared with sexual assailants against older age groups, pedophiles were more likely to demonstrate aberrant sexual arousal, including general

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COHEN, MOJTABAI, and GALYNKER: Beth Israel Medical Center, Albert Einstein College of Medicine, New York; FRENDA: Preventive Medicine Research Institute, Sausalito, CA; KATSAVDAKIS: Center for Forensic and Clinical Psychology, New York.

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Please send correspondence and reprint requests to: Lisa J. Cohen, PhD, Beth Israel Medical Center, 1st Ave. & 16th St., New York, NY 10003. Lcohen@chpnet.org

hyperarousal, specific arousal to prepubescent children, and aberrant sexual fantasies,<sup>8,10,11</sup> and to have been sexually abused as children.<sup>20–22</sup> Pedophiles who molested males and non-familial females also reported more comorbid paraphilias than did adult rapists.<sup>9</sup> Thus the mechanisms underlying pedophilic behavior may differ from those underlying aberrant sexual behavior with older targets.

Nonetheless, previous research studies published in this area have several limitations. These include small sample size, reliance on self-report data, and/or lack of multivariate analyses, which allow identification of the unique impact of each separate variable by adjusting for the effects of all other variables. In addition, since pedophilia is characterized by behavior that is both illegal and socially undesirable, there is great potential for both underreporting and self-selection bias in research based on self-report data with research volunteers.

To overcome these limitations in the present study, we utilized data from the New York Sex Offender Registry, a public access database that lists a broad range of information from the criminal records of all convicted sex offenders in New York State released into the community since 1996. Using this dataset, we tested the hypotheses that sexual offenders against children exhibit fewer traits related to impulsive-aggression and more traits related to aberrant sexual desire compared with sexual offenders against older age groups. Although criminal offense characteristics are not direct measures of psychobiological traits, examination of judicial records offers an alternative approach to assessment of these characteristics, which, in conjunction with more traditional assessment techniques, can support a multidimensional understanding of pedophilia. Specifically, the present study compares 837 sexual offenders against children, adolescents, and adults on 11 offense-related variables using multinomial logistic regression.

In line with our hypothesis that pedophiles have fewer impulsive aggressive traits compared with other sexually aggressive groups, we predicted that offenders against children would be older at the time of offense and less likely to use force or weapons than offenders against older age groups. In line with our hypothesis that pedophiles have greater aberrant sexual arousal patterns, we predicted that, compared with offenders against older age groups, offenders against children would have a greater number of victims and acts, more male victims, and less severe acts—characteristics consistent with a persistent pattern of deviant sexual arousal.<sup>4,23,24</sup> This study adds to the existing literature in that it is, to our knowledge, the only study to specifically address the relative primacy of

impulsive-aggression vs. aberrant sexual arousal patterns in pedophiles. It is also one of the few large sample studies that has compared sex offenders against different age groups using multivariate analyses on a broad range of variables.

## METHODS

### Source of Data

Data were drawn from the New York State Sex Offender Registry, a public-access database in which data on all Level 3 sex offenders who have been released back into the community since 1996 are made available to the general public. Convicted sex offenders are classified through a court hearing into one of three levels reflecting risk of reoffense, level 1 (low risk), 2 (moderate risk), or 3 (high risk). Factors considered in making this determination include, but are not limited to, the use of force, weapons, alcohol, or drugs, victim's age, number of victims, assault or injury of the victim, and relationship to the victim. As the information in the registry is presented in accordance with New York State penal law, it was readily codified into numerical variables for statistical analysis. Of note, the registry only contains information about the index crime. Thus, our data do not pertain to prior convictions. The present study focused on the five counties of New York City (New York, Kings, Queens, Bronx, and Richmond), from which we identified a total of 998 non-duplicate records. The sample was restricted to males only, since the number of females ( $n = 6/998$ , 0.6%) was too small for meaningful analysis. The final sample for this study consisted of the 837 cases of male offenders in which the records included data on the age of the victim(s). All data listed below pertain to this final sample of 837 cases.

### Variables

**Offender characteristics.** Data were collected on the offenders' age and race/ethnicity. The offender's age was calculated by subtracting year of birth from the year of conviction. Because the sample was skewed toward younger ages (median age = 30 years, 75th percentile = 37 years), offenders were grouped by age using categories designed to optimize both sample distribution and clinical significance and to be consistent with previous studies.<sup>16,25</sup> Thus, offenders were categorized based on age into one of three groups, < 25 years, 26–39 years, and over 40 years. The registry followed federal guidelines in classifying race (black, white, Asian, American Indian, and other) and ethnicity (Hispanic/non-Hispanic). For ease of

analysis, subjects were grouped into 4 categories of non-Hispanic white, Hispanic, non-Hispanic black, and other.

**Victim characteristics.** Data on the characteristics of each offender's victims were also collected and included number of victims, age of victim(s), gender of victim(s), and relationship of offender to victim(s). Based on the age of the youngest victim, offenders were categorized into offenders against children (OCs) (youngest victim < 13 years of age), offenders against adolescents (youngest victim 13–17 years of age) referred to as offenders against pubescent minors (OPs), and offenders against adults (OAs) (youngest victim 18 years of age or older). The number of victims was coded as a binary variable, as one versus more than one victim. The gender of the victim(s) was recorded, indicating if there was a male victim as well as if there had been victims of both genders in the case of offenders with more than one victim. A variety of relationships between offender and victim (e.g., baby sitter, authority figure, or stranger) were listed in the registry. Due to the small number of cases in each category, we collapsed the data into two categories: stranger versus non-stranger. Offenders who had had any defined relationship with the victim (e.g., baby sitter, authority figure) were categorized as non-strangers. Data on relationship were missing for a considerable portion of the sample (i.e., in 635 (75.9%) of the 837 records we examined) because this field was often left blank.

**Offense characteristics.** Data on the characteristics of the offense(s) were collected and included severity, "sexual intercourse," "deviate intercourse," more than one act, degree of force, use of weapon, conviction class, and maximum sentence. The registry listed the specific sexual acts committed as defined by the New York State Penal Code (e.g., sexual intercourse, sexual contact). We coded the severity level of the worst offense based on the legal statutes. More severe offenses included "Sexual Intercourse, Deviate Intercourse, and Kidnapping." Less severe offenses included "Disseminated Indecent Materials, Sexual Contact, Child Sex Performance, and Prostitution Offenses." We also coded the presence or absence of sexual intercourse and the presence or absence of "deviate intercourse." "Sexual intercourse" is defined in the New York State penal code as follows: "Sexual intercourse has its ordinary meaning and occurs upon any penetration, however slight." "Deviate intercourse" is defined as "contact between the penis and the anus, the mouth and penis, or the mouth and the vulva." Although New York State replaced the term "deviate intercourse" with the terms "oral sexual conduct" and "anal sexual conduct"

in 2003, this change only affected a small fraction (3.9%) of the final sample. The registry indicated whether the offenses had occurred "more than once," which was then coded as a binary variable. The type of force used was condensed into three levels: none, threat/coercion, or physical force/violence. The presence of a weapon was coded as a binary variable. Convictions increase in severity from Class B to Class A misdemeanors and from Class E to Class A felonies. In the event of multiple convictions, the most severe conviction was listed. We entered the maximum sentence (transformed into years) in our analysis as it offered greater variation than the minimum sentence.

In order to test the hypothesis that offenders against children would show fewer features related to impulsive-aggression and more features related to aberrant sexual desire, the following variables were classified as related to impulsive-aggression: use of force, use of a weapon, and age of offender. The following variables were then associated with aberrant sexual arousal patterns: gender of victim (male victim and victims of both genders), more than one act, more than one victim, "sexual intercourse," "deviate intercourse," and severity of offense.

### IRB Approval

The study was approved by the Beth Israel Medical Center Institutional Review Board as a de-identified data study, which allows human subjects research in the absence of informed consent. To protect subject confidentiality, all identifying data were excluded from our database.

### Data Analysis

Statistical analysis was performed with multinomial logistic regression. This procedure is an adaptation of binary logistic regression for an outcome variable with more than 2 categories.<sup>26</sup> The results of the multinomial logistic regression can be interpreted as if they come from a series of binary logistic regression analyses in which each of the outcome categories is contrasted with a common reference category. For example, in this study, the outcome variable of age of victim has three categories (< 13 years of age, 13–17 years of age, and > 18 years of age) and produced two binary sub-models with outcomes < 13 years vs. > 18 years and 13–17 vs. > 18 years, respectively (with the > 18 years of age category used as the common reference category). The regression coefficients obtained in these analyses can then be transformed into odds ratios (ORs).

Analyses were conducted in two stages. First, bivariate multinomial logistic regression analysis was used to

provide a descriptive analysis of the three offender groups. The dependent variable in these analyses was age group of the youngest victim, categorized into three age groups as noted above. All other variables were then entered into the model one at a time as independent variables. The ORs obtained in these models are thus not adjusted for the other variables. As noted above, the ORs in multinomial logistic regression models compare each category with a reference category. To compare OCs and OPs with OAs, the OA category was set as the reference category. To compare the OCs with the OPs, the regression analyses were rerun with the OP category set as the reference category.

In the second stage of the analysis we used multivariate multinomial logistic regression models to identify variables that uniquely identify offender groups after adjusting for other variables in the model. These analyses are thus adjusted for the effects of all variables in the models. Two models were run that dealt with missing data in different ways. First, an analysis with list-wise deletion of cases with missing data was conducted. Three variables with over 50% of data missing were excluded from this analysis (use of force, use of weapon, and relationship with victim). Second, multivariate analysis was repeated with imputed values for missing data. All variables were included in these analyses. The method of multiple imputation (MI) was used to impute missing data. The technical details of the MI method are described elsewhere.<sup>27-29</sup> Briefly, MI is a method for replacing each missing value with a set of  $m > 1$  imputed values, thus creating  $m$  (10 in the present study) new datasets to account for the uncertainty of the imputed values. The imputation uses Bayesian statistical methods and imputes values by drawing randomly from the predictive distribution for missing values based on separate regression models for each variable with missing values. All the variables in the dataset (Table 1) were included as independent variables in these regression models. The resulting imputed datasets are then analyzed using standard statistical software and the results of these analyses are combined using formulas proposed by Rubin.<sup>29</sup> The standard errors of final estimates take into account both variations within each variable as well as across the same variable in the 10 datasets.

SPSS 11.0 software<sup>30</sup> was used for bivariate multinomial logistic regression analyses and for the multivariate logistic regression analysis with list-wise deletion. The `ice` and `micombine` subroutines<sup>31</sup> of the STATA 8.2 software<sup>32</sup> were used for multivariate multinomial logistic regression analysis with missing data. Significance level for statistical tests was set at  $p < 0.05$ .

## RESULTS

### Bivariate Analyses

Characteristics of the 837 male offenders in the sample and results of the bivariate analyses are shown in Table 1. In comparison with both OA and OP groups, OCs were more likely ( $OR > 1, p = 0.05$ ) to be older and less likely ( $OR < 1, p = 0.01$ ) to use either physical force or a weapon. OCs were also more likely to offend against male victims or victims of both genders than to offend against female victims only, to have more than one victim or more than one act, to have "deviate sexual intercourse," to be known to the victim, and to have less severe offenses. They were less likely to have "sexual intercourse."

Similarly, in comparison with OAs, OPs were more likely to be older, have a male victim, be known to the victim, and commit more than one act. Further, OAs had the longest maximum sentence and the most severe convictions followed by OCs. Finally, OCs were less likely than OAs to belong to the non-Hispanic black group rather than the reference group of non-Hispanic whites. There were no other differences across groups in race/ethnicity.

### Multivariate Analyses

Tables 2 and 3 present the results of the multivariate analyses. Results of the multivariate multinomial logistic regression analysis with list-wise deletion of cases with missing data and excluding variables with  $> 50\%$  missing data are presented in Table 2. This analysis found that OCs compared with OAs were more likely to have more than one victim, more than one act, a male victim, and shorter maximum sentences. They were also less likely to have "sexual intercourse." In comparison with OPs, OCs were more likely to be older (aged 26–39 vs.  $< 25$ ), to have more than one victim, to be in the Hispanic group vs. the reference category of non-Hispanic whites, and to have more severe convictions (i.e., proportionately fewer convictions of lesser severity). They were less likely to have "sexual intercourse." Compared with OAs, OPs were more likely to have male victims. They also had less severe convictions (i.e., proportionately more convictions of lesser severity) and shorter prison sentences. (See Table 2.)

The multivariate analysis with multiply imputed missing data allowed comparison of use of force, use of weapons, and relationship with victim(s) across groups. Corroborating findings from the bivariate analyses, OCs were less likely than OAs to have used physical force or violence. Compared to both OAs and OPs, they were less likely to have used weapons and more likely to have more

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**Table 1. Characteristics and bivariate comparisons of 837 male offenders in the New York State Sex Offender Registry grouped according to the age of youngest victims**

	<i>Offenders grouped by victim age</i>			<i>Bivariate comparisons</i>					
	<i>OC</i>	<i>OP</i>	<i>OA</i>	<i>OC vs OA</i>		<i>OP vs OA</i>		<i>OC vs OP</i>	
	<i>&lt; 13 yr</i>	<i>13–17 yr</i>	<i>≥ 18 yr</i>	<i>&lt; 13 vs ≥ 18 yr</i>		<i>13–17 vs ≥ 18 yr</i>		<i>&lt; 13 vs 13–17 yr</i>	
	<i>n (%)</i>	<i>n (%)</i>	<i>n (%)</i>	<i>OR</i>	<i>95% CI</i>	<i>OR</i>	<i>95% CI</i>	<i>OR</i>	<i>95% CI</i>
<b>Variables associated with impulsive aggression</b>									
Offender's age, yr									
≥ 40	100 (25.4)	54 (23.4)	22 (10.5)	<b>4.31</b>	<b>2.51–7.42<sup>‡</sup></b>	<b>2.93</b>	<b>1.64–5.23<sup>‡</sup></b>	1.47	0.95–2.30
26–39	195 (49.6)	99 (42.9)	94 (45.0)	<b>1.97</b>	<b>1.35–2.87<sup>‡</sup></b>	1.26	0.83–1.90	<b>1.57</b>	<b>10.7–2.30*</b>
≤ 25	98 (24.9)	78 (33.8)	93 (44.5)	1.00		1.00		1.00	
Use of force									
Physical force/violence	52 (37.1)	74 (58.7)	84 (73.7)	<b>0.08</b>	<b>0.03–0.24<sup>‡</sup></b>	<b>0.19</b>	<b>0.06–0.57<sup>†</sup></b>	<b>0.43</b>	<b>0.22–0.84*</b>
Threat/coercion	57 (40.7)	33 (26.2)	26 (22.8)	<b>0.28</b>	<b>0.09–0.88*</b>	<b>0.27</b>	<b>0.08–0.88*</b>	1.06	0.52–2.16
No use of force	31 (22.1)	19 (15.1)	4 (3.5)	1.00		1.00		1.00	
Use of weapon									
Yes	34 (28.3)	48 (47.1)	83 (80.6)	<b>0.10</b>	<b>0.06–0.18<sup>‡</sup></b>	<b>0.21</b>	<b>0.12–0.40<sup>‡</sup></b>	<b>0.45</b>	<b>0.26–0.78<sup>†</sup></b>
No	86 (71.7)	54 (52.9)	20 (19.4)	1.00		1.00		1.00	
<b>Variables associated with aberrant sexual arousal</b>									
Any male victim									
Yes	102 (26.6)	33 (14.6)	6 (2.9)	<b>12.28</b>	<b>5.29–28.83<sup>‡</sup></b>	<b>5.78</b>	<b>2.37–14.11<sup>‡</sup></b>	<b>2.12</b>	<b>1.38–3.27<sup>†</sup></b>
No	281 (73.4)	193 (85.4)	203 (97.1)	1.00		1.00		1.00	
Victims' gender mix									
Both genders	17 (4.4)	3 (1.3)	2 (1.0)	<b>4.78</b>	<b>1.09–20.90*</b>	1.37	0.23–8.30	<b>3.48</b>	<b>1.01–12.00*</b>
One gender	368 (95.6)	226 (98.7)	207 (99.0)	1.00		1.00		1.00	
Number of victims									
More than one	129 (32.8)	39 (16.7)	27 (12.9)	<b>3.31</b>	<b>2.10–5.22<sup>‡</sup></b>	1.36	0.80–2.32	<b>2.43</b>	<b>1.62–3.64<sup>‡</sup></b>
One	264 (67.2)	194 (83.3)	183 (87.1)	1.00		1.00		1.00	
"Sexual intercourse" <sup>a</sup>									
Yes	156 (41.9)	150 (67.9)	150 (75.0)	<b>0.24</b>	<b>0.17–0.35<sup>‡</sup></b>	0.70	0.46–1.08	<b>0.34</b>	<b>0.24–0.49<sup>‡</sup></b>
No	216 (58.1)	71 (32.1)	50 (25.0)	1.00		1.00		1.00	
"Deviate intercourse" <sup>b</sup>									
Yes	195 (52.4)	89 (40.3)	86 (43.0)	<b>1.46</b>	<b>1.03–2.06*</b>	0.89	0.61–1.32	<b>1.63</b>	<b>1.17–2.29<sup>†</sup></b>
No	177 (47.6)	132 (59.7)	114 (57.0)	1.00		1.00		1.00	
Number of offenses									
More than one	183 (49.2)	76 (34.2)	44 (21.9)	<b>3.45</b>	<b>2.34–5.11<sup>‡</sup></b>	<b>1.86</b>	<b>1.20–2.87<sup>‡</sup></b>	<b>1.86</b>	<b>1.32–2.62<sup>‡</sup></b>
One	189 (50.8)	146 (65.8)	157 (78.1)	1.00		1.00		1.00	
Offense severity level									
Less severe <sup>c</sup>	91 (24.5)	29 (13.1)	25 (12.5)	<b>2.27</b>	<b>1.40–3.67<sup>†</sup></b>	1.06	0.60–1.88	<b>2.14</b>	<b>1.36–3.38<sup>†</sup></b>
More severe <sup>d</sup>	281 (75.5)	192 (86.9)	175 (87.5)	1.00		1.00		1.00	

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**Table 1. continued**

	<i>Offenders grouped by victim age</i>			<i>Bivariate comparisons</i>					
	<i>OC</i>	<i>OP</i>	<i>OA</i>	<i>OC vs OA</i>		<i>OP vs OA</i>		<i>OC vs OP</i>	
	<i>&lt; 13 yr</i>	<i>13–17 yr</i>	<i>≥ 18 yr</i>	<i>&lt; 13 vs ≥ 18 yr</i>		<i>13–17 vs ≥ 18 yr</i>		<i>&lt; 13 vs 13–17 yr</i>	
	<i>n (%)</i>	<i>n (%)</i>	<i>n (%)</i>	<i>OR</i>	<i>95% CI</i>	<i>OR</i>	<i>95% CI</i>	<i>OR</i>	<i>95% CI</i>
<b>Additional variables</b>									
Offender's race/ethnicity									
Non-Hispanic black	188 (48.0)	133 (57.6)	149 (71.3)	<b>0.47</b>	<b>0.25–0.87*</b>	0.53	0.27–1.03	0.89	0.52–1.51
Hispanic	147 (37.5)	60 (26.0)	41 (19.6)	1.33	0.68–2.61	0.87	0.42–1.81	1.54	0.87–2.71
Other race/ethnicity	14 (3.6)	11 (4.8)	3 (1.4)	1.74	0.44–6.85	2.17	0.53–9.00	0.80	0.32–2.02
Non-Hispanic white	43 (11.0)	27 (11.7)	16 (7.7)	1.00		1.00		1.00	
Relationship with offender									
Non-stranger	87 (90.6)	35 (62.5)	16 (32.0)	<b>20.54</b>	<b>8.29–50.92‡</b>	<b>3.54</b>	<b>1.59–7.91†</b>	<b>5.80</b>	<b>2.42–13.89‡</b>
Stranger	9 (9.4)	21 (37.5)	34 (68.0)	1.00		1.00		1.00	
Most severe conviction									
Class A or B misdemeanor	13 (3.6)	16 (7.4)	3 (1.6)	2.71	0.76–9.66	<b>8.84</b>	<b>2.51–31.09†</b>	<b>0.31</b>	<b>0.14–0.66†</b>
Class E felony	5 (1.4)	41 (19.0)	2 (1.0)	1.57	0.30–8.16	<b>33.96</b>	<b>8.04–143.49‡</b>	<b>0.05</b>	<b>0.02–0.12*</b>
Class C or D felony	81 (22.4)	60 (27.8)	22 (11.5)	<b>2.31</b>	<b>1.38–3.84†</b>	<b>4.52</b>	<b>2.61–7.82‡</b>	0.51	0.34–0.77
Class A or B felony	262 (72.6)	99 (45.8)	164 (85.9)	1.00		1.00		1.00	
	<i>Mean (SD)</i>	<i>Mean (SD)</i>	<i>Mean (SD)</i>						
Maximum sentence, yr	7.9 (6.7)	6.1 (5.6)	15.3 (16.7)	<b>0.91</b>	<b>0.89–0.93‡</b>	<b>0.86</b>	<b>0.84–0.89‡</b>	<b>1.05</b>	<b>1.02–1.08†</b>
OCs = offenders against children; youngest victim < 13 years old					b“Deviate intercourse” refers to contact between the genitals and either the mouth or the anus.				
OPs = offenders against adolescents (pubescent minors); youngest victim 13–17 years old					cLess severe offenses consisted of disseminated indecent materials, sexual contact, child sex performance, prostitution offenses.				
OAs = offenders against adults; youngest victim ≥ 18 years old					dMore severe offenses consisted of sexual intercourse, deviate intercourse, kidnapping.				
OR = odds ratio					* <i>p</i> < 0.05, † <i>p</i> < 0.01, ‡ <i>p</i> < 0.001				
95% CI = 95% confidence interval									
a“Sexual intercourse” was defined as “having its ordinary meaning and occurs upon any penetration, however slight.”									

than one victim and to have known the victim(s) (See Table 3). In addition, OCs had more male victims than OAs. Moreover, OCs were less likely than OPs to have had “sexual intercourse,” while they were more likely than both groups to have had “deviate intercourse.” Findings on convictions were largely replicated, although only OPs had shorter maximum sentences compared to OAs. The difference in maximum sentence between OCs and OAs was no longer statistically significant.

Offender age was no longer statistically significant in the multivariate analyses with multiple imputed data, which probably reflects intercorrelations between offender age and other variables, such as use of weapon ( $r = -0.34, p < 0.001$ ), use of force ( $r = -0.15, p = 0.001$ ), and relationship to victim ( $r = 0.21, p = 0.002$ ).

Finally, in order to check whether offenders with victims from multiple age groups (e.g., children and adoles-

cents) differed from those with victims in only one age group, we reran both the bivariate and multivariate multinomial logistic regression analyses with age of oldest victim as the outcome (dependent) variable. Our results remained essentially unchanged with the exception that the effect for “deviate intercourse” in the bivariate analysis and “sexual intercourse” in the multivariate analysis reduced in significance to the level of a trend.

### DISCUSSION

In sum, in a sample of all Level 3 sex offenders released into the five counties of New York City since 1996, offenders against children were found to differ robustly from offenders against older age groups. Consistent with our hypotheses regarding impulsive-aggression, offenders against children were older and less likely to use force or

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**Table 2. Multivariate multinomial logistic regression analyses for 706 male offenders in the New York State Sex Offender Registry database** (analyses were conducted using list-wise deletion of cases with missing data and only included variables with < 50% missing data)

	<i>Comparison of offenders grouped by victim age</i>					
	<i>OC vs OA</i>		<i>OP vs OA</i>		<i>OC vs OP</i>	
	<i>&lt; 13 vs ≥ 18 yr</i>		<i>13–17 vs ≥ 18 yr</i>		<i>&lt; 13 vs 13–17 yr</i>	
	<i>AOR</i>	<i>95% CI</i>	<i>AOR</i>	<i>95% CI</i>	<i>AOR</i>	<i>95% CI</i>
<b>Variables associated with impulsive aggression</b>						
Offender's age, yr						
≥ 40	1.58	0.81–3.09	1.26	0.62–2.59	1.26	0.71–2.22
26–39	1.41	0.88–2.27	0.72	0.43–1.21	<b>1.97</b>	<b>1.23–3.16<sup>†</sup></b>
≤ 25	1.00		1.00		1.00	
<b>Variables associated with aberrant sexual arousal</b>						
More than one victim	<b>2.13</b>	<b>1.09–4.18*</b>	1.17	0.54–2.52	<b>1.82</b>	<b>1.01–3.28*</b>
Any male victim	<b>5.85</b>	<b>1.89–18.06<sup>†</sup></b>	<b>6.07</b>	<b>1.81–20.41<sup>†</sup></b>	0.96	0.50–1.88
Victims from both genders	0.65	0.09–4.81	0.12	0.01–1.82	5.54	0.64–47.79
“Sexual intercourse” <sup>a</sup>	<b>0.48</b>	<b>0.25–0.94*</b>	1.14	0.53–2.45	<b>0.42</b>	<b>0.22–0.80<sup>†</sup></b>
“Deviate intercourse” <sup>b</sup>	1.20	0.71–2.03	0.98	0.55–1.74	1.22	0.71–2.09
More than one offense	<b>2.09</b>	<b>1.26–3.49<sup>†</sup></b>	1.73	0.98–3.04	1.21	0.77–1.91
Less severe offense <sup>c</sup>	0.92	0.37–2.30	0.52	0.18–1.48	1.78	0.76–4.17
<b>Additional variables</b>						
Offender's race/ethnicity						
Non-Hispanic black	1.55	0.32–7.52	1.49	0.29–7.62	1.04	0.32–3.32
Hispanic	1.62	0.63–4.12	0.67	0.24–1.84	<b>2.41</b>	<b>1.09–5.33*</b>
Other race/ethnicity	0.66	0.27–1.57	0.66	0.26–1.67	0.99	0.47–2.09
Non-Hispanic white	1.00		1.00		1.00	
Most severe conviction						
Class A or B misdemeanor	1.55	0.32–7.52	2.69	0.66–10.94	<b>0.19</b>	<b>0.07–0.54<sup>†</sup></b>
Class E felony	0.31	0.05–2.10	<b>14.26</b>	<b>3.14–64.80<sup>†</sup></b>	<b>0.02</b>	<b>0.01–0.08<sup>‡</sup></b>
Class C or D felony	0.75	0.40–1.41	<b>2.16</b>	<b>1.12–4.19*</b>	<b>0.35</b>	0.21–0.58
Class A or B felony	1.00		1.00		1.00	
Maximum sentence, yr	<b>0.90</b>	<b>0.87–0.93<sup>‡</sup></b>	<b>0.90</b>	<b>0.86–0.94<sup>‡</sup></b>	1.00	0.96–1.04

OCs = offenders against children; youngest victim < 13 years old  
 OPs = offenders against adolescents (pubescent minors); youngest victim 13–17 years old  
 OAs = offenders against adults; youngest victim ≥ 18 years old  
 AOR = adjusted odds ratio  
 95% CI = 95% confidence interval  
<sup>a</sup>“Sexual intercourse” was defined as “having its ordinary meaning and occurs upon any penetration, however slight.”

<sup>b</sup>“Deviate intercourse” refers to contact between the genitals and either the mouth or the anus.  
<sup>c</sup>Less severe offences consisted of disseminated indecent materials, sexual contact, child sex performance, and prostitution offenses versus sexual intercourse, deviate intercourse, kidnapping.

\**p* < 0.05, <sup>†</sup>*p* < 0.01, <sup>‡</sup>*p* < 0.001

a weapon compared to the other offender groups. Likewise, consistent with our hypothesis regarding aberrant sexual arousal patterns, they were more likely than other offender groups to molest both males and known

victims, and to have more than one victim or more than one act. Further, they were less likely to commit sexual intercourse and more likely to commit “deviate intercourse.” On most variables, offenders against adolescents

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**Table 3. Multivariate multinomial logistic regression analyses for 837 male offenders in the New York State Sex Offender Registry database** (analyses were conducted using multiple imputation of missing data)

	<i>Comparison of offenders grouped by victim age</i>					
	<i>OC vs OA &lt; 13 vs ≥ 18 yr</i>		<i>OP vs OA 13–17 vs ≥ 18 yr</i>		<i>OC vs OP &lt; 13 vs 13–17 yr</i>	
	<i>AOR</i>	<i>95% CI</i>	<i>AOR</i>	<i>95% CI</i>	<i>AOR</i>	<i>95% CI</i>
<b><i>Variables associated with impulsive aggression</i></b>						
Offender's age, yr						
≥ 40	1.21	0.53–2.78	1.32	0.62–2.81	0.92	0.49–1.73
26–39	1.31	0.67–2.58	0.77	0.45–1.32	1.71	0.96–3.04
≤ 25	1.00		1.00		1.00	
Use of force						
Physical force/violence	<b>0.16</b>	<b>0.04–0.62<sup>†</sup></b>	0.35	0.08–1.62	0.45	0.16–1.28
Threat/coercion	0.63	0.14–2.73	0.50	0.11–2.21	1.26	0.43–3.71
None	1.00		1.00		1.00	
Used weapon	<b>0.17</b>	<b>0.07–0.41<sup>‡</sup></b>	0.84	0.39–1.80	<b>0.20</b>	<b>0.08–0.49<sup>‡</sup></b>
<b><i>Variables associated with aberrant sexual arousal</i></b>						
Any male victim	<b>4.68</b>	<b>1.34–16.42<sup>*</sup></b>	<b>7.32</b>	<b>2.12–25.27<sup>†</sup></b>	0.64	0.30–1.36
Victims from both genders	0.37	0.03–5.24	0.11	0.01–1.69	3.35	0.48–23.37
“Sexual intercourse” <sup>a</sup>	0.52	0.24–1.15	1.18	0.55–2.56	<b>0.44</b>	<b>0.20–0.97<sup>*</sup></b>
“Deviate intercourse” <sup>b</sup>	<b>2.41</b>	<b>1.19–4.87<sup>†</sup></b>	1.04	0.57–1.91	<b>2.31</b>	<b>1.18–4.50<sup>*</sup></b>
More than one victim	<b>3.59</b>	<b>1.46–8.84<sup>†</sup></b>	1.50	0.69–3.23	<b>2.40</b>	<b>1.19–4.83<sup>*</sup></b>
More than one offense	0.93	0.45–1.92	1.36	0.71–2.60	0.69	0.36–1.33
Less severe offense <sup>c</sup>	1.41	0.38–5.25	0.60	0.20–1.77	2.36	0.76–0.80
<b><i>Additional variables</i></b>						
Offender's race/ethnicity						
Non-Hispanic black	0.98	0.37–2.64	0.98	0.39–2.49	1.00	0.47–2.13
Hispanic	2.32	0.78–6.87	1.04	0.39–2.77	2.22	0.92–5.34
Other race/ethnicity	2.24	0.32–15.53	2.90	0.52–16.31	0.77	0.21–2.84
Non-Hispanic white	1.00		1.00		1.00	
Non-stranger relationship	<b>8.78</b>	<b>1.91–40.41<sup>†</sup></b>	1.62	0.56–4.66	<b>5.42</b>	<b>1.29–22.75<sup>*</sup></b>
Most severe conviction						
Class A or B misdemeanor	0.69	0.14–3.45	2.78	0.64–12.07	<b>0.25</b>	<b>0.08–0.80<sup>†</sup></b>
Class E felony	0.82	0.10–6.73	<b>14.97</b>	<b>3.23–69.44<sup>†</sup></b>	<b>0.05</b>	<b>0.01–0.23<sup>‡</sup></b>
Class C or D felony	0.52	0.23–1.21	1.90	0.94–3.85	<b>0.27</b>	<b>0.15–0.51<sup>‡</sup></b>
Class A or B felony	1.00		1.00		1.00	
Maximum sentence, yr	0.98	0.93–1.03	<b>0.91</b>	<b>0.87–0.95<sup>‡</sup></b>	<b>1.08</b>	<b>1.03–1.13<sup>†</sup></b>
<p>OCs = offenders against children; youngest victim &lt; 13 years old            OPs = offenders against adolescents (pubescent minors); youngest victim 13–17 years old            OAs = offenders against adults; youngest victim ≥ 18 years old            AOR = adjusted odds ratio            95% CI = 95% confidence interval</p>						
<p><sup>a</sup>“Sexual intercourse” was defined as “having its ordinary mean-</p>			<p>ing and occurs upon any penetration, however slight.”  <sup>b</sup>“Deviate intercourse” refers to contact between the genitals and either the mouth or the anus.  <sup>c</sup>Less severe offences consisted of disseminated indecent materials, sexual contact, child sex performance, and prostitution offenses versus sexual intercourse, deviate intercourse, kidnapping.  <sup>*</sup><i>p</i> &lt; 0.05, <sup>†</sup><i>p</i> &lt; 0.01, <sup>‡</sup><i>p</i> &lt; 0.001</p>			

fell between the two other groups, although offenders against adults received the longest maximum sentences and offenders against adolescents the least severe convictions and sentences.

Findings were most robust in the bivariate analyses, but even in the more stringent multivariate analyses, where the inter-correlations among variables are taken into account, many findings maintained significance. This suggests that several of these variables uniquely distinguish offenders against children from other offender groups.

Our findings on traits associated with impulsive-aggression are consistent with previous studies which found that pedophiles were older<sup>16,17,25</sup> and had lower rates of hostility and aggression.<sup>12,13</sup> Our findings on traits associated with deviant sexual arousal patterns are also consistent with reports showing lower levels of attempted or completed sexual intercourse<sup>4</sup> in child molesters compared to adult rapists. An elevated rate of male victims has also been reported with pedophiles.<sup>24</sup> Moreover, child molesters who had male victims and a larger number of victims had greater pedophilic response on phallometry,<sup>23</sup> supporting the relationship of these variables to aberrant sexual arousal.

Taken together, the characteristics of the offenders and the offenses in our data support our hypothesis that sexual offenders against children are less impulsive-aggressive than sexual offenders against other age groups. The lesser use of force or weapons provides strong support for this notion and is consistent with past research showing that manipulation, bribery, and other nonviolent means are the most common methods employed in sexual offenses against children.<sup>33</sup> With regard to offender age, bivariate analyses showed a strong relationship between older age and molestation of younger victims. As noted above, previous literature indicates violence and impulsivity tend to decrease with age.<sup>18</sup> As our data suggest, pedophilic behavior may not markedly decrease with age. The significantly higher rate of known victims among child molesters vs. other groups is of note as well and may reflect careful evaluation and planful pursuit of the victim, especially in the absence of violence. It may also reflect a degree of opportunism, however, since known victims may provide easier access than strangers. That offenders against adults have the most severe convictions and longest sentences of the three groups may relate to the greater degree of aggression associated with their offenses.

Our findings also suggest that offenders against children present a distinct pattern of sexual deviance relative to other sex offenders. The data on multiple acts and multiple victims point toward a persistent pattern of aberrant

sexual desire, although this may be confounded by a lower likelihood of immediate arrest with non-violent sex offenders. Likewise, lesser incidence of sexual intercourse and of more severe offenses suggests generally lower invasiveness of pedophilic sexual acts, which may be associated with lower levels of force as well as the physical immaturity of child victims. The greater proportion of male victims and of victims of both genders among offenders against children provides additional support for distinct sexual patterns. This notion is consistent with previous research, in which pedophiles reported more frequent aberrant sexual fantasies<sup>11</sup> and more comorbid paraphilias<sup>9</sup> than did adult rapists. Some investigators posit reduced erotic differentiation in pedophiles,<sup>10,33</sup> with reports of less variation in sexual response to different genders and age groups than shown by either heterosexual or homosexual controls.<sup>10,34</sup> Similarly, molestation of male victims does not necessarily indicate homosexuality as a general orientation. In one study, about two thirds of offenders with male victims showed greater phallometric response to adult women than to adult men.<sup>35</sup> Taken together, the data support our hypotheses that pedophiles are driven more by aberrant sexual arousal, whereas serious sexual offenders against adults are driven more by impulsive-aggression.

A fair amount is known about the neurobiology of impulsive-aggression. Decreased serotonergic tone and reduced function in the frontal lobe, specifically the orbital frontal cortex, have been widely shown to be associated with impulsive and aggressive behavior.<sup>36-40</sup> Likewise there is fairly robust evidence of increased serotonergic tone in compulsive disorders such as obsessive-compulsive disorder, which are characterized by increased harm avoidance and risk aversion.<sup>41,42</sup> In contrast, there is less known about the neurobiological substrates of aberrant sexual arousal. A number of studies have demonstrated general neurobiological or neuropsychological abnormalities in pedophiles relative to control groups,<sup>19,43,44</sup> but these studies fail to differentiate the role of impulsivity or impulsive-aggression from that of aberrant sexual arousal per se. Our own work showed decreased function in the frontal lobe and temporal lobe on PET scanning in pedophiles relative to healthy controls.<sup>8</sup> The temporal lobe has previously been linked to sexual arousal patterns.<sup>45</sup>

As for etiology, abundant data point to multiple risk factors for the development of impulsive-aggression. Environmental factors, such as childhood histories of physical abuse and neglect, chaotic environments, and exposure to social groups where impulsive-aggressive behavior is normative<sup>46,47</sup> are all clear risk factors.

Genetic factors, specifically genes related to serotonergic function<sup>48,49</sup> and monoamine oxidase A (MAO-A) activity,<sup>50,51</sup> have been linked to impulsive and antisocial behavior and specific forms of alcoholism. However, there is a dramatic increase in severity when both environmental and genetic risk factors are present.<sup>50-53</sup>

The etiology of pedophilia is less well researched. One of the most robust findings, however, involves a childhood history of sexual abuse.<sup>20-22</sup> Prevalence rates of childhood sexual abuse range from 30%–100% in studies of child molesters, much higher than those found in control populations.<sup>54</sup> However, almost all studies rely on retrospective reports and there are few prospective data. Consequently, the question of whether premature sexual stimulation can lead to neurodevelopmental changes in sexual arousal patterns is a critical area for future research.

The distinction between impulsive-aggression and aberrant sexual arousal among sexual offenders against different age groups can have significant clinical implications. For example, future research on pedophilia could address ways to reduce hypersexuality, heighten erotic differentiation, and identify neurobiological mechanisms linking childhood sexual abuse to adult pedophilic urges. Since the sexual preferences of individuals with strong pedophilic desires may not be under volitional control, the clinical focus is often on controlling the expression of such desires.<sup>55</sup> Hence further research into psychological and pharmacological interventions to regulate and modify specific sexual responses is indicated, building upon previous work on anti-androgen medications.<sup>56</sup>

In contrast, treatment of rapists of adults might focus more upon both psychological and psychopharmacological approaches to impulse and anger control and on the decoupling of sexual arousal from aggression. Of note, in a meta-analytic study of recidivism in sexual offenders, antisocial traits were the strongest predictor of recidivism in violent sexual (and non-sexual) crime.<sup>15</sup> Such traits are strongly associated with impulsivity and aggression.<sup>18,37</sup> Impulsivity is amenable to treatment with various pharmacological interventions, including anticonvulsants, antipsychotics, and selective serotonin reuptake inhibitors.<sup>57</sup> Behavioral and cognitive techniques commonly used in substance abuse treatment may also be applicable to the treatment of impulsive-aggressive sex offenders. Such techniques include identification of antecedents, behaviors, and consequences, better self-monitoring, and avoiding potential triggers for impulsive behavior.<sup>58</sup> Cognitive-behavioral interventions for anger management are also well established.<sup>59</sup>

Although our conclusions are bolstered by the large sample size and the objective nature of the data, several

limitations should be kept in mind. With regard to race/ethnicity, blacks and Hispanics accounted for 86% of the sample used for the analysis—a disproportionate representation consistent with the general prison population.<sup>60</sup> Although significant differences were found in race/ethnicity distribution across the offender groups, they were not consistent across analyses and were thus much less robust than other findings. This highlights an important caveat concerning research on pedophilia, as many studies include only subjects within the judicial system and thus may be skewed toward low income, minority samples. In addition, our New York City sample may differ in demographic or other characteristics from rural or suburban samples or from those from other urban centers. The effect of such geographic differences could easily be addressed in future research by examining sex offender data from different counties and from different states.

Likewise, it is important to consider the potential impact the legal classification system used in the Sex Offender Registry might have had on the findings. As any sexual contact with a minor constitutes a crime, the threshold for a Level 3 offense is much lower when children are involved than in sexual offenses against adults. Subsequently, the incidence of non-violent sexual contact with adults in which free consent is compromised by exploitation of a power differential will be under-represented in this sample. Thus it is possible that, should the bar for Level 3 offenses be lowered, offenders against adults may look more like offenders against children with regard to use of force, severity of offense, number of victims and acts, and even relationship to the victim. On the other hand, it is unlikely that changes in legal categories would affect the proportion of male victims or victims of both genders. Moreover, it is highly unlikely that violent or highly invasive child molesters would be disproportionately underrepresented in this sample.

In addition, many of the characteristics of sex offenses against children may be a reflection of the age of the victim and not necessarily innate characteristics of the offenders. For example, children are less able to resist offenders and thus, offenses against children less frequently require use of force or weapons. Nonetheless, as very few offenders against children also offended against adults, the effect of the victim's age cannot be distinguished from that of the characteristics of the offenders.

There are additional limitations to consider. Data in the registry depend on the data entry of the judicial system and the registry contained significant amounts of missing data. Data were also restricted to the index offense and contained no information on past offenses. Thus we cannot determine if first time offenders differ from repeat offend-

ers. Nonetheless, of those offenders with more than one victim for the current offense, the overlap between victim age groups was minimal. Only 55 (6.6%) of the subjects had victims in more than one age group. In addition, time from offense to conviction may differ across offenders so that the age at conviction may be unpredictably related to the age at offense. Further, these data included only a select group of sex offenders. Level 1 or 2 sex offenders, currently incarcerated sex offenders, individuals who have inhibited their pedophilic urges, or those who have never been apprehended may all differ from the present sample.

To address these limitations, future research could evaluate the generalizability of our findings to different pedophile populations and to different assessment methodologies. The former would include samples from other sex offender registries, including those that display information on Level 1 and Level 2 offenders. While it is inherently difficult to recruit individuals with pedophilia who are not within the judicial system due to the subjects' risk of self-incrimination, outpatient treatment centers for sexual disorders could potentially provide recruitment sources for individuals who have never acted on their inclinations or who have never been apprehended. Additional assessment techniques could include chart review and psychometric and psychobiological measures (e.g., phallometry or visual reaction time).

One further point involves the distinction between child molesters and pedophiles. Although it is an open question as to the proportion of child molesters who are actually pedophiles (i.e., have a persistent sexual interest in children),<sup>24,61</sup> data on convicted sex offenders offer a critical window through which to research pedophilia. Moreover, as our sample includes only Level 3 sex offenders, the judicial system has deemed this particular sample to be at especially high risk of recidivism, increasing the likelihood that pedophiles are well represented.

Nonetheless, within the context of its limitations, this study has significant strengths. It is based on a very large sample that is representative of an entire city. The data are drawn from legal records and thus are protected from bias due to self-report and self-selection. Further, multivariate statistical analyses allow identification of variables that uniquely contribute to group differences and the clear and robust findings support the identification of specific characteristics of sexual offenders against children.

In conclusion, and in the context of these strengths and limitations, our data support our hypotheses that, relative to offenders against older age groups, sexual offenders against children demonstrate lower levels of impulsivity and aggression and greater levels of aberrant sexual arousal. This finding has important implications for a

clinical understanding of pedophilia and suggests several directions for future research.

## References

- Stein DJ, Black DW, Pienaar W. Sexual disorders not otherwise specified: Compulsive, addictive or impulsive? *CNS Spectr* 2000;5:60-4.
- Kafka M. Sexual impulsivity. In: Hollander E, Stein DJ, eds. *Impulsivity and aggression*. New York: Wiley; 1995:201-28.
- Cohen LJ, Gans SW, McGeoch PG, et al. Impulsive personality traits in male pedophiles versus healthy controls: Is pedophilia an impulsive-aggressive disorder? *Compr Psychiatry* 2002;43:127-34.
- Gebhard PH, Gagnon JH, Pomeroy WB, et al. *Sex offenders*. New York: Bantam Books; 1967.
- Cohen LJ, McGeoch PG, Gans S, et al. Personality impairment in male pedophiles. *J Clin Psychiatry* 2002;63:912-9.
- Greenberg D, Bradford JMW, Curry S. Are pedophiles with aggressive tendencies more sexually violent? *Bull Am Acad Psychiatry Law* 1996;24:225-35.
- Okami P, Goldberg A. Personality correlates of pedophilia: Are they reliable indicators? *J Sex Res* 1992;29:297-328.
- Cohen LJ, Nikiforov K, Watras-Gans S, et al. Heterosexual male perpetrators of childhood sexual abuse: A preliminary neuropsychiatric model. *Psychiatr Q* 2002;73:313-35.
- Abel GG, Osborne C. The paraphilias: The extent and nature of sexually deviant and criminal behavior. *Clin Forens Psychiatry* 1992;15:675-87.
- Freund K, Kuban M. Deficient erotic differentiation in pedophilia: A follow-up. *Arch Sex Behav* 1994;22:619-28.
- McKibben A, Proulx J, Lusignan R, et al. Relationships between conflict, affect and deviant sexual behaviors in rapists and pedophiles. *Behav Res Ther* 1994;32:571-5.
- Armentrout, J, Hauer A. MMPIs of rapists of adults, rapists of children, and non-rapist sex offenders. *J Clin Psychol* 1974;34:330-2.
- Valliant P, Gauthier T, Pottier D, et al. Moral reasoning, interpersonal skills, and cognition of rapists, child molesters and incest offenders. *Psychol Rep* 2000;86:67-75.
- Firestone P, Bradford JM, Greenberg DM, et al. The relationship of deviant sexual arousal and psychopathy in incest offenders, extrafamilial child molesters, and rapists. *J Am Acad Psychiatr Law* 2000;28:303-8.
- Hanson RK, Morton-Bourgon KE. The characteristics of persistent sexual offenders: A meta-analysis of recidivism studies. *J Consult Clin Psychol* 2005;73:1154-63.
- Dickey R, Nussbaum D, Chevouveau K, et al. Age as a differential characteristic of rapists, pedophiles and sexual sadists. *J Sex Marital Ther* 2002;28:211-8.
- Miner M, West MA, Day D. Sexual preference for child and aggressive stimuli: Comparison of rapists and child molesters using auditory and visual stimuli. *Behav Res Ther* 1995;33:545-51.
- Hare RD. *The Hare Psychopathy Checklist-Revised manual*. North Tanawanda, NY: Multi-Health Systems; 1991.
- Cantor JM, Blanchard R, Christensen BK, et al. Intelligence, memory and handedness in pedophilia. *Neuropsychology* 2004;18:3-14.

20. Freund K, Kuban M. The basis of the abused abuser theory of pedophilia: A further elaboration of an earlier study. *Arch Sex Behav* 1994;23:553–63.
21. Seghorn TK, Prentky RA, Boucher RJ. Childhood sexual abuse in the lives of sexually aggressive offenders. *J Am Acad Child Adolesc Psychiatry* 1987;26:262–7.
22. Worling J. Sexual abuse histories of adolescent male sex offenders: Differences on the basis of the age and gender of their victims. *J Abnorm Psychol* 1995;104:610–3.
23. Seto M. The value of phallometry in the assessment of male sex offenders. *Journal of Forensic Psychology Practice* 2001;1: 65–75.
24. Seto M. Pedophilia and sexual offenses against children. *Ann Rev Sex Res* 2004;15:321–61.
25. Greenfield LA. Sex offenses and offenders: An analysis of data on rape and sexual assault. U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, Feb. 1997-NCJ-163392.
26. Hosmer DW, Lemeshow S. *Applied logistic regression*, 2nd edition. New York: Wiley; 2000.
27. Pigott TD. A review of methods for missing data. *Educational Research and Evaluation* 2000;7:353–83.
28. Schafer JL. Multiple imputation: A primer. *Stat Methods Med Res* 1999;8:3–15.
29. Sinharay S, Stern HS, Russell D. The use of multiple imputation for the analysis of missing data. *Psychological Methods* 2001; 6:317–9.
30. SPSS I. *SPSS 11.0 Brief Guide*. Chicago, IL: SPSS; 2001.
31. Royston P. Multiple imputation of missing values: Update. *Stata Journal* 2005;5:188–201.
32. StataCorp. *Stata Statistical Software*, Release 8.2. College Station, TX: Stata Corporation; 2005.
33. Cohen LJ, Galynker I. Clinical features of pedophilia and implications for treatment. *J Psychiatr Pract* 2002;8:1–14.
34. Howard RC, Longmore FJ, Mason PA, et al. Contingent negative variation (CNV) and erotic preference in self-declared homosexuals and in child sex offenders. *Biol Psychiatry* 1994;38:169–81.
35. Marshall WL, Barbaree HE, Butt J. Sexual offenders against male children: Sexual preferences for gender, age of victim, and type of behavior. *Behav Res Ther* 1988;26:383–91.
36. Arora RC, Meltzer HY. Serotonergic measures in the brains of suicide victims: 5-HT<sub>2</sub> binding sites in the frontal cortex of suicide victims and control subjects. *Am J Psychiatry* 1989;146: 730–6.
37. Cohen LJ. Neurobiology of antisociality. In: Stough C, ed. *Neurobiology of exceptionality*. New York: Kluwer Academic/ Plenum Publishers; 2005:107–24.
38. Linnoila M, Virkkunen M, Scheinen M, et al. Low cerebrospinal fluid 5-hydroxyindoleacetic acid concentration differentiates impulsive from nonimpulsive violent behavior. *Life Sci* 1983; 33:2609–14.
39. Soderstrom H, Blennow K, Manhem A, et al. CSF studies in violent offenders. I. 5-HIAA as a negative and HVA as a positive predictor of psychopathy. *J Neural Transm* 2001;108:869–78.
40. Soderstrom H, Hultin L, Tullberg M, et al. Reduced fronto-temporal perfusion in psychopathic personality. *Psychiatry Res* 2002;114:81–94.
41. Insel TR, Mueller EA, Alterman I, et al. Obsessive-compulsive disorder and serotonin: Is there a connection? *Biol Psychiatry* 1985;20:1174–88.
42. Hollander E, Cohen LJ. Psychobiology and psychopharmacology of compulsive spectrum disorders. In: Oldham JM, Hollander E, Skodol AE, eds. *Impulsivity and compulsivity*. Washington, DC: American Psychiatric Press; 1996:143–66.
43. Flor-Henry P, Lang RA, Koles ZJ, et al. Quantitative EEG studies of pedophilia. *Int J Psychophysiology* 1991;10:253–8.
44. Hendricks SE, Fitzpatrick DF, Hartmann K, et al. Brain structure and function in sexual molesters of children and adolescents. *J Clin Psychiatry* 1988;49:108–12.
45. Stein DJ, Hugo F, Oosthuizen P, et al. Neuropsychiatry of hypersexuality. *CNS Spectr* 2000; 5:36–46.
46. Jaffee SR, Moffitt TE, Caspi A, et al. Life with (or without) father: The benefits of living with two biological parents depend on the father's antisocial behavior. *Child Dev* 2003;74:109–26.
47. Jaffee SR, Caspi A, Moffitt TE, et al. Physical maltreatment victim to antisocial child: Evidence of an environmentally mediated process. *J Abnorm Psychol* 2004;113:44–55.
48. Hill EM, Stoltenberg SF, Bullard KH, et al. Antisocial alcoholism and serotonin-related polymorphisms: Association tests. *Psychiatr Genet* 2002;12:143–53.
49. Parsian A, Cloninger CR. Serotonergic pathway genes and subtypes of alcoholism: Association studies. *Psychiatr Genet* 2001; 11:89–94.
50. Kim-Cohen J, Caspi A, Taylor A, et al. MAOA, maltreatment, and gene-environment interaction predicting children's mental health: New evidence and a meta-analysis. *Mol Psychiatry* 2006;11:903–13.
51. Caspi A, McClay J, Moffitt TE, et al. Role of genotype in the cycle of violence in maltreated children. *Science* 2002;297: 851–4.
52. Raine A. Biosocial studies of antisocial and violent behavior in children and adults: A review. *J Abnorm Child Psychol* 2002; 30:311–26.
53. Jaffee SR, Caspi A, Moffitt TE, et al. Nature X nurture: Genetic vulnerabilities interact with physical maltreatment to promote conduct problems. *Dev Psychopathol* 2005;17:67–84.
54. Cohen LJ, McGeoch P, Watras Gans S, et al. Childhood sexual history of twenty male pedophiles vs. twenty-three male healthy controls. *J Nerv Ment Dis* 2002;190:757–66.
55. Fagan PJ, Wise TN, Schmidt CW, Jr, et al. Pedophilia. *JAMA* 2002;288:2458–65.
56. Bradford JM. The neurobiology, neuropharmacology, and pharmacological treatment of the paraphilias and compulsive sexual behaviour. *Can J Psychiatry* 2001;46:26–34.
57. Kavoussi RJ, Coccaro EF. Biology and pharmacological treatment of impulse-control disorders. In: Oldham JM, Hollander E, Skodol AE, eds. *Impulsivity and compulsivity*. Washington, DC: American Psychiatric Press; 1996:119–42.
58. Daley DC, Marlatt GA. Relapse prevention: Cognitive and behavioral interventions. In: Lowinson J, Ruiz P, Millman RB, et al., eds. *Substance abuse: A comprehensive textbook*, 3rd edition. Baltimore, MD: Williams & Wilkins; 1997:458–66.
59. Greene RW, Ablon JS, Martin A. Use of collaborative problem solving to reduce seclusion and restraint in child and adolescent inpatient units. *Psychiatr Serv* 2006; 57:610–2.
60. Pettit B, Western B. Mass imprisonment and the life course: Race and class inequality in U.S. incarceration. *Am Sociol Rev* 2004;69:151–69.
61. Barbaree H, Seto M. Pedophilia: Assessment and treatment. In: Laws DR, O'Donohue W, eds. *Sexual deviance: Theory, assessment, and treatment*. New York: Guilford; 1997:175–93.