

Self-Reported Head Injuries Before and After Age 13 in Pedophilic and Nonpedophilic Men Referred for Clinical Assessment

Ray Blanchard, Ph.D.,^{1,3,4} Michael E. Kuban, M.Sc.,¹ Philip Klassen, M.D.,^{1,3}
Robert Dickey, M.D.,^{1,3} Bruce K. Christensen, Ph.D.,^{2,3} James M. Cantor, Ph.D.,¹
and Thomas Blak, B.A.¹

Received April 25, 2003; revision received June 23, 2003; accepted June 23, 2003

Previous research has found that pedophilic men referred for clinical assessment of their sexual behavior are more likely to report that they suffered head injuries before their 13th birthday than are nonpedophilic men referred for the same purpose. This study investigated whether pedophilic patients are also more likely to report head injuries after their 13th birthday. The 685 participants represented all patients with usable data from a consecutive series of men referred to a clinical laboratory specializing in phallometric assessment of erotic preferences. In addition to phallometric testing, participants were administered a brief neuropsychological test battery and a companion interview, which included questions on head injury, drug abuse, and childhood diagnosis of attention-deficit/hyperactivity disorder. The results showed that the pedophilic patients reported more head injuries before age 13 than did the nonpedophilic patients, but they did not report more head injuries after age 13. The association between pedophilia and childhood head injuries could mean either that subtle brain damage after birth increases a boy's risk of pedophilia, or that neurodevelopmental problems before birth increase a boy's accident-proneness along with his risk of pedophilia. Additional analyses showed that self-reported head injuries before age 13 were associated with attentional problems and with left-handedness; in contrast, head injuries after age 13 were associated with drug abuse and promiscuity. These analyses suggest that, among patients with primary presenting complaints of sexual rather than cognitive problems, childhood head injuries cluster with neuropsychological phenomena, whereas later head injuries cluster with lifestyle variables.

KEY WORDS: ADHD; childhood accidents; drug abuse; handedness; head injury; IQ; neuropsychology; pedophilia; phallometry; sex offenders; sexual abuse.

INTRODUCTION

The term *pedophilia* may be defined as the erotic orientation of persons whose sexual attraction to

prepubescent children exceeds their sexual attraction to pubescent or physically mature persons (Freund, 1981). Similarly, the term *hebephilia* (Glueck, 1955) refers to persons who are most attracted to pubescent children, and the term *teleiophilia* (Blanchard et al., 2000), to persons who are most attracted to physically mature adults.

Previous research has shown that pedophilic men have lower than expected IQs, perhaps as much as two thirds of a standard deviation below the population mean (e.g., Cantor et al., in press). If IQ test scores were the only data available, it might be possible to explain the relatively low intelligence of pedophiles as an artifact of ascertainment bias. According to this explanation, less intelligent

¹Law and Mental Health Program, Centre for Addiction and Mental Health, Toronto, Ontario, Canada.

²Schizophrenia and Continuing Care Program, Centre for Addiction and Mental Health, Toronto, Ontario, Canada.

³Department of Psychiatry, Faculty of Medicine, University of Toronto, Toronto, Ontario, Canada.

⁴To whom correspondence should be addressed at Law and Mental Health Program, Centre for Addiction and Mental Health—Clarke Site, 250 College Street, Toronto, Ontario, Canada M5T 1R8; e-mail: ray_blanchard@camh.net.

pedophiles are more likely to be apprehended (or be unable to afford the best lawyers), therefore convicted pedophiles will have lower mean IQs. One additional finding, however, argues against this interpretation. Bogaert (2001) found evidence that pedophilia is related to left-handedness. Cantor et al. (in press) confirmed this relation and showed that it remained significant after controlling for IQ. One might plausibly argue that less intelligent pedophiles are more likely to be apprehended, but one cannot plausibly argue that left-handed pedophiles are more likely to be apprehended. It therefore appears that some other explanation is needed, one that can account for the association of pedophilia with left-handedness as well as below-average IQ.

Both low IQ and left-handedness are nonspecific indicators of perturbations in prenatal neurodevelopment (see review in Blanchard et al., 2002). Thus, the fact that pedophilia is associated with left-handedness and with poor cognitive functioning—two variables that are causally related to neurodevelopment—suggests that pedophilia may also be causally related to neurodevelopment. It is possible, in other words, that correlations exist among pedophilia, left-handedness, and poor cognitive functioning, because neurodevelopmental problems during prenatal life predispose a male to develop all three.

The possibility that neurodevelopmental problems before birth may increase a male's risk of pedophilia does not preclude the possibility that neurodevelopmental problems after birth may also increase the risk of pedophilia. Evidence that postnatal problems might increase this risk was produced by Blanchard et al. (2002), who found, in two separate samples, that pedophilic men referred for clinical assessment of their sexual behavior are more likely to report that they suffered head injuries before their 13th birthday than are nonpedophilic men referred for the same purpose.

This study was conducted to confirm the foregoing finding with a third sample and also to investigate whether pedophilic patients are more likely to report head injuries after their 13th birthday. We reasoned that if head injuries increase a male's risk of pedophilia, pedophiles should report more head injuries than do comparison participants before age 13, but not after age 13. This prediction was based on current knowledge regarding the course of neurodevelopment. Certain aspects of brain development continue into adulthood; however, most neurological maturation is completed during childhood (see review in Blanchard et al., 2002). If head injuries can cause pedophilia—a complex, integrated, purposive behavior—then they are more likely to produce this effect during childhood, when brain organization is more vulnerable to developmental perturbations.

METHOD

Participants

The participants came from the 752 male patients who presented at the Kurt Freund Laboratory at the Clarke Site of the Centre for Addiction and Mental Health (Toronto, Ontario, Canada) between January 19, 2000, and December 31, 2002. In every case, the presenting complaint concerned illegal or disturbing sexual behavior, and the primary purpose of the referral was psychophysiological assessment of the patient's erotic preferences. The majority of patients were referred by parole and probation officers, lawyers, correctional institutions, and children's protective societies. Patients who had no involvement with the criminal justice system were referred by physicians. These included, for example, patients who were unsure about their sexual orientation, patients concerned about hypersexuality or "sex addiction," patients experiencing difficulties because of their excessive use of telephone sex lines or massage parlors, and clinically obsessional patients with intrusive thoughts about unacceptable sexual behavior.

About 9% of the patients who presented were not included in this study. These included patients with inadequate English-language skills, active psychosis, or mental retardation too severe to permit cognitive assessment with our neuropsychological test battery. A few patients declined neuropsychological assessment although they agreed to sexualological assessment, and a few declined to sign an IRB-approved consent form allowing their clinical assessment data to be used for research purposes. Patients were also excluded if there was no available information regarding their sexual history or inclinations beyond their own self-report at the time they presented at the Laboratory. Finally, 7 patients were excluded because they had previously been assessed at the Laboratory and their data had been used in the head injury study by Blanchard et al. (2002). This left 685 participants who had data usable for at least one analysis in this study. Of these, 462 had been included in the study of cognitive functioning and handedness by Cantor et al. (in press).

As would be expected from the above-mentioned referral sources, the majority of patients had one or more sexual offenses. The phrase *sexual offenses*, in this paper, includes charges, convictions, credible accusations, and self-disclosures of criminal sexual behavior. *Credible accusations* were defined by default, that is, all accusations excepting those that were made by an individual who stood to gain in some way from criminal charges against the accused, that had no corroborating evidence, and that were not voiced at the time the alleged offense or offenses

occurred. Only a small proportion of accusations were not considered credible; typical examples were allegations, not followed by criminal charges, from estranged spouses in custody-and-access disputes.

The participants comprised approximately 15% with no known sexual offenses, 54% with offenses against children under age 12, 30% with offenses against pubescents aged 12–14, 16% with offenses against teenagers aged 15–16, and 29% with offenses against adults aged 17 and older. These percentages add up to more than 100, because many patients had offenses against victims in more than one age range. No distinction was made, in this research, between offenses against related victims (“incest offenses”) and offenses against unrelated victims. Offenses against adult victims included some that involved physical contact (e.g., rape, frotteurism) and others that did not (e.g., exhibitionism, voyeurism, obscene telephone calling). Paraphilic behaviors that did not entail criminal acts included masochism, fetishism, and transvestism.

The mean age of the patients was 38.65 years ($SD = 13.66$). The mean and median educational level was high school graduation. The patients were predominantly of European descent, with 79% describing themselves as White, 3% as Asian, 7% as Black, 3% as Southeast Asian, 2% as Aboriginal Canadian, 1% as Filipino or Pacific Islander, and 4% as “other,” which included mixed ancestry.

Materials and Measures

Sexual History

A standardized form, which has been employed in the Kurt Freund Laboratory since 1995, was used to record the patient’s history of sexual offenses. Most of that information came from objective documents that accompanied his referral, for example, reports from probation and parole officers. The offense-history data were cross-checked against, and supplemented by, two other kinds of information provided by the patient himself. The first of these was the number and nature of any additional sexual offenses that were admitted by the patient but for which he was never charged. The second was his number of consenting adult sexual partners, including prostitutes. The patient’s information was solicited by the laboratory manager in a structured sexual-history interview immediately before or after psychophysiological testing.

Several quantitative variables from the patient’s sexual history were utilized in this study. These were his total numbers of victims under age 12, victims aged 12–14, victims aged 15–16, victims aged 17 and older, and male and female consenting sexual partners aged 17 and older.

Scores on these variables were capped at 10. Thus, for example, if a patient had been convicted of molesting 7 children aged 12–14, was charged with molesting another 4, and admitting that he had molested another 5 for which he was never apprehended, then his total number of victims aged 12–14 was 10, not 16. These scores were capped at 10 because larger numbers of victims were often estimates rather than precise quantities, and because various pilot studies using this database indicated that values above 10 primarily added error variance.

Phallometric Measurement of Erotic Gender–Age Preferences

Psychophysiological assessment consisted of phallometric testing, a procedure for assessing erotic interests in male adults and adolescents. In this procedure, the examinee’s penile blood volume is monitored while he is presented with a standardized set of laboratory stimuli depicting a variety of potentially erotic activities or objects. The examinee’s penile blood volume increases (i.e., degrees of penile erection) are taken as an index of his relative attraction to the different classes of stimuli.

The Kurt Freund Laboratory is equipped for volumetric phallometry, that is, the apparatus measures penile blood volume change rather than penile circumference change. The volumetric method measures penile tumescence more accurately at low levels of response (Kuban, Barbaree, & Blanchard, 1999). A photograph and schematic drawing of the volumetric apparatus are given in Freund, Sedlacek, and Knob (1965). The major components include a glass cylinder that fits over the penis and an inflatable cuff that surrounds the base of the penis and isolates the air inside the cylinder from the outside atmosphere. A rubber tube attached to the cylinder leads to a pressure transducer, which converts air pressure changes into voltage output changes. Increases in penile volume compress the air inside the cylinder and thus produce an output signal from the transducer. The apparatus is calibrated so that known quantities of volume displacement in the cylinder (e.g., 2 cc) correspond to known changes in transducer voltage output. The apparatus is very sensitive and can reliably detect changes in penile blood volume much less than 1 cc.

The specific test used in this study has been described in detail by Blanchard, Klassen, Dickey, Kuban, and Blak (2001). The test stimuli are audiotaped narratives presented through headphones and accompanied by slides. There are seven categories of narratives, which describe sexual interactions with prepubescent girls, pubescent girls, adult women, prepubescent boys, pubescent boys,

and adult men, and also solitary, nonsexual activities (“neutral” stimuli). The accompanying slides show nude models corresponding in age and sex to the topic of the narrative. Neutral narratives are accompanied by slides of landscapes. The time required to complete a test is usually about 1 hr. An elaborate process of data reduction, which is outlined by Blanchard et al. (2001), yields seven category scores, which summarize the participant’s penile responses to stimuli in the different categories; these are taken as measures of his relative erotic interest in adult women, pubescent girls, and so on.

There were 145 patients for whom phallogometric test results were not available. There was a variety of reasons for this. Some patients declined to undergo any phallogometric testing. In other cases, the presenting complaint suggested giving the patient a phallogometric test that was different from the one included in this study. For another group of patients, the phallogometric test results were invalid because there were technical difficulties with the test, because the patient was grossly uncooperative despite his verbally stated willingness to undergo testing, or because the patient failed to respond to the test stimuli. The nature and prevalence of such problems have been discussed in detail elsewhere (Blanchard et al., 2001).

Measures of Cognitive Functioning

The patients’ sexological assessments were supplemented by a brief neuropsychological screening battery, which included six subtests from the WAIS-R. The WAIS-R was used rather than the newer WAIS-III because there was little or no clinical advantage, for our purposes, in using the WAIS-III, and because the factorial structure of the WAIS-R is better established.

Pairs of the WAIS-R subtests were used to compute three scores that measure the different aspects of intellectual ability as identified by factor-analytic studies of the WAIS-R (e.g., Cohen, 1957a, 1957b). The research used the subtests recommended by Hamsher (1990) for computing these scores. The Verbal Comprehension IQ was computed from the Information and Similarities subtests. This index measures verbal knowledge and understanding as well as verbal conceptual ability and reflects the ability to apply verbal skills to new situations. In addition to poor verbal comprehension, low scores might indicate poor concept formation or inadequate understanding of the cultural milieu (Sattler, 1988). The Perceptual Organization IQ was computed from the Block Design and Picture Completion subtests. This index reflects the ability to interpret and organize visually perceived material while working against a time limit. Low scores might indi-

cate poor spatial ability, poor nonverbal reasoning, or poor alertness to detail (Sattler, 1988). The Freedom from Distractibility (sometimes called Attention–Concentration) IQ was computed from the Arithmetic and Digit Span subtests. This index measures the ability to attend or concentrate as well as numerical proficiency and the ability to use rehearsal strategies. The deviation IQ scores (sometimes called *DQs*) for general intelligence, Verbal Comprehension, Perceptual Organization, and Freedom from Distractibility were calculated using the method and computational formulas presented by Tellegen and Briggs (1967).

Handedness was assessed with a revised version of the Edinburgh Handedness Inventory (Oldfield, 1971; Williams, 1986). Patients were asked which hand they used for the following objects or activities: writing, drawing, throwing, striking a match, lifting the lid of a box, and using a scissors, toothbrush, knife, and spoon. A 10th item, which asked about hand-placement in using a broom, was discarded because a preliminary factor analysis showed that it correlated poorly with the other items. The items were scored “1” if the patient used his right hand only, “2” if he used either hand on occasion, and “3” if he used his left hand only. Therefore total scores could run from 9 (denoting *exclusive use of the right hand*) to 27 (denoting *exclusive use of the left hand*).

The neuropsychological screening battery was accompanied by a second structured interview, which was designed by two of the authors (J.M.C. and B.K.C.) to canvass related aspects of the patient’s history. Of present relevance are the sections pertaining to head injuries, drug abuse, and attention-deficit/hyperactivity disorder (ADHD).

The patient’s recall of head injuries was prompted with a series of questions: (a) Have you ever had an x-ray? What parts of the body? (b) Have you ever had a CAT scan, PET scan, MRI, or brain scan? (c) Do you have any scars on your head? Where? (d) Were you ever knocked unconscious during your childhood, for example, falling from a tree or hitting your head in a hockey game? (e) Were you ever knocked unconscious in adulthood, for example, in a car accident or in a sports injury?

For each recalled head injury, the interviewer asked the patient for the age at which this occurred, the estimated duration of unconsciousness (in minutes), and the number of days the patient was hospitalized for that injury. The patient’s first (i.e., earliest) head injuries producing unconsciousness were recorded, up to a maximum of three such injuries. These included all episodes in which the patient reported some duration of unconsciousness, even if this was a matter of seconds rather than minutes, hours, or days. Duration of hospitalization was zero for the vast

majority of injuries, and this variable was not used in this study.

From these data, we computed two variables: The number of times the patient was knocked unconscious before his 13th birthday, and the number of times he was knocked unconscious after his 13th birthday. Because the interview protocol allowed for recording no more than three head injuries, the patient's combined score on the two variables could not exceed that number, although there was no restriction on whether the maximum three injuries were all in the same age range or distributed between the two age ranges. It is conceivable that the cap on the total number of head injuries that could be recorded might have produced an artifactual negative correlation between the two head injury variables. As shown later, that did not occur.

The patient's history of drug abuse was assessed in regard to 13 substances: marijuana, barbiturates, nasal (i.e., "snorted") heroin or morphine, intravenous heroin or morphine, methadone, nasal cocaine, intravenous cocaine, "crack" cocaine, oral amphetamines, intravenous amphetamines, inhalants, benzodiazapines, and hallucinogens. Several parameters of use were recorded for each of these drugs. For this study, we used only one: the frequency with which the patient used the drug during the period of heaviest use in his lifetime. This was recorded on a 7-point scale that ranged from "never" to "several times per day." We computed a crude, but serviceable, global index of drug abuse by simply adding up the patient's scores for the 13 drugs.

The patient's self-reported history of having been diagnosed with ADHD was recorded dichotomously as present or absent. Uncertain responses were clarified by asking the patient if he had ever received medication for this problem.

Procedure

The phallometric tests were administered by a laboratory manager with long experience in the Kurt Freund Laboratory. The neuropsychological test battery was administered by a combination of Ph.D. level psychologists and a series of clinical psychology interns and practicum students working under a psychologist's supervision.

Phallometric testing was usually conducted before neuropsychological assessment, but this order was often reversed for various reasons of scheduling convenience. In no instance was the psychologist or psychology student who conducted the neuropsychological assessment aware of the nature of the patient's offenses or presenting complaint at the time of that assessment.

RESULTS

In the first phase of data analysis, patients were divided into three discrete groups. The basis of this classification was phallometric data, with self-report data used as alternative, and offense-history data as confirmatory sources of information.

A patient was classified as pedophilic if he responded more, on the phallometric test, to prepubescent boys or girls than he did to persons in any other gender-age category, or if he lacked a valid phallometric test but stated that he was more attracted to prepubescent boys or girls than he was to persons in any other gender-age category.

A patient was, similarly, classified as hebephilic if he responded more to pubescents than he did to prepubescent or adult persons, or if he lacked a valid phallometric test but stated that he was more attracted to pubescents than to prepubescent or adult persons.

The classification of a patient as teleiophilic was made more stringent by the addition of a second criterion. This was done because teleophilia is the socially and psycholegally desirable diagnosis, and many pedo- and hebephilic patients endeavor, both in interview and in their phallometric testing, to obtain it (see Blanchard et al., 2001). The first criterion was that the patient responded more, on the phallometric test, to adult men or women than he did to persons in any other gender-age category, or else he lacked a valid phallometric test but stated that he was more attracted to persons past their 17th birthday than to younger persons. The second, confirmatory criterion was that the patient lacked any history that might contradict his phallometric results or self-report, specifically, any known sexual offenses against male or female victims under the age of 17.

There were 257 patients who could not be classified according to the foregoing rules, either because the patient had missing data ($n = 12$), or because the patient's phallometric diagnosis or self-report as teleiophilic was disqualified by an offense-history that included underage victims ($n = 245$). Of the remaining 428, 70 were classified as pedophiles, 225 as hebephiles, and 133 as teleiophiles.

Figure 1 shows the percentages of pedophiles, hebephiles, and teleiophiles who reported one, two, or three head injuries before age 13. The pedophiles were the most likely to report head injuries, and the teleiophiles were the least likely. Because the pedophiles, hebephiles, and teleiophiles could reasonably be considered an ordered set, the relation between erotic age-preference and number of head injuries was tested using a Spearman rank-order correlation coefficient. The correlation was $r_s(428) = .12$, $p = .01$. (This significance value, like all others reported in this paper, is two-tailed.)

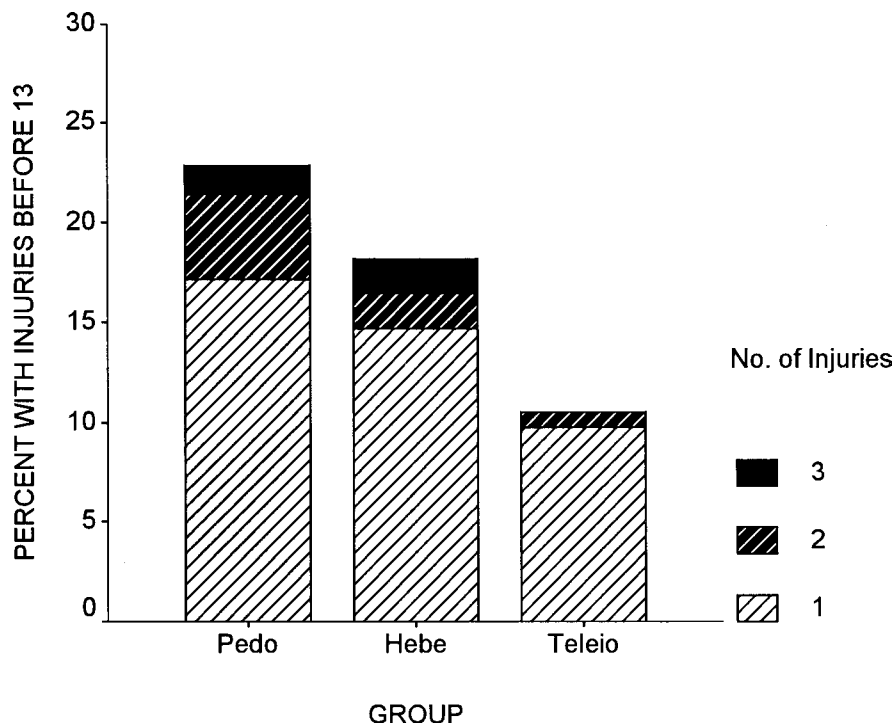


Fig. 1. Percentages of pedophiles, hebephiles, and teleiophiles who reported one, two, or three head injuries before their 13th birthdays.

The percentages who reported one, two, or three head injuries after age 13 are shown in Fig. 2. The differences between the groups were small and not statistically significant, $r_s(428) = -.02$, $p = .66$.

The second phase of data analysis comprised a series of multiple regression analyses that were intended to clarify the meaning of earlier and later head injuries. Each analysis used a different criterion variable but the same three predictors: the patient's age at assessment, his number of head injuries before age 13, and his number of head injuries after age 13. All of these multiple regression analyses were linear regressions except for the one involving the dichotomous variable, ADHD, which was a logistic regression. The results are shown in Table I.

Included in Table I are the numbers of participants in each analysis. These vary for different reasons. In the analyses of the three WAIS IQ measures, we included only those participants who were born in an English-speaking country or else immigrated to an English-speaking country before age 6. The purpose of this was to reduce extraneous variance related to language fluency. In the logistic regression analysis of ADHD, we included only those participants whose age at assessment was less than 36, because this diagnosis would have been uncommon or nonexistent during the childhoods of the older men in the sample.

Other, minor fluctuations in sample size were caused by missing data.

All three of the IQ measures were positively associated with age. This probably reflects the structure of the sample, because these measures were already adjusted according to age norms. It is possible, for example, that this finding represents a kind of survival function; the more intelligent a sex offender is, the longer he can evade arrest and conviction.

The Attention-Concentration IQ was negatively associated with number of head injuries before age 13; that is, individuals who reported more head injuries in childhood showed a lesser ability to concentrate (or a greater distractibility). This result was consistent with the next analysis, which showed that the odds of a patient reporting ADHD were almost tripled by each additional injury before age 13 (see Table I, footnote "b").

Older patients were less likely to be left-handed (or ambidextrous). This is a common finding (see Coren & Halpern, 1991), which may reflect a shorter life-expectancy of left-handed persons. Left-handedness was significantly more common among patients who reported head injuries before age 13, but this variable was not significantly related to head injuries after age 13.

The number of prepubescent children against whom the patient had committed sexual offenses was positively

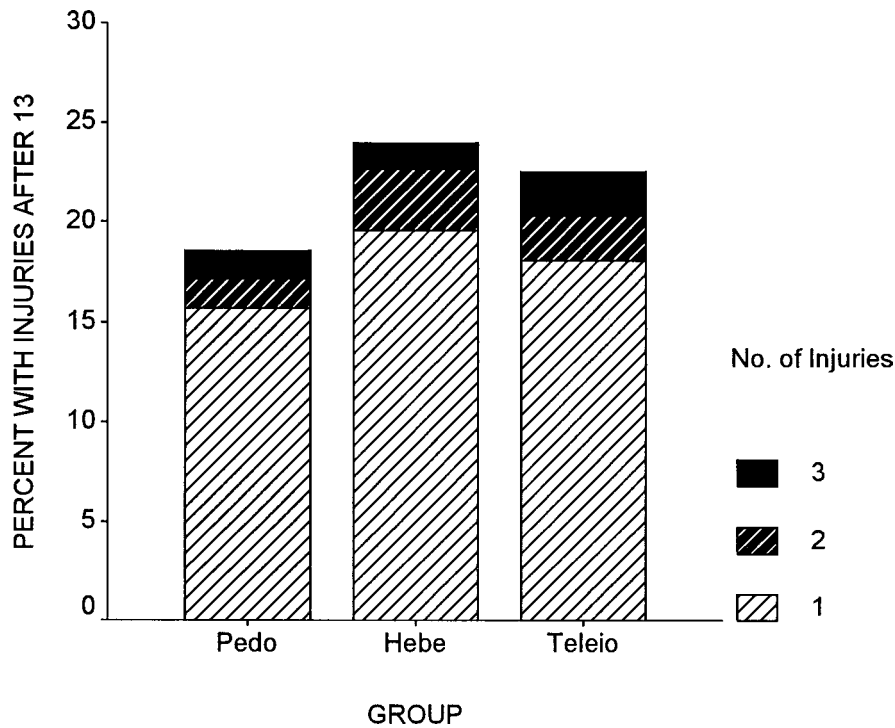


Fig. 2. Percentages of pedophiles, hebephiles, and teleiophiles who reported one, two, or three head injuries after their 13th birthdays.

associated with his number of head injuries before age 13. This finding is essentially a confirmation of the results from the first phase of data analysis, but using a different indicator of erotic attraction to children. Number of child victims showed almost zero association with number of

head injuries after age 13. Number of adult victims did not relate to any of the predictor variables.

Number of consenting adult male sexual partners and number of consenting adult female sexual partners both related positively to age, as would be expected in almost

Table I. Coefficients From Multiple Regression Analyses to Clarify Meaning of Head Injuries Before and After Age 13

Criterion	N	Predictors		
		Age at testing	Injuries before 13	Injuries after 13
Verbal Comprehension IQ	555	0.19***	-0.06	-0.02
Perceptual Organization IQ	550	0.11*	-0.01	0.04
Attention-Concentration IQ	554	0.13**	-0.12**	0.00
ADHD in childhood ^{a,b}	284	-0.10**	1.01***	0.11
Left-handedness	679	-0.11**	0.09*	-0.05
Number of child victims	668	0.06	0.10*	-0.01
Number of adult victims	668	-0.02	-0.01	0.05
Number of consenting adult male partners	668	0.08*	0.00	0.03
Number of consenting adult female partners	667	0.15***	0.01	0.25***
Drug abuse	641	-0.08*	0.07	0.30***

^aThe regression coefficients from this logistic regression analysis may be compared in sign, but not in magnitude, to the coefficients from the linear regression analyses.

^bThe odds ratios corresponding to the regression coefficients, e^B , are 0.90, 2.74, and 1.12 for age at testing, injuries before 13, and injuries after 13, respectively.

* $p < .05$. ** $p < .005$. *** $p < .0005$.

any sample. (An individual's cumulative lifetime number of sexual partners can increase with age, but it can never decrease.) Number of adult female partners, however, also related positively to head injuries after 13; that is, patients who reported consensual sex with greater numbers of women also reported more head injuries after their 13th birthday.

The global index of drug abuse was negatively related to the patient's age at assessment; this result, like the age results for the IQ measures, probably reflects something about the structure of the sample. Drug abuse was substantially related to number of head injuries after age 13; the more drug abuse a patient reported, the more head injuries he reported. In contrast, drug abuse did not relate to head injuries before age 13.

It is noteworthy that the correlations among the predictor variables in the multiple regression analyses were quite small in absolute terms and statistically nonsignificant despite the large sample size. In the full sample of 685 participants, the correlation between the patient's age at assessment and his number of head injuries before age 13 was $-.02$, the correlation between the patient's age at assessment and his number of head injuries after age 13 was $.04$, and the correlation between his number of head injuries before age 13 and his number of head injuries after age 13 was $.06$. Thus, the coefficients from the linear regression analyses were nearly identical to the corresponding correlation coefficients, which are not reported here.

DISCUSSION

The results showed that the pedophilic patients reported more head injuries before age 13 than did the nonpedophilic patients, but they did not report more head injuries after age 13. Between this study and the previous one by Blanchard et al. (2002), the association between pedophilia and childhood head injuries has now been shown in three nonoverlapping samples, totaling 1,891 individuals.

Blanchard et al. (2002) discussed the considerable limitations of self-report methodology in studying pedophilia and head injuries. They noted, among other things, the possibility that many pedophiles claim head injuries that never occurred, or grossly exaggerate memorable but minor occurrences, as a way of diminishing responsibility for their sexual conduct toward children. This possibility is rendered a little less likely by the finding that pedophiles report head injuries before age 13, when brain development is still progressing, but not after age 13, when brain development has slowed or stopped. It seems improbable that pedophilic patients, with a median edu-

cation of high school graduation and a mean IQ around 90 (see Cantor et al., in press) would be sophisticated enough to fabricate self-reports in accordance with current thinking on neurodevelopmental plasticity. Why, in the absence of a neurodevelopmental theory, would a child molester arrested in adulthood think that a head injury 20 years before would be a better excuse than a head injury 2 years before?

The finding that the rate of childhood head injury reported by the hebephiles was intermediate between that reported by the pedophiles and the teleiophiles parallels the findings that hebephiles are intermediate in IQ, verbal memory, visual memory, and sinistrality (Cantor et al., in press). These results demonstrate the potential usefulness of separating hebephiles from pedophiles, when numbers of research participants permit. That research strategy might some day contribute to our taxonomic knowledge of erotic age-preferences, which is at present very incomplete. It is clear, for example, that there exist men who are more attracted to pubescents than they are to younger or older persons, but what do such men—hebephiles—really represent? Are they pedophiles oriented toward the oldest possible children, teleiophiles oriented toward the youngest possible sexually mature persons, men with some third orientation that is etiologically distinct from both pedophilia and teleiophilia, or a mixture of all three? Separating hebephiles from pedophiles in future neuropsychological studies might help to address these questions.

Additional analyses of the present data showed that self-reported head injuries before age 13 correlated with attentional problems and with left-handedness; in contrast, head injuries after age 13 correlated with drug abuse and promiscuity. These analyses suggest that, among patients with primary presenting complaints of sexual rather than cognitive problems, childhood head injuries cluster with neuropsychological phenomena, whereas later head injuries cluster with lifestyle variables. The latter conclusion was based on our consideration of the most likely factor that could pull together adult head injuries, drug abuse, and promiscuity. It seemed to the present writers that this factor would be lifestyle, specifically, an antisocial or quasi-antisocial lifestyle involving heavy drug use, heterosexual promiscuity, and reckless exposure to physically dangerous situations. Other causal models, in contrast, account for only some of the correlations, seem less plausible, or both. Head injuries suffered in adulthood, for example, dispose some patients to make impulsive, inappropriate sexual advances to almost anyone in their environment, but they hardly increase a man's success rate in obtaining willing female partners. Drug abuse could conceivably increase a man's risk of accidental head injuries, but it is unclear how drug abuse per se could increase a

man's number of consenting female partners. It is true that long-term drug abuse might put a man in situations where consenting partners are readily available, such as "crack houses" where women trade sex for cocaine, but that example again argues for a lifestyle factor.

The reliability of the correlation between pedophilia and childhood head injuries appears to be settled, but its exact interpretation is not. Blanchard et al. (2002) have argued that this correlation could mean either (a) that subtle brain damage after birth increases a boy's risk of pedophilia, or (b) that neurodevelopmental problems before birth increase a boy's accident-proneness along with his risk of pedophilia. The choice between these interpretations cannot be based on the rather small size of the correlation between childhood head injuries and indicators of pedophilia (e.g., number of offenses against children; see Table I). It is true that a small correlation would weigh against any notion that childhood head injuries account for a large proportion of cases of pedophilia. A small correlation, however, is equally compatible with the hypothesis that childhood head injury is only one among numerous causes of pedophilia and with the hypothesis that accident-proneness and pedophilia correlate merely because both are sequelae of prenatal events.

The choice of interpretations might be made by investigating whether pedophiles are more likely to report other kinds of childhood accidents, ones not involving the head, for example, broken arms or legs, cuts requiring stitches, or burns requiring clinical attention. If childhood head injuries cause pedophilia, then pedophiles should report more head injuries than do comparison participants, but not more accidents involving other parts of the body. If prenatal, neurodevelopmental problems cause both pedophilia and accident-proneness, then pedophiles should report more childhood accidents of all types. It should be noted that both interpretations imply that neurodevelopmental perturbations increase a male's risk of pedophilia. They differ primarily in the timing of the perturbation and the exact role played by childhood head injuries.

ACKNOWLEDGMENTS

This research was supported by Social Sciences and Humanities Research Council of Canada Grant 410-99-0019 to Ray Blanchard and by a postdoctoral fellow-

ship award from the CAMH Foundation and the Ontario Ministry of Health to James M. Cantor.

REFERENCES

- Blanchard, R., Barbaree, H. E., Bogaert, A. F., Dickey, R., Klassen, P., Kuban, M. E., et al. (2000). Fraternal birth order and sexual orientation in pedophiles. *Archives of Sexual Behavior, 29*, 463–478.
- Blanchard, R., Christensen, B. K., Strong, S. M., Cantor, J. M., Kuban, M. E., Klassen, P., et al. (2002). Retrospective self-reports of childhood accidents causing unconsciousness in phallometrically diagnosed pedophiles. *Archives of Sexual Behavior, 31*, 511–526.
- Blanchard, R., Klassen, P., Dickey, R., Kuban, M. E., & Blak, T. (2001). Sensitivity and specificity of the phallometric test for pedophilia in nonadmitting sex offenders. *Psychological Assessment, 13*, 118–126.
- Bogaert, A. F. (2001). Handedness, criminality, and sexual offending. *Neuropsychologia, 39*, 465–469.
- Cantor, J. M., Blanchard, R., Christensen, B. K., Dickey, R., Klassen, P. E., Beckstead, A. L., et al. (in press). Intelligence, memory, and handedness in pedophilia. *Neuropsychology*.
- Cohen, J. (1957a). A factor-analytically based rationale for the Wechsler Adult Intelligence Scale. *Journal of Consulting Psychology, 21*, 451–457.
- Cohen, J. (1957b). The factorial structure of the WAIS between early adulthood and old age. *Journal of Consulting Psychology, 21*, 283–290.
- Coren, S., & Halpern, D. F. (1991). Left-handedness: A marker for decreased survival fitness. *Psychological Bulletin, 109*, 90–106.
- Freund, K. (1981). Assessment of pedophilia. In M. Cook & K. Howells (Eds.), *Adult sexual interest in children* (pp. 139–179). London: Academic Press.
- Freund, K., Sedlacek, F., & Knob, K. (1965). A simple transducer for mechanical plethysmography of the male genital. *Journal of the Experimental Analysis of Behavior, 8*, 169–170.
- Glueck, B. C. (1955). *Final report: Research project for the study and treatment of persons convicted of crimes involving sexual aberrations, June 1952 to June 1955*. New York: New York State Department of Mental Hygiene.
- Hamsher, K. deS. (1990). Specialized neuropsychological assessment methods. In G. Goldstein & M. Hersen (Eds.), *Handbook of psychological assessment* (2nd ed., pp. 256–279). New York: Pergamon Press.
- Kuban, M. E., Barbaree, H. E., & Blanchard, R. (1999). A comparison of volume and circumference phallometry: Response magnitude and method agreement. *Archives of Sexual Behavior, 28*, 345–359.
- Oldfield, R. C. (1971). The assessment and analysis of handedness: The Edinburgh Inventory. *Neuropsychologia, 9*, 97–113.
- Sattler, J. M. (1988). *Assessment of children* (3rd ed.). San Diego, CA: Jerome M. Sattler.
- Tellegen, A., & Briggs, P. F. (1967). Old wine in new skins: Grouping Wechsler subtests into new scales. *Journal of Consulting Psychology, 31*, 499–506.
- Williams, S. M. (1986). Factor analysis of the Edinburgh Handedness Inventory. *Cortex, 22*, 325–326.