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Peer Briken,[1] *M.D.; Niels Habermann,*[1] *M.A.; Martin P. Kafka,*[2] *M.D.; Wolfgang Berner,*[1] *M.D.; and Andreas Hill,*[1] *M.D.*

The Paraphilia-Related Disorders: An Investigation of the Relevance of the Concept in Sexual Murderers*

ABSTRACT: Paraphilic disorders (PAs) and sexual preoccupation are known risk factors for recidivism in sexual offenders. Nonparaphilic sexual excessive behaviors—so-called paraphilia-related disorders (PRDs), like paraphilias, are also characterized by sexual preoccupation and volitional impairment and can be diagnosed in paraphilic men. The prevalence and clinical significance of PRDs in sexual homicide perpetrators, however, is unknown. We investigated the relationship between PAs and PRDs retrospectively in a sample of 161 sexual murderers. Four groups were compared: men without a PA or a PRD diagnosis, men with at least one PRD but no PA, men with at least one PA but no PRD, and finally, those with a combination of both (PA+PRD). The PA+PRD group had the most lifetime cumulative sexual impulsivity disorders, more developmental problems, the highest persistent frequency of sexual activity, the highest number of previous sexual offences, more sexual sadism, and compulsive masturbation. Men of the PRD subsample had suffered more from childhood sexual abuse, showed more promiscuity, psychopathy, and alcohol problems. The use of the PRD concept in this special offender group should be further investigated with prospectively designed studies.

KEYWORDS: forensic science, forensic psychiatry, sexual homicide, paraphilia, paraphilia-related disorders, sexual offender

Paraphilias as well as nonparaphilic sexual behaviors that cause personal or interpersonal distress in association with an increased frequency or intensity have been characterized as impulsive, compulsive, or addictive (1). On a continuum of sexual expression, the line between subclinical problematic sexual behaviors and a clinical syndrome or diagnosis for these nonparaphilic behavioral patterns seems to be less clearly demarcated than for paraphilias, and the relationship between nonparaphilic sexual impulsivity disorders (SIDs) and sex offending is not clearly understood.

In the German-speaking countries the terminology for an addictive sexual behavior has a long tradition following von Krafft-Ebing's (2) description of the so-called "Hyperesthesia sexualis" showing similarities to morphinism or alcoholism. Giese (3), the most prominent German sex researcher at his time, considered an addictive course for the diagnostic guidelines of perversions (in that time synonymously used for paraphilias). Schorsch (4), who empirically investigated addictive or progressive forms of perversions, reported them only to be relevant in a subgroup of about 20% of sexual offenders. The descriptive use of terminology such as "addictive" or "progressive" for perversions was found to be useful for juridical decisions of criminal responsibility and is still integrated into the German penal code.

In an American sample, Delmonico and Griffin (5) compared "sexually addicted" offenders with nonaddicted sex offenders. The former group had higher numbers but less intrusive offences, engaged in rituals around offense behaviors rather than in impulsive actions, had a higher level of shame about the offense behavior, made greater use of pornography, had a higher incidence of concomitant substance abuse, and felt unworthy and out of control. In contrast, nonaddicted offenders reported more negative affects, including anger, frustration, and hatred, and were more likely to have a history of child sexual abuse or a sexualized home environment.

Kafka (6) and Kafka and Hennen (7,8) described the concept of paraphilia-related disorders (PRDs), which they defined as "sexually arousing fantasies, urges or activities that are culturally sanctioned aspects of normative sexual arousal and activity that increase in frequency or intensity (for more than 6 months duration) so as to preclude or significantly interfere with the capacity for reciprocal affectionate activity." PRDs include compulsive masturbation, protracted promiscuity, pornography and telephone-sex dependence, severe sexual desire incompatibility, and cybersex dependence. In contrast with paraphilias, a group of sexual conditions characterized by deviant sexual arousal, PRDs were characterized as disinhibited or excessive expressions of adult heterosexual or homosexual object choice.

PRDs can occur as distinct disorders or in comorbid relationship with paraphilias. For example, in a sample of 120 outpatients Kafka and Hennen (9) compared men with paraphilic disorders (PAs) to men with PRDs. In the PA group, almost all of whom also had lifetime PRD diagnoses as well, they found significantly more physical abuse histories, lower education levels, more school, learning and work problems, previous psychiatric hospitalizations, and convictions for both sexual and nonsexual offences. When the sample was statistically controlled for incidence of attention-deficit hyperactivity disorder (ADHD), which was statistically significantly more prevalent in the PA group, most of the group differences between PAs and PRD males became nonsignificant. In another study, Kafka and Hennen (10) divided a group

[1]Institute for Sex Research and Forensic Psychiatry, Department of Psychiatry and Psychotherapy, University Hospital Hamburg, Martinistrasse 52, D-20246 Hamburg, Germany.
[2]Department of Psychiatry, McLean Hospital, 115 Mill St., Belmont, MA 02478 and Harvard Medical School, Boston, MA.

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of 220 consecutively evaluated men into three subgroups on the basis of the lifetime cumulative number of PAs and PRDs. In that study, the total number of these disorders was considered as a proxy measure of the severity of sexual impulsivity. In the "high group" with at least five lifetime PAs and PRDs they found predominantly sex offenders, with multiple paraphilias who self-reported the highest rates of enacted sexual behaviors, the most sexual preoccupation and the highest likelihood of incarceration for sex offences. In addition, men in the "high group" reported the highest incidence of physical abuse, childhood ADHD-combined subtype, school-associated behavioral problems, lower educational achievement, and the highest incidence of current unemployment.

There has been no study systematically investigating the role of nonparaphilic sexual addiction or the PRDs in sexual homicide perpetrators. It is interesting, however, that Prentky et al. (11) noted multiple paraphilias as prevalent in their study of 25 sexual murderers and reported compulsive masturbation (which they enlisted as a "paraphilic" diagnosis) had a sample prevalence of 80%. In addition, Langevin (12) reported that sexual murderers (39%) and sexual sadists (48%) had a higher prevalence of "pornography collection" compared with sexual offenders in general (11%). All of these aforementioned data, then, certainly suggest that PRDs merit closer attention in the assessment of sexually dangerous men.

We wanted to examine whether a combination PAs and PRDs is a useful sign of the severity of disturbance that we not only understand as exclusive categorical diagnoses but also as dimensional approach to explain the severity and recidivistic risk associated with sexual impulsivity disorders. According to the aforementioned literature, our hypotheses were that the group with PAs and PRDs would report the most cumulative sexual impulsivity disorders, the most severe developmental problems (including signs for ADHD), the highest amount of sexual preoccupation, the highest number of previous sexual offences, and the highest incidence of incarceration.

Methods

We evaluated psychiatric court reports on 166 men who had committed sexual homicide. More detailed information about the methods and data describing the influence of brain abnormalities on psychosocial development, criminal history and paraphilias in this series of sexual murders has previously been published (13). In five cases, we had missing data according to the PA/PRD diagnoses, so we had to exclude these records.

We adopted the *definition of sexual homicide* by Ressler et al. (14). The reports were requested mainly to assess criminal responsibility or for risk assessment before release or changes in security levels of imprisonment. They were based on external information (attorney, court, witnesses, relatives, former psychiatric, and psychological assessments), the psychiatric examination as well as somatic and psychological assessments. Additional information was evaluated if available (psychological tests, previous forensic reports, court verdicts, etc.).

PAs were diagnosed by the raters according to Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV) (15). PRDs were defined according to the criteria described by Kafka and Hennen (8) as mentioned above and included not only the repetitive nonparaphilic behavior but also volitional impairment, personal distress, or impairment in social, occupational, or other areas of personal functioning. Socio-demographic data, childhood development, sexual, psychiatric, and criminal history was assessed with an operationalized, computerized questionnaire.

Traumatization during childhood (until the age of 15 years) was assessed using the definitions by Engfer (16): Physical abuse implied beating or other violent actions (punching, shaking, burning, stabbing, etc.) that can lead to injuries of the child, but not just light slaps. Sexual abuse was defined as sexual activity of a child with an adult or a person at least 5 years older, to which the child or adolescent was forced or did not consent to.

In the *criminal history* we rated as previous offences not only those that were officially registered by the police or sentenced by the court, but all actions that could have resulted in an official sanction. The so-called "psychopathic," i.e. mainly antisocial personality traits were assessed using the Psychopathy Checklist Revised (PCL-R; (17)).

The raters were experienced forensic psychiatrists (A. H., P. B.) or psychologists (N. H.) and trained for this study using a manual. *Interrater reliability* was assessed evaluating 20 reports by all three raters (P. B., A. H., N. H.) and obtaining a consensus rating for each item. For paraphilias the mean κ coefficient was 0.82. For PRD diagnoses using Kafka and Hennen's (8) criteria, interrater reliability was $\kappa = 0.91$ for compulsive masturbation, $\kappa = 0.67$ for protracted promiscuity, $\kappa = 0.73$ for pornography dependence, and $\kappa = 0.78$ for severe sexual desire incompatibility. There were no cases of telephone-sex dependence and/or ego-dystonic persistent use of sexual accessories so we excluded these items. For the PCL-R good interrater reliability was obtained (single measure ICC = 0.84 for the PCL-R total score).

Grouping Variables and Statistical Analysis

The sample of 161 subjects was divided into four subgroups to their sexual impulsivity disorders: men who neither had a PA nor a PRD (abbreviation: NoPA/noPRD), men who were diagnosed at least with one PRD but no PA (abbreviation: PRD), men who were diagnosed with at least one PA but no PRD (abbreviation: PA), and those with a combination of both (abbreviation: PA+PRD).

Between-group comparisons were analyzed using the χ^2 test or Fischer's exact test of independence for categorical variables. Each subgroup was compared with the three other subgroups. Comparisons of continuous variables were assessed by unpaired, two-tailed Student's *t*-tests, and analysis of variance (ANOVA) was utilized for multiple comparisons. Significant differences in the means reported between multiple group comparisons was examined using the *post hoc* Fischer's LSD test. Statistical significance was set at $p < 0.05$. For statistical analysis SPSS 11.5 (SPSS Inc., Chicago, IL) was used.

Results

Sociodemographic Data

The sociodemographic, developmental, and psychiatric characteristics of the four groups are described in Table 1. All demographic variables derived from archival sources are based on the incidence of behaviors associated with the first homicidal offence. Thirty-six percent ($N = 58$) of the sample had only PAs ($N = 29$) or only PRDs ($N = 29$), the combination of PA and PRD was found in 34.8% of the sample ($N = 56$), and 47 men (29.2%) showed neither a PA nor a PRD. We found no statistically relevant group differences according to the age at the first homicide, educational level, marriage, or partnership at the time of the first homicide.

TABLE 1—*Demographic, developmental, and psychiatric characteristics in a sample of 161 sexual murderers.*

Variable	NoPRD/noPA		PRD		PA		PA+PRD	
	N	%	*N*	%	*N*	%	*N*	%
Subgroup	47	29.2	29	18.0	29	18.0	56	34.8
School education								
Without formal degree, reform school	19	40.4	17	58.6	16	55.2	24	42.9
Basic school (9 years)	24	51.1	10	34.5	12	41.4	26	46.4
High school (10 years)	3	6.4	2	6.9	0	0	3	5.4
Qualification for university (13 years)	1	2.1	0	0	1	3.0	3	5.4
Partnership								
Partnership at the time of the homicide	13	27.7	8	27.6	5	17.2	17	30.4
Never married	33	72.0	15	51.7	21	72.4	47	83.9
Employment history								
Unemployed*	16	34.0	13	44.8	4	13.8	15	26.8
Childhood behavior problems								
Isolation*†	30	63.8	15	51.7	23	79.3	43	76.8
Enuresis/encopresis‡†	6	12.8	4	13.8	11	37.9	**22**	39.3
School problems	32	68.1	22	75.9	21	72.4	41	73.2
Indications for ADHD‡†§	5	10.6	3	10.3	2	6.9	**17**	30.4
Abuse history								
Sexual abuse‡	5	10.6	9	31	8	27.6	13	23.2
Physical maltreatment	29	61.7	22	75.9	20	69.0	43	76.8
Alcohol dependence*	12	25.5	9	31.0	1	3.4	10	17.9
Age at first sexual homicide; mean (SD)	25.0	(7.3)	29.5	(10.3)	27.2	(8.7)	26.4	(7.1)

*PRD vs. PA group differences statistically significant ($p < 0.05$).
†PRD vs. PRD+PA group differences statistically significant ($p < 0.05$).
‡NoPRD/noPA vs. PA+PRD group differences statistically significant ($p < 0.05$).
§PA vs. PRD+PA group differences statistically significant ($p < 0.05$).
PA, paraphilic disorder; PRD, paraphilic-related disorders; ADHD, attention-deficit hyperactivity disorder.

NoPA/noPRD Group (N = 47)

This group seemed relatively less developmentally disturbed compared with the other three groups (Table 1). Individuals of this group had the lowest rate of previous sexual offences; the shortest time spent in previous incarcerations, and were less psychopathic according to their PCL-R scores (Table 4). Seventy percent of the perpetrators had consumed alcohol at the time of the homicidal offence and most of the victims were not strangers. Only the PRD group reported a higher incidence of alcohol abuse during the commission of their index crime.

PRD Group (N = 29)

Significantly more men of the PRD group were unemployed while the PA group showed the highest rate of current employment (Table 1*:* PRD > PA, Fischer's exact: $p = 0.02$). Regarding childhood trauma, there was a higher prevalence for sexual abuse in the PRD group compared with the NoPA/noPRD group but not with any other paraphilic group (Table 1; Fischer's exact: $p = 0.028$). There were no differences according to physical abuse histories between the four groups.

In the PRD group alcohol dependence was diagnosed more often than in the PA group (Table 1; Fischer's exact: $p = 0.006$). Promiscuity was more likely to be found in the PRD group than in the PA+PRD group (Table 2; Fischer's exact: $p = 0.000$). In the PRD group nearly 38% were "psychopaths" according to European standards (18) (Table 4; PCL-R total score >25) and had also the highest PCL-R total score (Fischer's LSD *post hoc* test: $p < 0.05$) followed by the PA+PRD group. Consumption of alcohol at the time of the homicide was also found most often in the PRD group (85.7%) followed by the group without PAs or PRDs (Table 4; $\chi^2 = 12.3$, df = 3, $p = 0.007$).

PA Group (N = 29)

Pedophilia was more common in the PA group but this difference was not statistically significant in comparison with the combined PA/PRD group. However, compared with the NoPA/noPRD group the PA group showed a relatively higher rate of previous child molestations (Table 4; Fischer's exact: $p = 0.000$) and hands-off sexual delinquency (Fischer's exact: $p = 0.028$). The prevalence of a history of sexual abuse, however, was not statistically significantly different among males who met criteria for either PAs or PRDs or PA+PRDs.

PA+PRD Group (N = 56)

Individuals of the PA+PRD group were significantly more often isolated in childhood than men of the PRD group (Table 1; Fischer's exact: $p = 0.027$). They suffered more from enuresis and encopresis in childhood than both nonparaphilic groups (Table 1; PA+PRD > NoPA/noPRD, Fischer's exact: $p = 0.004$; PA+PRD > PRD, Fischer's exact: $p = 0.024$). Indications for ADHD (motor hyperactivity, concentration problems) were more prominent in the PA+PRD group than in the paraphilic group (Table 1; Fischer's exact: $p = 0.025$) although school-associated problems, a typical concomitant to ADHD, were equally prevalent among all four groups of men.

When comparing the groups according to the cumulative lifetime number of sexual impulsivity disorders (PAs and PRDs), we found higher rates of sexual sadism in the PA+PRD group than in the PA group (Table 2; Fischer's exact: $p = 0.002$). There were no other specific paraphilic diagnoses that were significantly more frequent in the PA+PRD group. We also found a significantly higher prevalence of compulsive masturbation (Table 2; Fischer's exact: $p = 0.000$) and pornography dependence (Fischer's exact:

TABLE 2—*Paraphilias and paraphilia-related disorders in a group of 161 sexual murderers.*

Variable	NoPRD/noPA		PRD		PA		PA+PRD	
	N	%	*N*	%	*N*	%	*N*	%
Subgroup	47	29.2	29	18.0	29	18.0	56	34.8
DSM-IV paraphilias								
Sexual sadism*	0	0	0	0	14	48.3	46	82.1
Masochism	0	0	0	0	3	10.3	6	10.7
Pedophilia	0	0	0	0	10	34.5	11	19.6
Transvestic fetishism	0	0	0	0	4	13.8	6	10.7
Fetishism	0	0	0	0	3	10.3	2	3.6
Exhibitionism	0	0	0	0	1	3.4	5	8.9
Voyeurism	0	0	0	0	2	6.9	8	14.3
Paraphilia NOS	0	0	0	0	3	10.3	10	17.9
Paraphilia-related disorders (PRDs)								
Compulsive masturbation†	0	0	6	20.7	0	0	42	75.0
Promiscuity†	0	0	26	89.7	0	0	27	48.2
Pornography/telephone sex dependence†	0	0	0	0	0	0	11	19.6
Severe desire incompatibility	0	0	4	13.8	0	0	12	21.4
Mean number of sexual impulsivity disorders (SD)†*	0	0	1.3	0.5	1.4	0.6	3.2	1.2

*PA vs. PRD+PA group differences statistically significant ($p<0.05$).
†PRD vs. PRD+PA group differences statistically significant ($p<0.05$).
‡NoPRD/noPA vs. PRD group differences statistically significant ($p<0.05$).
PA, paraphilic disorder; PRD, paraphilic-related disorder; DSM-IV, Diagnostic and Statistical Manual of Mental Disorders-IV.

$p = 0.013$). The mean number of sexual impulsivity disorders was statistically significantly higher in the PA+PRD group (mean number of SIDs: 3.2 ± 1.2) in comparison with the two other groups (Fischer's LSD *post hoc* test: $p<0.05$). There was only a trend toward a higher number of PA diagnoses in the PA+PRD group vs. the PA group (mean number of PAs: 1.7 ± 0.8 vs. 1.4 ± 0.6; $t = 1.7$, df = 83, $p = 0.093$) but a significantly higher number of PRDs in the PA+PRD group compared with the exclusive PRD group (mean number of PRDs: 1.6 ± 0.7 vs. 1.3 ± 0.5; $t = 2.7$, df = 78, $p = 0.009$). The PA+PRD group reported the highest frequency of compulsive masturbation starting in adolescence (Table 3; PA+PRD>PA, $\chi^2 = 10.0$, df = 2, $p = 0.007$) and during the last year before the sexual homicide, followed by the PRD group (PA+PRD>PA, $\chi^2 = 21.7$, df = 2, $p = 0.000$; PA+PRD>PRD, $\chi^2 = 9.9$, df = 2, $p = 0.007$). Masturbation with sadistic (Table 3; Fischer's exact: $p = 0.000$) and homicidal fantasies (Table 3; Fischer's exact: $p = 0.004$) was more prevalent in the PA+PRD group than in the PA group. Regarding criminal history the PA+PRD group had committed significantly more sexual offences compared with the group without PAs or PRDs (Table 4; Fischer's exact: $p = 0.000$), esp. rape/sexual assault (Fischer's exact: $p = 0.004$) and attempted sexual homicide (Fischer's exact: $p = 0.02$) and showed the longest duration of previous incarcerations (Fischer's LSD *post hoc* test: $p<0.05$). In the PA+PRD group most of the victims were strangers (Table 4; $\chi^2 = 11.7$, df = 3, $p = 0.009$). Almost 34% of the men had committed a sexual homicide more than once (Table 4; PA+PRD>PRD, Fischer's exact: $p = 0.005$).

Discussion

Sexual sadism was the most prominent diagnoses in this as well as in other studies on sexual homicide perpetrators, although only two other studies (19,20) used standardized diagnostic criteria. Firestone et al. (19,20) and Langevin (12) found even higher rates

TABLE 3—*Masturbation in adolescence and in the year before the homicide.*

Variable	NoPRD/noPA		PRD		PA		PA+PRD	
	N	%	*N*	%	*N*	%	*N*	%
Subgroup	47	29.2	29	18	29	18	56	34.8
Masturbation in adolescence*†	44		23		22		53	
<Once per month	13	29.5	3	13.0	1	4.5	5	9.4
≤Once per day	29	65.9	17	58.6	19	65.5	25	47.2
>Once per day	2	4.5	3	13.0	2	9.1	23	43.4
Masturbation in the year before the homicide*‡†	42		19		24		51	
<Once per month	18	42.9	4	21.1	4	16.7	5	9.8
<Once per day	17	40.5	9	47.4	16	66.7	9	17.6
≥Once per day	7	16.7	6	31.6	4	16.7	37	72.5
Masturbation with sadistic fantasies§*¶†	2/47	4.3	1/24	4.2	8/26	30.8	39/48	81.3
Masturbation with killing fantasies*‡†	1/46	2.2	0/24	0	3/26	11.5	20/46	43.5

*NoPRD/noPA vs. PA+PRD group differences statistically significant ($p<0.05$).
†PA vs. PRD+PA group differences statistically significant ($p<0.05$).
‡PRD vs. PRD+PA group differences statistically significant ($p<0.05$).
§NoPRD/noPA vs. PA group differences statistically significant ($p<0.05$).
¶PRD vs. PA group differences statistically significant ($p<0.05$).
PA, paraphilic disorder; PRD, paraphilic-related disorder.

TABLE 4—*Criminal history and offence characteristics of 161 sexual murderers.*

Variable	NoPRD/noPA		PRD		PA		PA+PRD	
	N	%	*N*	%	*N*	%	*N*	%
Subgroup	47	29.2	29	18.0	29	18.0	56	34.8
Previous sexual offences								
Any sexual offence*†‡	11	23.4	16	55.2	19	65.5	42	75.0
Sexual assault/rape‡	10	21.3	11	37.9	10	34.5	27	48.2
Child molestations*†‡	3	6.4	8	27.6	12	41.4	19	33.9
Attempted sexual homicide‡	1	2.1	1	3.4	2	6.9	9	16.1
Months incarcerated before homicide; mean (SD)‡§	8.8	(29.6)	18.1	(24.7)	23.5	(48.8)	36.8	(47.1)
PCL > 25*‡§	3	6.4	11	37.9	3	10.3	13	23.2
Mean PCL-R sum score (SD)*‡¶‖	12.9	(7.3)	20.7	(8.8)	14.0	(6.8)	18.8	(8.2)
Consumption of alcohol within homicide*¶§	33	70.2	24/28	85.7	13/28	46.4	30/55	54.5
Strange victim‡§¶	14	29.8	10	34.5	11	37.9	34	60.7
Serial murder (more than one victim)‡§	7	14.9	2	6.9	7	24.1	19	33.9

*NoPRD/noPA vs. PRD group differences statistically significant ($p < 0.05$).
†NoPRD/noPA vs. PA group differences statistically significant ($p < 0.05$).
‡NoPRD/noPA vs. PA+PRD group differences statistically significant ($p < 0.05$).
§PRD vs. PRD+PA group differences statistically significant ($p < 0.05$).
¶PRD vs. PA group differences statistically significant ($p < 0.05$).
‖PA vs. PRD+PA group differences statistically significant ($p < 0.05$).
PA, paraphilic disorder; PRD, paraphilic-related disorder.

for sexual sadism (70–75%) than in our sample. In Langevin's study (12) voyeurism and fetishism were also reported more frequently in sexual homicide perpetrators compared with (nonhomicidal) sexual offenders while the use of pornography was most likely associated with (nonhomicidal) sadism. Prevalence rates for pedophilia in previous studies on sexual homicide perpetrators were often not reported (40% in a sample of sexual murderer with a high proportion of child victims (19); 10% in serial sexual murderers (21)). Another important factor that has to be addressed in sexual murderers is the strong relationship between sadistic and "psychopathic" traits (22). Our results are consistent with Porter et al. (23) who showed that nearly 85% of the sexual homicide perpetrators investigated in their study scored in the moderate to high range on the PCL-R (17). The high rates of alcohol dependence and intoxication at the time of the homicide found in our study are also consistent with results from other studies where prevalence rates for alcohol abuse/dependence ranged between 24% (20) and 58% (12).

In this large sample of men who have committed sexually motivated homicides, our primary hypotheses regarding the combination of PAs and PRDs were substantially confirmed. The "combined group" had the greatest number of cumulative lifetime sexual impulsivity disorders. It is intriguing that this statistically significant difference in cumulative sexual diagnoses was not primarily a difference in the number of PA diagnoses between the groups, but it was only when the PRD diagnoses were considered and combined with the PA diagnoses that this difference became statistically apparent in the PA+PRD group in comparison with the PA group. In addition, the combined group was reported to have more developmental psychopathology (enuresis, encopresis, and possibly ADHD, as well as social isolation) in comparison with the other groups. The result of a higher rate of ADHD symptoms is consistent with Kafka and Hennen's (8) study. Stevenson and Goodman (24) found that a history of daytime enuresis at an early age increases the risk of later criminal convictions. In addition to having the greatest number of and diversity among the sexual impulsivity diagnoses, the combined group also had an earlier onset of sexual symptomatology (adolescent onset compulsivity masturbation), the highest reported incidence of both sadistic and homicidal sexualized fantasies, and the highest incidence of remaining single as an adult. Previous studies on sexual murderers found high levels of chronic isolation or loneliness, more pronounced in serial than in single murderers (25), and more often in murderers than in rapists (26). Membership in the PA+PRD group was also associated with additional indicators of both severity and adverse outcome such as committing serial murders, murdering stranger victims, committing previous sexual offences and having spent the most time incarcerated. Many of these variables are associated with sexual offender recidivism in meta-analytic studies (27,28). The statistically significant association between multiple sexual impulsivity disorders and more developmental adversity and psychopathology as well as recidivistic sexual behavior was also consistent with Kafka and Hennen's (10) report.

In consideration of the final common pathway of all the males in this study, sexually motivated homicide, the only measures that the PA+PRD combined group was not more impaired were related to the sexual abuse history, the PCL-R scores, alcohol dependence and consumption of alcohol during the index offense. These measures were highest in the PRD-only group. The result of a high incidence of sexual abuse (31%) is consistent with results regarding nonparaphilic sexual addictions in nonhomicidal sexual offenders (1,29). Protracted promiscuity was most commonly diagnosed in the exclusive PRD group. This could indicate less avoidance of partnered sexuality and more relationship problems in these offenders than in the paraphilic subgroups. The predominance of promiscuity in this subgroup might be explained by an overlap with "psychopathy" since promiscuity is one of the items in the PCL-R (17).

There are several limitations to the conclusions associated with this study's methodology. The primary limitation is that this was a retrospective study based on forensic reports. Despite the length and detail afforded in these reports, they were not written uniformly and the interrater reliability of the reporters could not be ascertained. Because of this limitation, it is possible that differences in methods of inquiry to assess quantitatively specific paraphilic and, especially PRDs, may not have been uniformly determined.

Recent research has suggested other prominent factors that elevate the risk for sexual homicide including psychopathy (22,23)

and neuropsychiatric abnormalities (13,30–33). Silva et al. (30–33) proposed a neurodevelopmental model with autism spectrum psychopathology especially for a subset of serial murderers. This model includes psychopathy, aggression, sexual psychopathology, and environmental factors with an emphasis on stress as major causative components. We did not systematically assess autism spectrum disorders in this sample but the higher prevalence of enuresis, encopresis, and ADHD symptoms in the PA+PRD group suggest that they may include subjects with more severe neurodevelopmental impairments.

Our study, for the first time, adds the concept of the PRDs to the research on sexual homicide perpetrators. Although the co-occurrence of different PAs with sexual homicide was reported in several studies (for a review see (34)), the relationship between PAs and PRDs in sexual murderers has never been investigated systematically. The predominance of sexual sadism and compulsive masturbation in the combined group (PA+PRD) could support the hypothesis of obsessive–compulsive traits especially among a subgroup of sexually sadistic serial murderers (34) and should be investigated further. Strength of this study is that we did not focus only on the more striking cases of paraphilic or serial sexual homicide perpetrators. It seems that in the nonparaphilic cases psychopathy, relational problems, and substance-related disorders like intoxications play a major role.

This study would have been enhanced were we able to identify a control group of nonsexual homicide perpetrators or nonhomicidal sexual offenders. Despite the significant limitations, however, it must be emphasized that this is the largest sample of sexual murders that we are aware of having been reported in the literature and that the salient findings reported in this study are consistent with the general research literature on predictor variables associated with adverse outcome and increased recidivism in hands-on sexual offenders (28).

Our data suggest that PRDs should be systematically assessed in sexual offenders and that their inclusion in our evaluation procedures may help to more readily identify those offenders with the most lifetime sexual impulsivity disorders, a group whose sexual impulsivity is more likely to be associated with a progressive and recidivistic course.

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Additional information and reprint requests:
Peer Briken, M.D.
Institute for Sex Research and Forensic Psychiatry
University Hospital Hamburg-Eppendorf
Martinistrasse 52
D-20246 Hamburg
Germany
E-mail: briken@uke.uni-hamburg.de