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High Rates of Sexual Behavior in the General Population: Correlates and Predictors

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We studied 2450, 18–60-year-old men and women from a 1996 national survey of sexuality and health in Sweden to identify risk factors and correlates of elevated rates of sexual behavior (hypersexuality) in a representative, non-clinical population. Interviews and questionnaires measured various sexual behaviors, developmental risk factors, behavioral problems, and health indicators. The results suggested that correlates of high rates of intercourse were mostly positive, whereas the correlates of high rates of masturbation and impersonal sex were typically undesirable. For both men and women, high rates of impersonal sex were related to separation from parents during childhood, relationship instability, sexually transmitted disease, tobacco smoking, substance abuse, and dissatisfaction with life in general. The association between hypersexuality and paraphilic sexual interests (exhibitionism, voyeurism, masochism/sadism) was particularly and equally strong for both genders (odds ratios of 4.6–25.6). The results held, with a few exceptions, when controlling for age, being in a stable relationship, living in a major city, and same-sex sexual orientation. We conclude that elevated rates of impersonal sex are associated with a range of negative health indicators in the general population.

KEY WORDS: sexual behavior; population survey; paraphilias.

INTRODUCTION

One of the most salient dimensions of sexual behavior is frequency. Historically, excessive sexual behavior was considered important (e.g., Hagenbach, 2002), whereas recent research and medical attention has focused on disorders that inhibit or block sexual expression, such as hypoactive sexual desire disorder, male erectile disorder, and dyspareunia (American Psychiatric Association, 2000). The *DSM-IV-TR* does not address problems associated with excessive sexuality, and such problems were only briefly mentioned as "non-paraphilic sexual addictions" in the *DSM-III-R* (American Psychiatric Association, 1987), as an example under sexual disorders not otherwise specified.

The attention to inhibitory sexual problems has been justified by large scale community surveys in which such sexual difficulties are associated with dissatisfaction with sexual life (Fugl-Meyer & Sjögren Fugl-Meyer, 1999), decreased quality of life (Ventegodt, 1998), and low general happiness (Laumann, Paik, & Rosen, 1999). Laumann, Gagnon, Michael, and Michaels (1994), for example, found that individuals who have intercourse less than three times per month were less happy than average.

Although sexual experience is highly valued in Western cultures, there is some evidence that high rates of sexual behavior can be problematic. It is easy to find individuals whose high frequency sexual behavior appears to interfere with their personal happiness and social adjustment; in fact, an entire journal, *Sexual Addiction and Compulsivity*, is devoted to this topic. It has even been suggested that compulsive sexuality may be common, possibly affecting up to 6% of the general population in the United States (Black, 2000; Coleman, 1992). The

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question motivating the current research is whether it makes sense to consider an upper limit on the amount of sexual behavior, beyond which the behavior could reasonably be described as excessive. In other words, is it possible to determine how much sex is "too much"?

Correlates of High Frequency Sexual Behavior

In medical practice, high rates of sexual behavior have occasionally been noted secondary to brain injury, particularly insults to the right temporal cortex (Braun, Dumont, Duval, Hamel, & Godbout, 2003), including stroke (Stein, Hugo, Oosthuizen, Hawkridge, & van Heerden, 2000) and multiple sclerosis (Gondim Fde & Thomas, 2001; Huws, Shubsachs, & Taylor, 1991). More often though, it is encountered as a symptom in general impulse control disorders, mania (Perugi et al., 1998), substance use, and personality disorders. Clinical studies of adults (predominantly men) recruited for research on, or seeking help for, compulsive or excessive sexuality suggest substantial (>30%) co-morbidity with anxiety and mood disorders and substance abuse (Bancroft & Vukadinovic, 2004; Black, Kehrberg, Flumerfeldt, & Schlosser, 1997; Kafka & Hennen, 2002; Kafka & Prentky, 1994; Raymond, Coleman, & Miner, 2003), pathological gambling (Black et al., 1997), attention deficit hyperactivity disorder (Kafka & Hennen, 2002; Kafka & Prentky, 1998), and personality disorder (Black et al., 1997; Raymond et al., 2003).

The public health hazard associated with excessive or risky sexual behavior that has attracted the most attention has been the increased risk for acquiring STD, in particular HIV infection (Johnson et al., 2001). A less well-known but troubling feature associated with high rates of sexual behavior is paraphilia—deviant sexual interests involving pain or suffering or that preclude a consenting adult partner (Black et al., 1997; Kafka & Hennen, 1999, 2002). Sexual preoccupations are common among identified sexual offenders (Marshall & Marshall, 2001) and, when present, increase their risk of sexual recidivism (Quinsey, Khanna, & Malcolm, 1998). The association between paraphilias and high rates of sexual behavior is sufficiently strong to prompt Kafka (1997) to propose that excessive sexual desire be classified as a paraphilia-related disorder.

High Rates of Sexual Behavior as a Distinct Disorder (Hypersexuality)

Although clinical studies have found an association between high rates of sexual behavior and a variety of mental and physical problems, there is less agreement on whether excessive sexual behavior should be a distinct disorder. Among those who propose a distinct disorder, the nosology remains controversial (Goodman, 2001). The term "compulsive sexual behavior" is often used to describe high rates of masturbation, pornography use, and protracted promiscuity, but there is little evidence for a connection to obsessive-compulsive disorder (Jaisoorya, Janardhan Reddy, & Srinath, 2003). Some researchers (e.g., Coleman, 1992; Raymond et al., 2003) have used broader definitions of sexual preoccupation, including not only impersonal sex acts, but also preoccupation with unobtainable partners and multiple love relationships. The latter factors, however, would better be understood as relationship problems, which fall outside a core definition of excessive sexual behavior.

Kafka (1997) proposed a definition of hypersexuality based on the total frequency of sexual outlets. Using data from Kinsey, Pomeroy, and Martin (1948) and others (Atwood & Gagnon, 1987), Kafka recommended that the minimum criteria for hypersexual disorder would be daily orgasms for six consecutive months, which would identify the top 5–10% of the male population. Kafka's definition included all sexual outlets: intercourse with a regular partner, along with masturbation, protracted promiscuity, and paying for sex. Daily orgasm was necessary but not sufficient for Kafka's definition of hypersexuality; to be problematic, the high frequency of total sexual outlets also required significant sexual pre-occupation and adverse psychosocial consequences (Kafka, 1997, 2003).

Kafka's (1997, 2003) definition is promising, but it is always difficult to define unusual behavior (in the statistical sense) as pathological. Even if the behavior is rare, and the people engaging in the behavior show distress or impairment, the behavior could still be simply "different." The experience of distress or impairment is not solely a function of the individual's characteristics; it will also be related to others' reactions to these characteristics (consider, for example, homosexuality in a homophobic culture). Nevertheless, the observation that a particular behavior is rare and that it is associated with negative or positive attributes and outcomes is an important reference point in judging whether that behavior is a potential asset or a liability.

Total sexual outlet is a face valid and easily quantified index of the rate of sexual activity, but there are problems with using it as a marker for excess. In a large survey of sexual behavior in the United States, Laumann et al. (1994) found that the frequency of intercourse was positively associated with happiness whereas an elevated masturbation frequency was related to decreased happiness. Furthermore, individuals who had only one sex

partner during the past 12 months were happier than those who had multiple sex partners (or those who had none). Consequently, a definition of excessive sexuality that only counts orgasms is likely to miss important distinctions in the expression of sexuality.

One hypothesis is that definitions of excessive sexuality should be based on high rates of impersonal sex, and not on high rates of intercourse within romantic relationships. "Impersonal sex" could be defined as sexual behavior that is primarily concerned with and focused upon the sex act itself. In contrast, "personal sex" is sexual behavior that is concerned with and focused upon a particular person. The psychological attitude determines whether sex is personal or impersonal. It is possible, for example, to treat a long-term stable sex partner as a sex object. Similarly, it is possible to have a deep, human connection with the partner involved in a one-night stand. There are, however, some sexual behaviors that are more likely motivated by the sex acts themselves rather than by attraction to a particular person. Examples of impersonal sex would include masturbation (no partner), paying for sex, and multiple changes in partners.

Overview of Current Study

The objective of the current study was to explore the correlates and risk factors of high rates of sexual behavior in a large, representative epidemiological sample. Most of what we know about hypersexuality comes from clinical studies or from individuals who self-identify problems with excessive sexuality. Although recently there have been a number of large, population-based studies of high frequency sexual behavior, these surveys excluded masturbation because their focus has been on the risk of sexually transmitted diseases (e.g., Johnson, Wadsworth, Wellings & Field, 1994; Ramrakha, Caspi, Dickson, Moffitt, & Paul, 2000). Among the few recent surveys that included questions concerning masturbation (e.g., Laumann et al., 1994), none, to our knowledge, has considered the physical and mental health correlates of high frequency sexual behavior (including masturbation). The neglect of masturbation is significant because masturbation is the primary sexual outlet of hypersexual males (Kinsey et al., 1948).

The Swedish Sexuality and Health Project provided a unique opportunity to study hypersexuality because it yielded information on a wide range of sexual behaviors (intimate, impersonal, and solitary) in the general population along with measures of physical and psychological health, subjective well-being, and paraphilic interests. Using the available data, personal sex was measured by intercourse within stable relationships and impersonal sex was indexed by a variety of indicators (e.g., masturbation, paying for sex, group sex, frequent changes in sex partners). We hypothesized that personal sex would be associated with positive factors (e.g., satisfaction with sexual life and life in general), but that high rates of impersonal sex would be associated with undesirable features (e.g., paraphilia, substance abuse, dissatisfaction with life in general).

METHOD

Participants

We analyzed data collected for the Sexuality and Health Project (Lewin, Fugl-Meyer, Helmius, Lalos, & Månsson, 1998), sponsored by the Swedish Public Health Institute and approved by the research ethics committee of the Swedish Research Council for Humanistic and Social Sciences. The Sexuality and Health Project contacted by mail a random selection of 5250 18–74-year-olds from the general population of Sweden in 1995 (6,200,000 individuals). Of these, 469 were considered ineligible due to language problems, severe visual or hearing impairment, long-term illness, or emigration. The remaining 4781 subjects were invited to participate, and 2810 consented when the study was conducted during the spring of 1996 (59% response rate). A comparison of responders and non-responders did not find gender differences or differences on social or geographic characteristics; however, older persons (particularly older women) were less likely to participate (Lewin et al., 1998). Consequently, all respondents over age 60 were eliminated to minimize the effects of age-related attrition. The final sample included 1279 men and 1171 women aged 18–60.

Procedure

Before data collection, participants signed informed consent forms. Trained research assistants collected information concerning sociodemographic variables, work, and leisure activities during face-to-face interviews, typically in the respondent's home. Information about sexuality and sexual health was obtained from questionnaires completed in private. The efforts to obtain confidentiality appeared successful because previous analyses revealed no general social desirability bias or obvious deception, not even for the sensitive sex-related questions (Lewin et al., 1998).

Table I. Indicators of Hypersexuality Among 18–60-Year-Old Subjects in a Representative National Sample

	Men ($n = 1244$)				Women ($n = 1142$)			
Variable	*M*	*SD*	Indicator of hypersexuality		*M*	*SD*	Indicator of hypersexuality	
Masturbation during last month (times)	4.9	6.9	≥15	(11.4%)	1.6	3.3	≥5	(10.6%)
Pornography use last year (times)	14.0	36.8	≥31	(9.8%)	1.4	4.5	≥4	(10.5%)
Number of sexual partners								
Last year	1.4	1.6	≥3	(10.0%)	1.2	1.8	≥2	(12.3%)
Per active year	0.9	1.4	≥3	(6.4%)	0.6	1.2	≥2	(5.5%)
Ever sex with another person while married/cohabiting			Yes	(38.2%)			Yes	(24.4%)
Currently more than one stable sex partner[a]			Yes	(2.2%)			—	—
Prefers casual sex lifestyle to one (or no) stable partner			Yes	(20.1%)			Yes	(6.8%)
Ever group sex			Yes	(10.4%)			Yes	(4.4%)

[a] An insufficient number of women ($n = 5$) responded affirmatively to provide a reliable estimate.

Measures

Indicators of High Rates of Impersonal Sex

Table I presents the indicators of impersonal sexual behavior used in the current study: masturbation, pornography use, number of sex partners in last year, number of sex partners per active year, ever sex with another person while married/cohabiting, currently more than one stable sex partner, attitudes supportive of casual sex, and group sex. For continuous measures, a high level of impersonal sex was determined by selecting an integer cut-point near the 90th percentile separately for men and women (identifying the top 5–10% of male and female samples, respectively). For example, a high rate of masturbation for men was defined as 15 times or more during the last month, which identified 11.4% of the men. For women, a rate of masturbation of five times or more during the last month identified the top 10.6% of the women. The same items (with different cut-points) were used for both genders with the exception that, for women, the item "currently more than one stable sex partner" was not used because only five women endorsed this item. Dichotomous variables were based on the presence or absence of each characteristic (cf. Table I)

The indicators of impersonal sex were positively correlated with each other and crude overall comparisons showed similar relationships to studied risk factors and correlates (data not shown). For men, principal components factor analysis indicated that the eight items in Table I could be subsumed under one factor, accounting for 26.3% of the variance. A one-factor solution seemed most appropriate judging from Cattell's (1966) scree test and visual inspection of two- and three-factor solutions. The average correlations among the items were small to moderate (Cronbach's $\alpha = .58$).

For women, factor analysis indicated that the seven items in Table I could be subsumed under one factor, accounting for 25.6% of the variance. Again, a one-factor solution seemed most appropriate judging from Cattell's scree test and visual inspection of two- and three-factor solutions. The average correlations between the items were small to moderate (Cronbach's $\alpha = .51$).

If the items listed in Table I are valid indicators of hypersexuality, then individuals with more of them should be more representative of persons with hypersexuality than those with few or none of the items. Consequently, the eight items in Table I were given unit weights and summed. The resulting scores were used to classify the men into three groups: low (0, $n = 554$), moderate (1, 2, $n = 539$), or high hypersexuality (≥3 indicators, $n = 151$). The seven items in Table I were similarly summed and used to classify women into low (0, $n = 635$), moderate (1, 2, $n = 427$), or high hypersexuality groups (≥3 indicators, $n = 80$). The cutoff for "high" hypersexuality was set at three or more indicators to identify as closely as possible the 90th percentile separately for each gender. Subjects with one or two indicators were assigned to an in-between "moderate" group. Thirty-five men and 29 women were not classified because they did not respond to two or more of the items.

Risk Factors and Correlates

The risk factors and correlates examined in this study are displayed in Tables II, III, and IV (32 variables

Table II. Selected Correlates to Frequency of Sexual Intercourse Among 18–60 Year-Old Subjects That Were in Stable Relationships with One Partner

Variable	Frequency of intercourse (last 30 days)	
	Men ($n = 826$)	Women ($n = 823$)
Satisfaction[a]		
... With sexual life[a]	.415***	.417***
... With life in general[a]	.084*	.090*
... With physical health[a]	.080*	.033
... With psychological health[a]	.048	.069*
Separation from parents during childhood	−.039	.062
Age 1st vaginal intercourse	−.118**	−.082*
n	801	806
Ever STD infection	−.003	.005
n	807	810
Ever sexually aroused by		
... Exposing genitals to a stranger	.105**	.050
... Spying on what others are doing sexually	.063	−.017
... Deliberately using pain	.107**	.071*
Ever illegal drug use[b]	.085*	.087*
Ever substantially drunk last month	.198***	.143***
Current tobacco smoker[c]	.018	.014

Note. Sample size is given for variables with missing data for more than 10 cases.
[a]Self-reported on a six-point Likert-type scale from very unsatisfying (1) to very satisfying (6).
[b]Use of narcotics not prescribed to subject by physician.
[c]Smoked five or more cigarettes per day during last year.
*$p < .05$. **$p < .01$. ***$p < .001$, two-tailed.

for each of the latter two). Most of the items are self-explanatory, with the exception of the following items (all translated from Swedish by the first author). Sexual abuse history was assessed with the question, "Were you ever involved in a sexual activity without wanting it yourself?" A separate variable was created if any abuse happened before age 18. The measure of sexual intercourse included both vaginal and anal intercourse. The subjects were not specifically asked if they self-identified as hetero-, bi- or homosexual. However, they did report whether they had been sexually attracted to women, men or both on a five-step Likert-type scale ranging from *exclusively women* to *exclusively men*. An individual was considered to have a homosexual attraction when he/she felt sexually attracted to individuals of the same sex as much as (or more) than with the opposite sex. STD infection history was based on the question, "Have you ever been afflicted with gonorrhea, chlamydia, syphilis, genital herpes, condyloma (genital warts), HIV/AIDS or any other sexually transmitted disease?" The English descriptions of all variables correspond closely to the intent of the original Swedish questions. For example, "Separation from parents during childhood" was based on the question "Did you grow up with both your parents?"

Self-reported sexual arousal was used to create proxy measures of DSM-IV paraphilias: "Have you ever exposed your genitals to a stranger and become sexually aroused by this?" (exhibitionism), "Have you ever spied on what other people are doing sexually and become sexually aroused by this?" (voyeurism), and "Have you ever deliberately used physical pain and become sexually aroused by this?" (masochism or sadism).

Self-reported satisfaction with sexual life, life in general, physical health, and psychological health was rated on a six-point Likert scale from very unsatisfying (1) to very satisfying (6).

Statistical Analysis

Differences among hypersexuality groups were tested with one-way ANOVAs for continuous variables and the χ^2-test for dichotomous variables. Given large samples sizes, even small effects would be statistically significant. Consequently, unadjusted odds ratios (OR)

Table III. Correlates of Hypersexuality Among 18–60-Year-Old Men in a Representative National Sample ($N = 1244$)

Variable	Level of hypersexuality			F or χ^2 (overall)	Unadjusted OR[a] (95% CI) (high vs. low)	Adjusted OR[b] (95% CI) (high vs. low)
	Low (0) ($n = 554$, 44.5%)	Moderate (1, 2) ($n = 539$, 43.3%)	High (3+) ($n = 151$, 12.1%)			
Sociodemographic characteristics						
Age (years)	38.21 (11.81)	36.31 (12.26)	34.03 (10.93)	8.41***	.97 (.95–.98)	—
Born and raised abroad (%)	6.0	7.8	9.9	3.20	1.74 (.92–3.29)	
Separation from parents during childhood (%)	12.1	15.2	25.2	15.90***	2.44 (1.56–3.82)	2.33 (1.45–3.74)
Currently living in major city area[c] (%)	17.6	28.5	37.7	32.90***	2.84 (1.91–4.21)	—
Current socioeconomic position[d]	1.65 (.70)	1.75 (.73)	1.69 (.72)	2.64	1.08 (.83–1.41)	
n	519	490	137			
Currently not studying or working (%)	8.5	6.5	12.1	5.09	1.48 (.83–2.64)	
n	543	523	149			
Sexuality and relationships						
Positive parental attitudes to sex[e]	3.30 (.72)	3.31 (.74)	3.44 (.86)	1.79	1.26 (.98–1.63)	
n	469	466	132			
Age 1st vaginal intercourse (years)	17.80 (3.69)	16.54 (2.45)	15.79 (2.23)	35.28***	.77 (.71–.84)	.76 (.70–.84)
n	516	507	148			
Frequency of intercourse last month	5.28 (5.19)	5.26 (6.65)	7.38 (7.60)	7.27**	1.06 (1.03–1.09)	1.08 (1.05–1.12)
n	492	491	143			
Ever victim of sexual abuse (%)	9.4	14.7	13.2	7.25*	1.47 (.85–2.55)	
Ever victim of sexual abuse before age 18 (%)	1.9	4.2	3.5	4.42	1.83 (.62–5.45)	
n	516	499	143			
Ever stable sexual relationship (%)	94.0	92.9	96.0	1.96	1.53 (.63–3.71)	
Current stable sexual relationship (%)	83.7	71.8	66.0	31.61***	.38 (.25–.57)	—
Serious discussion concerning separation from stable relation last year (%)	5.3	9.1	21.4	27.07***	4.88 (2.59–9.19)	4.30 (2.21–8.38)
n	453	385	98			
Ever same sex sexual partner (%)	1.6	3.0	7.3	13.30**	4.70 (1.91–11.56)	4.12 (1.59–10.69)
n	547	536	151			
Equally or more often sexually attracted to men as compared to women (%)	0.7	0.9	0.7	.18	.91 (.10–8.17)	
Ever paid for sexual contact (%)	6.2	17.0	24.0	45.69***	4.78 (2.86–7.99)	5.69 (3.24–9.97)
n	549	534	146			
More easily sexually aroused than others (%)	23.2	38.0	63.6	90.10***	5.77 (3.92–8.49)	5.49 (3.66–8.23)
Ever sexually aroused by						
. . . Exposing genitals to a stranger (%)	1.4	5.2	9.3	22.20***	6.96 (2.86–16.93)	4.66 (1.83–11.89)
. . . Spying on what others are doing sexually (%)	5.6	13.5	27.2	56.84***	6.29 (3.78–10.47)	7.12 (4.15–12.22)
. . . Deliberately using pain (%)	0.4	3.3	7.9	29.48***	23.83 (5.27–107.69)	14.16 (3.02–66.31)
Ever STD infection (%)	9.9	20.0	38.6	68.01***	5.71 (3.69–8.84)	5.11 (3.23–8.08)
n	544	529	145			
Ever consulted with professional for advice on sexuality (%)	7.4	12.8	14.7	11.13**	2.14 (1.23–3.72)	2.01 (1.12–3.58)
Satisfaction with sexual life[f]	4.67 (1.24)	4.16 (1.38)	4.42 (1.29)	20.64***	.86 (.75–.99)	.99 (.84–1.16)

General health and substance use						
Current tobacco smoker[g] (%)	18.2	21.2	30.5	10.73**	1.96 (1.31–2.96)	2.01 (1.30–3.09)
Ever substantially drunk last month (%)	23.2	37.1	53.0	55.26***	3.72 (2.56–5.42)	3.14 (2.03–4.87)
Ever illegal drug use[h] (%)	3.8	13.9	36.4	120.16***	14.38 (8.31–24.86)	11.62 (6.54–20.63)
n	548	533	151			
Problematic gambling behavior[i] (%)	8.6	11.0	15.9	7.00*	2.02 (1.19–3.42)	2.18 (1.24–3.84)
Current psychiatric morbidity[j] (%)	0.7	1.5	0.0	3.34	0.00	0.00
Satisfaction with life in general[f]	4.94 (.90)	4.70 (.93)	4.55 (1.04)	14.26***	.67 (.56–.80)	.71 (.58–.86)
Satisfaction with physical health[f]	5.19 (.88)	5.02 (.96)	4.97 (.93)	5.71**	.77 (.64–.94)	.76 (.63–.93)
Satisfaction with psychological health[f]	5.33 (.85)	5.12 (.98)	5.15 (1.02)	7.57**	.81 (.67–.98)	.83 (.68–1.01)

Note. Sample sizes are given for specific variables when missing data resulted in the loss of 10 or more men.

[a] Unadjusted ORs express the association between each variable and the likelihood for high as compared to low level of hypersexuality.

[b] Adjusted ORs were derived from multivariate logistic regression models and express the relationship between variable and high vs. low level of hypersexuality controlling for age, currently living in major city area, and current stable relationship. Adjusted ORs were only calculated for variables that had a significant unadjusted association with hypersexuality (reflected in 95% CIs not including 1.00).

[c] Larger Stockholm, Gothenburg, and Malmö areas.

[d] Rated on a three-step ordinal scale based on current or latest occupation; the higher socioeconomic position the higher score.

[e] Self-reported on a five-point Likert-type scale from very negative (1) to very positive (5).

[f] Self-reported on a six-point Likert-type scale from very unsatisfying (1) to very satisfying (6).

[g] Smoked five or more cigarettes per day during last year.

[h] Use of narcotics not prescribed to subject by physician.

[i] Spent 500 Swedish Crowns ($US 65) or more on gambling in last month.

[j] Consulted physician and was diagnosed with a psychiatric disorder during the last year.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table IV. Correlates of Hypersexuality Among 18–60-Year-Old Women in a Representative National Sample ($N = 1142$)

Variable	Level of hypersexuality			F or χ^2 (overall)	Unadjusted OR[a] (95% CI) (high vs. low)	Adjusted OR[b] (95% CI) (high vs. low)
	Low (0) ($n = 635$, 55.6%)	Moderate (1, 2) ($n = 427$, 37.4%)	High (3+) ($n = 80$, 7.0%)			
Sociodemographic characteristics						
Age (years)	39.11 (11.89)	36.21 (11.82)	30.10 (8.80)	24.69***	.93 (.91–.95)	—
Born and raised abroad (%)	7.6	5.4	8.8	2.44	1.17 (.51–2.67)	
Separation from parents during childhood (%)	13.7	19.7	30.0	16.58***	2.70 (1.59–4.58)	2.25 (1.28–3.96)
Currently living in major city area[c] (%)	27.1	28.1	32.5	1.07	1.30 (.79–2.14)	—
Current socioeconomic position[d]	1.67 (.65)	1.71 (.66)	1.63 (.70)	.76	.91 (.62–1.35)	
n	594	382	65			
Currently not studying or working (%)	8.2	8.9	11.4	.92	1.44 (.68–3.05)	
n	609	406	79			
Sexuality and relationships						
Positive parental attitudes to sex[e]	3.25 (.82)	3.30 (.90)	3.37 (.94)	.75	1.18 (.87–1.60)	
n	533	369	68			
Age 1st vaginal intercourse (years)	17.35 (2.67)	16.47 (2.36)	15.78 (2.48)	22.96***	.71 (.62–.82)	.78 (.68–.89)
n	598	412	76			
Frequency of intercourse last month	4.27 (4.20)	5.79 (6.31)	7.86 (7.11)	20.19***	1.13 (1.08–1.18)	1.19 (1.12–1.25)
n	561	389	76			
Ever victim of sexual abuse (%)	20.2	34.0	39.2	31.98***	2.56 (1.56–4.18)	2.53 (1.50–4.28)
Ever victim of sexual abuse before age 18 (%)	5.8	11.7	10.8	11.10**	1.95 (.87–4.40)	
n	582	393	74			
Ever stable sexual relationship (%)	97.9	99.1	95.0	6.50*	.40 (.13–1.23)	
Current stable sexual relationship (%)	85.4	78.6	65.8	21.44***	.33 (.20–.55)	—
Serious discussion concerning separation from stable relation last year (%)	3.6	11.1	26.9	45.49**	9.93 (4.62–21.33)	7.38 (3.28–16.60)
n	531	333	52			
Ever same sex sexual partner (%)	0.5	2.6	13.8	58.36***	33.16 (9.03–121.74)	30.35 (7.68–119.96)
Equally or more often sexually attracted to women as compared to men (%)	0.3	1.2	1.3	3.03	3.95 (.35–44.05)	
Ever paid for sexual contact (%)	0.0	0.0	0.0	—	—	—
n	629	419	78			
More easily sexually aroused than others (%)	7.7	15.2	33.8	49.71***	6.13 (3.54–10.62)	5.35 (2.97–9.63)
n	626	422	80			
Ever sexually aroused by						
. . . Exposing genitals to a stranger (%)	0.3	3.7	7.5	26.80***	25.66 (5.09–129.46)	27.81 (4.84–159.75)
. . . Spying on what others are doing sexually (%)	2.7	4.4	11.3	14.26**	4.61 (1.98–10.72)	4.45 (1.76–11.30)
. . . Deliberately using pain (%)	0.8	1.4	12.5	54.65***	18.00 (5.98–54.16)	13.36 (4.12–43.32)

Table IV. Continued

Ever STD infection (%)	15.1	24.9	32.9	23.92***	2.76 (1.64–4.63)	2.68 (1.55–4.63)
n	623	413	79			
Ever consulted with professional for advice on sexuality (%)	22.0	31.2	38.8	17.44***	2.24 (1.38–3.65)	1.67 (.98–2.82)
Satisfaction with sexual life[f]	4.47 (1.37)	4.36 (1.39)	4.39 (1.50)	.89	.96 (.81–1.13)	1.12 (.92–1.37)
n	625	422	80			
General health and substance use						
Current tobacco smoker[g] (%)	23.6	31.7	48.1	24.62***	3.00 (1.86–4.85)	3.42 (2.03–5.75)
Ever substantially drunk last month (%)	6.3	16.7	37.5	75.09***	8.88 (5.10–15.46)	5.13 (2.82–9.35)
Ever illegal drug use[h] (%)	1.1	5.9	19.0	61.64***	20.86 (8.20–53.04)	11.01 (4.15–29.17)
Problematic gambling behavior[i] (%)	3.0	2.3	0.0	2.68	0.00	0.00
Current psychiatric morbidity[j] (%)	1.3	2.3	6.3	9.34**	5.22 (1.67–16.38)	5.77 (1.53–21.76)
Satisfaction with life in general[f]	4.95 (.97)	4.78 (.98)	4.55 (1.04)	8.11***	.70 (.56–.86)	.77 (.61–.97)
Satisfaction with physical health[f]	5.00 (1.07)	4.95 (1.11)	5.18 (.95)	1.48	1.19 (.93–1.52)	
Satisfaction with psychological health[f]	5.22 (.95)	4.96 (1.08)	4.97 (1.08)	8.87***	.79 (.64–.98)	.89 (.70–1.13)

Note. Sample sizes are given for specific variables when missing data resulted in the loss of 10 or more women.

[a] Unadjusted ORs express the association between each variable and the likelihood for high as compared to low level of hypersexuality.

[b] Adjusted ORs were derived from multivariate logistic regression models and express the relationship between variable and high versus low level of hypersexuality controlling for age, currently living in major city area, and current stable relationship. Adjusted ORs were only calculated for those variables that had a significant unadjusted association with hypersexuality (reflected in 95% CIs not including 1.00).

[c] Larger Stockholm, Gothenburg, and Malmö areas.

[d] Rated on a three-step ordinal scale based on current or latest occupation; the higher socioeconomic position the higher score.

[e] Self-reported on a five-point Likert-type scale from very negative (1) to very positive (5).

[f] Self-reported on a six-point Likert-type scale from very unsatisfying (1) to very satisfying (6).

[g] Smoked five or more cigarettes per day during last year.

[h] Use of narcotics not prescribed to subject by physician.

[i] Spent 500 Swedish Crowns ($US 65) or more on gambling in last month.

[j] Consulted physician and was diagnosed with a psychiatric disorder during the last year.

* $p < .05$. ** $p < .01$. *** $p < .001$.

with 95% confidence intervals were calculated to express the strength of the association between risk factors or correlates and hypersexuality. These effect size indicators compared the high hypersexual group to the low hypersexual group (medium levels were not taken into account for the OR calculations). To control statistically for the most likely confounding variables, the comparisons between high and low hypersexual groups were also calculated from multivariate logistic regression models, controlling for the respondents' age, whether they were currently in a stable relationship, and whether they lived in a major urban center.

RESULTS

The first stage of the data analysis explored potential indicators of hypersexuality. The two most obvious indicators were the rates of intercourse and masturbation. On average, the mean frequency of sexual intercourse per month was 5.5 times for men ($n = 1130, SD = 6.2$, range, 0–63) and 5.1 for women ($n = 1028, SD = 5.4$, range, 0–50), a non-significant difference ($t = 1.61$, $df = 2156$, $p = .11$). Men reported more masturbation per month ($M = 4.9$, $n = 1{,}180$, $SD = 6.9$, range, 0–50) than did women ($M = 1.6, n = 1{,}065, SD = 3.3$, range, 0–30)($t = 14.45$, $df = 2243$, $p < .001$). Thirty-five percent of men and 61% of women reported no masturbation during the previous month. Although both correlations were small, the rate of intercourse and the rate of masturbation were negatively correlated for men ($r = -.11$, $p < .001$) and positively correlated for women ($r = .14$, $p < .001$).

Intercourse and masturbation were both significantly related to quality of life indicators, but in opposite directions. As can be seen in Fig. 1, high rates of intercourse were associated with increased satisfaction with sexual life, life in general, and physical and psychological health. In contrast, high rates of masturbation were associated with decreased satisfaction with sexual life and with life in general. Masturbation was not significantly associated with subjective ratings of satisfaction with physical and psychological health. When analyzed separately by gender, the same overall pattern of results was found for both men and women (data not shown).

It is likely that the associations between frequency of sexual intercourse or masturbation and quality of life measures could be confounded by relationship status. Looking only at men currently in a stable relationship with one partner ($n = 826$), the frequency of sexual intercourse was strongly associated with satisfaction with their sexual life ($r = .42$, $p < .001$), and showed weaker, although still positive, correlations with satisfaction with life in general ($r = .08$, $p = .016$), physical health ($r = .08$, $p = .022$), and psychological health ($r = .05$, $p = .164$). A similar pattern was found for women in stable relationships (see Table II). The correlation coefficient was only an approximate indicator of the association because, as shown by Fig. 1, the patterns tended to be non-linear. Very low levels of intercourse were associated with low satisfaction whereas there was relatively little change in sexual and life satisfaction once the rate of intercourse increased to 3–5 times a month.

Contrary to expectation, intercourse frequency within stable relationships tended to show positive relationships with indicators of substance abuse and paraphilias (see Table II). The associations, however, were small and often non-significant (particularly for females). Much stronger associations were found between these problematic variables and high rates of impersonal sex (see below).

Hypersexuality in Men

Table III presents 32 potential correlates of hypersexuality in men. An OR of, for example, .77 per year for age at first sexual intercourse could be interpreted to mean that the odds of being classified as high hypersexuality versus low hypersexuality decreased by 23% for each year delay in the onset of sexual intercourse. A 5-year delay would decrease the odds by 73% ($.77^5 = .27$).

For three out of six tested *sociodemographic characteristics*, men with high levels of hypersexuality were different from less hypersexual or non-hypersexual men. Hypersexual men were more likely to be young, having experienced separation from parents during childhood, and to live in major urban areas. With respect to the 17 *sexuality and relationship* variables, hypersexuality was significantly related to 12. The sexual experiences of high hypersexual men started early and were frequent and diverse, including increased frequencies of same-sex sexual behavior, paying for sex, exhibitionism, voyeurism, and masochism/sadism. The association between hypersexuality and paraphilic interests was strong, with ORs ranging from 6.3 to 23.8. Despite being highly sexually active, hypersexual men were less satisfied with their sexual life than were non-hypersexual men. Hypersexual men were also more likely to have had problems in current adult romantic relationships, have had an STD infection, and to have consulted a professional for advice about sexuality. In total, only 10 men (0.8%) had a homosexual sexual attraction pattern defined as having felt sexually attracted by individuals of the same sex at least as much as by persons of the opposite sex. No difference

in sexual orientation was found across the three levels of hypersexuality.

Hypersexuality in men was associated with seven out of eight *general health and substance use* variables. Hypersexual men engaged in a variety of risk behaviors, including smoking tobacco, heavy drinking, using illegal drugs, and gambling. They also reported relatively less satisfaction with physical health, psychological health, and with life in general.

The results were essentially unchanged when controlling for age, urban living, and current stable partner. For only two variables did the OR comparing the high

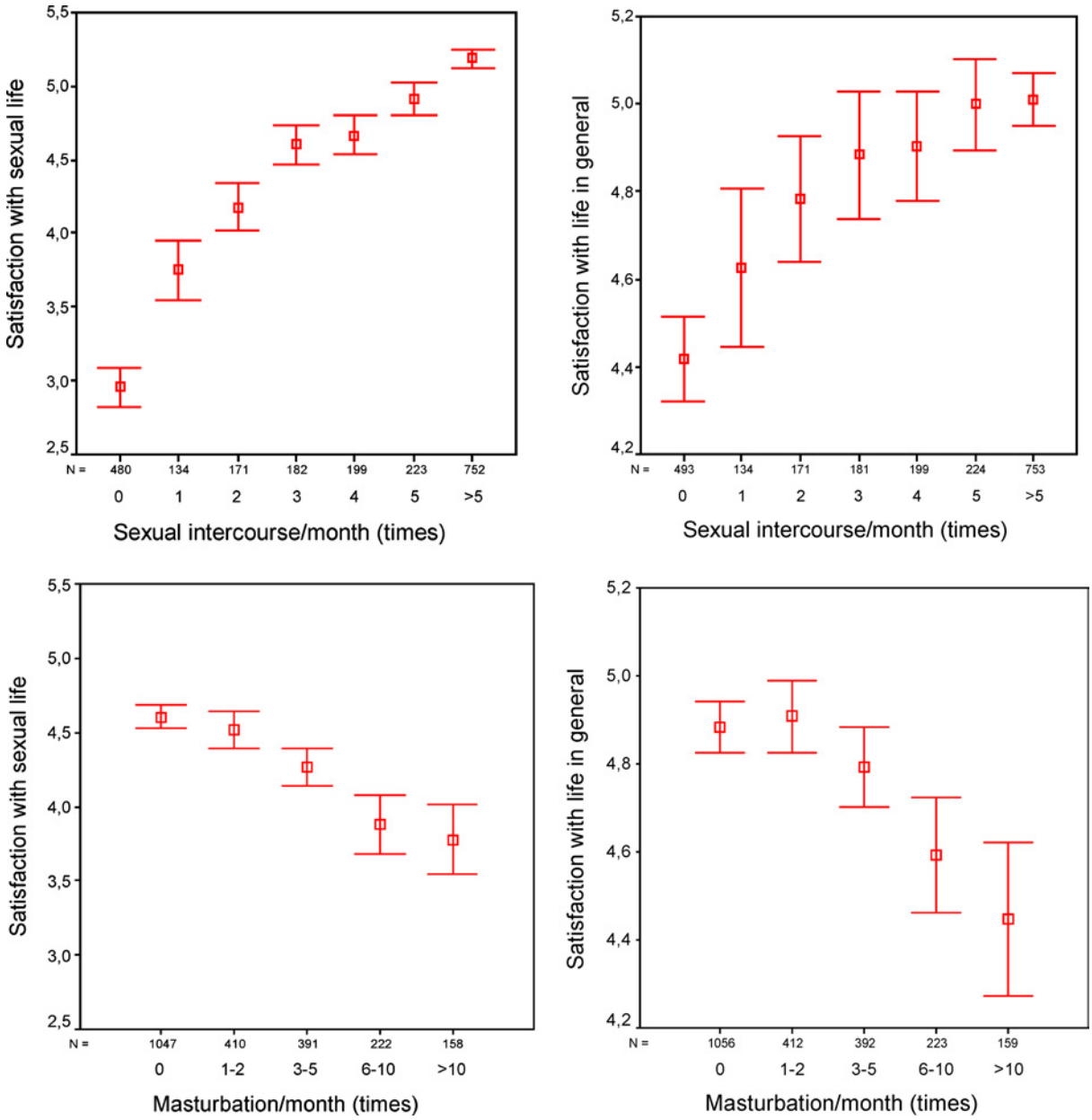

Fig. 1. Satisfaction with sexual life, life in general, and health by frequency of sexual intercourse or masturbation. Self-reports addressed sexual activity during the last month and current satisfaction with sexual life, life in general, physical, and psychological health in 2450, 18–60-year-old subjects from the general population. The dependent variables were rated on six-point Likert-type scales from very unsatisfying (1) to very satisfying (6). Error bars represent means for each activity group with 95% confidence intervals.

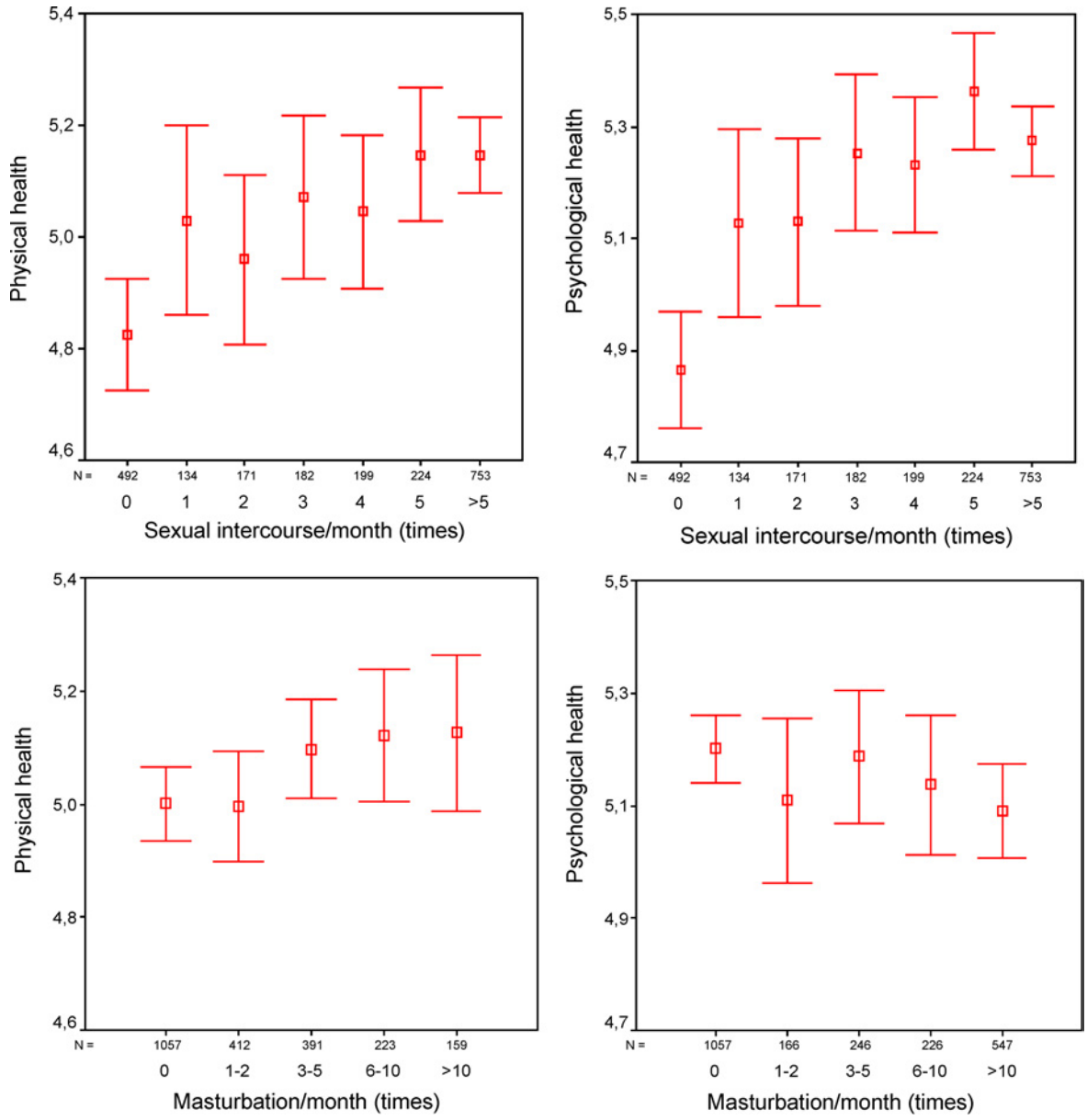

Fig. 1. Continued.

and low hypersexual groups change from statistically significant to non-significant: satisfaction with sexual life and satisfaction with psychological health.

Hypersexuality in Women

As can be seen in Table IV, the correlates of hypersexuality in women were substantially the same as those found in men. With respect to *sociodemographic characteristics*, hypersexuality in women was associated with two out of six tested variables: younger age and separation from parents during childhood. Early onset of intercourse, relationship instability, diverse sexual experiences including same-sex sexual partners, paraphilic interests, and STD infections were among the 12 out of 17 tested *sexuality and relationship* variables associated with female hypersexuality. Eight women (0.7%) had a predominantly homosexual sexual attraction pattern. Sexual orientation was not significantly related to the level of hypersexuality. Six out of eight *general health and*

substance use variables were related to hypersexuality in women, among them tobacco smoking, substance abuse, and dissatisfaction with psychological health and with life in general.

The most notable difference from the findings for men was the substantial association between hypersexuality and a history of sexual abuse for women. Hypersexuality in women was also related to an increase in psychiatric co-morbidity, whereas no such relationship was found for men. Finally, hypersexuality in women, in contrast to men, was neither associated with a lower satisfaction with sexual life nor with physical health.

The results were essentially unchanged when controlling for age, urban living, and current stable partner. Only for two variables (ever consulted with professional for advice with sexuality and satisfaction with psychological health) did the control procedure wash out the significant associations with high versus low hypersexual groups.

DISCUSSION

The main question guiding this study was whether it is possible to identify a level of sexual activity that could be considered excessive (Rinehart & McCabe, 1997). The results indicated that any definition of excessive sex should distinguish between intercourse within a stable relationship and impersonal sexual behavior. High rates of intercourse were associated with mostly desirable features (e.g., high satisfaction with sex life, life in general) and a few undesirable features (e.g., substance abuse). In comparison, the correlates of high rates of impersonal sex were undesirable (or neutral). For both men and women, high rates of impersonal sex were associated with adverse family backgrounds, a variety of negative health indicators, and dissatisfaction with life in general. High rates of impersonal sex were not associated with an increase in any desirable characteristic, except young age. Not all of the associations with undesirable features were strong, and a few (e.g., satisfaction with psychological health) were no longer significant after controlling for age, urban living, and a current stable partner. The direction of causation is difficult to infer from cross-sectional data. Nevertheless, the overall pattern of results suggest that problems with "excessive" sexuality are more likely to be connected with impersonal sex than with high rates of intercourse within stable relationships. The strong association between high rates of impersonal sex and paraphilic interests (exhibitionism, voyeurism, masochism/sadism) suggested that sexually preoccupied individuals are not only at risk for personal distress, but also pose a risk to others.

Previous clinical research has noted associations between high rates of sexual activity and anxiety and depression (Raymond et al., 2003) and paraphilias (Kafka, 1997). In addition, a study of a birth cohort (Ramrakha et al., 1998) found young adults diagnosed with depression, antisocial personality, and substance use disorder to be more than twice as likely to exhibit risky sexual behavior (defined as three or more partners during the last year combined with low frequency condom use). The present findings from a general population survey suggest that the problems found in clinical groups of individuals with high rates of sexual activity are not exclusively attributable to self-selection biases.

Associations with negative attributes are not sufficient to determine whether unusual behavior should be considered pathological, but it is one element to consider. Impersonal sex was common (most men masturbated) and, in low frequencies, impersonal sex was not associated with negative characteristics in the current data set. It was only among individuals reporting high rates of impersonal sexual behavior that the negative correlates were observed.

The indicators of hypersexuality used in the current study had face validity, and our summary measures showed expected relationships with sexuality and health risk variables, typically in a dose response fashion. The gender-specific measures, however, are not proposed as full definitions of excessive sexual behavior. The internal consistency of the measures was marginal and the available data did not include indicators of some prototypical features of hypersexuality such as the amount of time devoted to sexual activities. Researchers and clinicians constructing a definition of excessive sexual activity should consider other potential indicators, such as sexual rumination, difficulty managing sexual impulses, a high sex drive, and interference with social or occupational functioning (e.g., sexual harassment, surfing the Internet for porn rather than working) (Kafka, 1997; Stein, Black, Shapira, & Spitzer, 2001).

The rates of impersonal sex were higher for men than for women. Nevertheless, a high rate of impersonal sex was associated with essentially the same negative correlates for both genders. The major gender difference was that sexual victimization emerged more clearly as a risk factor for excessive sexuality in women. Previous population-based studies have found that sexual abuse is linked to promiscuous or risky sexual behavior (Bensley, Van Eenwyk, & Simmons, 2000; Shrier, Pierce, Emans, & DuRant, 1998) as well as to decreased sexual arousal and desire (Laumann et al., 1999) in both men and women (see

also Merrill, Guimond, Thomsen & Milner, 2003). Further research is required to determine whether women are more likely than men to respond to sexual victimization with increased sexual activity. It is also possible, however, that sexual victimization among women who engage in high rates of impersonal sex is a consequence (not a cause) of a risky lifestyle.

The current study did not identify the causes of hypersexuality or whether it is a distinct disorder. Research has yet to identify possible genetic or neuroendocrine features associated with excessive sexual behavior (e.g., Haake et al., 2003) but it is likely that hypersexuality has biological as well as psychological determinants. Hypersexuality would be expected, for example, among individuals who overvalue sex in the pursuit of happiness or use sex to compensate for other unfulfilled needs (Bancroft & Vukadinovic, 2004; Cortoni & Marshall, 2001). Bancroft and Vukadinovic (2004), for example, found that most individuals (84%) seeking treatment for "out of control" sexual behavior reported that their sexual responses increased when anxious or depressed, a pattern found only in a minority of the general population (15–25%).

There are several research traditions that may inform the interpretation of our findings. For example, it has long been noted that individuals with an antisocial, criminal orientation are likely to begin sexual intercourse early and to have many sexual partners (Glueck & Glueck, 1950). Donovan, Jessor, and Costa (1988; Costa, Jessor, Donovan, & Fortenberry, 1995) found that early onset of sexual intercourse correlated with other indicators of "psychosocial unconventionality," including substance abuse, law breaking, and poor school attendance. Gottfredson and Hirschi (1990) proposed that these associations could be explained through individual differences in self-control. Substance abuse, school dropout, sexual promiscuity, and crime are all behaviors that have short-term benefits and long-term costs.

From an evolutionary perspective, Belsky, Steinberg, and Draper (1991) proposed that early maturation and high rates of impersonal sex could be an adaptive reproductive strategy when faced with harsh environments. Rather than delaying gratification, establishing stable relationships and conforming to the demands of society, children who have been rejected and neglected obtain sexual maturity early, adopt an opportunistic approach to relationships and, as adults, invest little in parenting. Such behaviors have high costs in stable societies, but could promote reproductive success when social norms are weak and life expectancy short. They went on to suggest that the propensity for risk taking (or low self-control according to Gottfredson & Hirschi, 1990) could actually be an adaptive trait in dangerous environments (Steinberg & Belsky, 1996).

To our knowledge, this study was the first to examine the correlates of high rates of sexual activity in a representative population sample. It is important to note, however, the inherent limitations of examining a construct using a data set that was not specifically collected for the purpose. Although many of the questions were relevant, further precision would have been desirable to help disentangle alternate explanations.

The response rate was adequate, but it is possible that non-participants systematically differed from participants. Previous analyses of the present cohort found no major sexual, social, or geographic differences between responders and non-responders (Lewin et al., 1998). Although effect sizes were generally small, participants in earlier studies of sexual attitudes have been found to be somewhat more liberal, more sexually novelty-seeking, and more likely to have behavior problems than non-participants (Dunne et al., 1997; Purdie, Dunne, Boyle, Cook, & Najman, 2002).

A further limitation is that the study focused on one relatively homogenous Nordic country, and the results may not generalize fully to other populations. The rates of sexual behavior were, however, similar to those found in other countries: masturbation and intercourse in the United States (Laumann et al., 1994), intercourse in the United Kingdom (Johnson et al., 2001), and homosexuality in the United Kingdom (Wellings, Wadsworth, & Johnson, 1994) and Switzerland (Narring, Huwiler, & Michaud, 2003).

In conclusion, men and women who engage in high rates of impersonal sex report adverse backgrounds and a variety of concurrent life problems and negative health indicators. Consequently, professionals addressing sexual disorders should not only be concerned with barriers to sexual expression, but also with high levels of sexual interest and behavior, particularly when it is not directed toward a particular intimate partner. In many cases, excessive sexual behavior may be secondary to other disorders, but it is possible that hypersexuality could be a distinct disorder, worthy of its own classification, assessment, and treatment.

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