The Sexual Inhibition (SIS) and Sexual Excitation (SES) Scales: I. Measuring Sexual Inhibition and Excitation Proneness in Men

Erick Janssen  
The Kinsey Institute for Research in Sex, Gender, and Reproduction  
Bloomington, Indiana

Harrie Vorst  
Universiteit van Amsterdam  
Amsterdam, The Netherlands

Peter Finn  
Indiana University

John Bancroft  
The Kinsey Institute for Research in Sex, Gender, and Reproduction  
Bloomington, Indiana

This study involves the development and initial validation of a questionnaire measuring the propensity for sexual inhibition and excitation in men: the Sexual Inhibition & Sexual Excitation Scales (SIS/SES). The underlying theoretical model postulates that sexual response and associated behavior depend on dual control mechanisms, involving excitatory and inhibitory neurophysiological systems. The scales and their discriminant and convergent validity and test-retest reliability are described. In a sample of 408 sexually functional men (mean age = 22.8 years), factor analyses identified three higher-level factors: two related to sexual inhibition and one to sexual excitation. Multigroup Confirmatory Factor Analyses revealed that the factor structure provided an acceptable fit to the data obtained in a second (N = 459; mean age = 20.9 years) and third (N = 313; mean age = 46.2 years) sample of men, with similar distributions and relationships with other measures. Theoretical issues and areas for further research, including male sexual dysfunction and risk taking, are discussed.

Although the impact of culture on the expression of sexuality is beyond dispute, with striking cultural differences in sexual norms and values, individual differences in the capacity for sexual interest and response within any one culture are equally striking (Kinsey, Pomeroy, & Martin, 1948; Kinsey, Pomeroy, Martin, & Gebhardt, 1953). Previous attempts to evaluate this individual variability have been restricted to the measurement of attitudes and behavioral tendencies.Erotophobia-erotophilia is a well-known example (Fisher, Byrne, White, & Kelley, 1988). This construct is measured with the Sexual Opinion Survey (SOS), a questionnaire that assesses affective and evaluative (attitudinal) responses to different types of sexual activity or stimuli. The theoretical assumption underlying this construct sees it as a learned disposition or personality trait that is behaviorally manifested in approach or avoidance tendencies, resulting from varying degrees of restrictiveness and punishment during socialization. Another widely used measure, similarly derived, is the Mosher Guilt Inventory (Mosher, 1966), which is based on Tomkins’ script theory (Tomkins 1979) and assesses three types of guilt: sex guilt, hostility guilt, and morality-conscience.

This paper reports on the development and the reliability and validity assessment of a new instrument that measures individual differences in the propensity for sexual inhibition and excitation: the Sexual Inhibition and Sexual Excitation (SIS/SES) Scales. It contrasts with previous questionnaires in focusing on sexual response patterns rather than attitudes, values, and behavioral tendencies. In this respect it exemplifies the more recent era of personality research that addresses neurobiological mechanisms underlying personality traits. The most important example of this has been the work of Gray and his conceptual systems of behavioral inhibition and activation (Gray, 1982), which led to Carver and White’s (1994) establishment of an instrument (BIS/BAS) for measuring behavioral inhibition and behavioral activation as two crucial components of human personality. Another relevant example is the work of Depue and his colleagues (e.g., Depue & Collins, 1999), which aims to relate the key personality variable of positive emotionality to incentive motivation and to underlying dopaminergic mechanisms in the brain.

The theoretical model underlying the SIS/SES has been developed more fully elsewhere (Bancroft, 1999; Bancroft & Janssen, 2000). In brief, we postulate that sexual response and associated behavior in the male depends on dual control

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Address correspondence to Erick Janssen, The Kinsey Institute for Research in Sex, Gender, and Reproduction, Indiana University, Morrison Hall 313, 1165 East Third Street, Bloomington, IN 47405-3700. e-mail: ejanssen@indiana.edu.
mechanisms in the brain involving the balance of excitatory and inhibitory systems which impinge on sexual response. Considerable attention has been paid in the literature to the excitatory system(s); much less attention has been paid to the inhibitory system(s). Whereas there is substantial evidence of the existence of inhibitory mechanisms within the CNS which could form the basis of our inhibitory system (Bancroft 1999), the evidence does not permit the description and anatomic localization of our putative inhibitory system in the way that the sexual excitatory system has been described and localized (e.g., Everitt & Bancroft, 1991). This may be because the inhibitory system is both more diffuse and more complex or because there is not sufficient evidence as yet. Hence, for inhibition of sexual response in particular, and to a lesser extent for excitation of sexual response, our theoretical model depends on conceptual systems (e.g., Gray, 1982) rather than physiologically defined and anatomically localized systems.

We have identified four adaptive purposes for inhibition of sexual response in the male: (a) when the sexual situation contains a threat; (b) when there is a nonssexual threat, and inhibition of other distracting response patterns such as sex or feeding is necessary for focusing on the appropriate avoidance response; (c) when repeated sexual activity and ejaculation in a short period of time results in impaired fertility and/or distraction from other tasks; and (d) when chronic stress, such as overcrowding, results in suppression of reproductive behavior. The first two of these clearly involve information processing and appraisal of threat. The third, involving the postejaculatory refractory period, appears to be a built-in control system independent of the environment, whereas the fourth may play an important role in reducing population density. The cross-species relevance of each of these is clear, except that there is no good evidence that the fourth function is relevant to controlling human population density. Given their fundamental purposes, it would not be surprising to find that basically similar and biologically primitive mechanisms are invoked across species to implement these inhibitory functions. However, there is likely to be more than one such mechanism or at least a number of interacting mechanisms involved. It is not clear, for example, whether the first function—responding to a sexual threat—involves the same or different mechanisms as the second, where sexual response is just one of several behavioral response patterns that need to be inhibited. It is not clear whether the built-in inhibitory mechanisms underlying the postejaculatory refractory period are made use of in these other inhibitory situations. It seems probable but not definite that the inhibition associated with chronic stress is at least initiated by different mechanisms (see Bancroft, 1999, for fuller discussion of these issues).

We assume individual variability in the propensity for such inhibition (and excitation), with typical levels of inhibition proneness being adaptive, high levels associated with vulnerability to sexual dysfunction (see Bancroft & Janssen, 2000, for fuller discussion), and low levels associated with an increased likelihood of sexual risk taking (see Bancroft, 2000, for fuller discussion). Although learning may play a crucial role in determining this individual variability in response tendencies, it is also distinctly possible that individual variation in the responsiveness of our excitatory and inhibitory systems is in part genetically determined.

The need for a simple, easily applied and valid measure of propensities for sexual inhibition and excitation in order to evaluate and test our theoretical model has led to the instrument development reported in this paper. At this stage we have focused our attention on male sexual response. In the human literature in particular, most of the evidence relating to inhibition comes from males (see Bancroft, 1999). However, inhibitory as well as excitatory mechanisms are undoubtedly of importance in females, possibly even more so than in males, and we are in the process of developing a questionnaire that is suitable for use with women.

The objective of this study was to develop and examine the reliability and validity of a questionnaire that assesses individual differences in the propensity for sexual excitation and inhibition. While aware of the possibility that more than one inhibitory mechanism may be involved, we nevertheless expected that we would derive one inhibitory as well as one excitatory component, and that these would be relatively independent of each other.

**Method**

**Participants**

Four samples were recruited for this study. A first sample, consisting of male students, was used for exploratory factor analyses and the assessment of convergent and discriminant validity. A second sample of students and a third, nonstudent sample were used for confirmatory factor analyses. In addition, the third sample was used to assess the validity of our measure in an older, nonstudent group. Finally, a fourth, smaller, student sample was used for test-retest reliability. For all four samples, study protocols were approved by the Institutional Review Board.

**Sample 1.** The first sample consisted of 408 undergraduate psychology students, who received course credit for their participation. Their mean age was 22.8 years ($SD = 2.0$; range 20-38), and most were White (89%). Ninety-five percent of the men self-identified as heterosexual, 2% as bisexual, 2% as homosexual, and 1% indicated uncertain. Eighty-six percent reported they were religious (31% Catholic, 24% Protestant, 7% Jewish, 24% other), 91% were unmarried, and 50% of the men were in a sexual relationship at the time of the study.

**Sample 2.** This sample consisted of 459 undergraduate psychology students (mean age = 20.9, $SD = 2.1$, range 18-44). The sample was a combination of two smaller samples, one consisting of 309 men (mean age = 21.2, $SD = 2.5$, range 19-44) and one of 150 men (mean age = 20.4, $SD = 1.1$, range 18-22). The majority of the sample was White (82%) and received either course credit or financial compensation for their participation.
Sample 3. A random sample of men working on the same campus as that used for recruiting samples 1 and 2 was selected from telephone directories and staff lists. Return of the questionnaires was completely anonymous. Out of 967 names contacted in this way, 283 completed sets of questionnaires were obtained (completion rate = 29%). While not an adequately representative sample of university male staff, it does provide us with a sample with wider age range and socioeconomic spread than our student samples.

A further 30 sets of questionnaires were obtained during a pilot investigation of random digit dialing, which explored the feasibility of carrying out a survey using this means of sampling. The mean age of this subsample was 43.0 years (SD = 11.1; range 25-70 years). They have therefore been combined with the campus sample to form a total sample (Sample 3) of 313 men, most of them White (95%), with a mean age of 46.2 years (SD = 12.1; range 22-80 years).

Sample 4. This sample consisted of 50 separately recruited undergraduate psychology students (mean age = 21.1 yrs, SD = 2.4, range 19-33) who agreed to complete the SIS/SES questionnaire on two occasions.

Measures

SIS/SES questionnaire. Items for this questionnaire were written by a group of researchers affiliated with the Kinsey Institute. As a first step, we attempted to define a range of examples of two types of sexual situations, one of which would be potentially sexually exciting without any obvious threat involved, and the other threatening (e.g., involving risk, danger, likelihood of some form of punishment) as well as potentially sexually exciting. Second, we formulated questions to allow the participant to describe how he would typically respond in each such situation, in terms of penile erection or sexual arousal. In other words, all questions were aimed at assessing sexual response patterns typical for that participant.

The majority of the items were written in an if-then form. The if-statement describes a potentially exciting or inhibiting event, and the then-statement describes the emergence or loss of a sexual response (sexual arousal or erection). The items believed to be relevant to sexual excitation covered, among others, visual, auditory, tactile, imaginary, and olfactory stimuli, and also potentially sexually exciting social interactions. The majority of the inhibition items were written to reflect situations in which existing sexual arousal is lost due to the introduction of some interpersonal or intrapersonal threat (e.g., negative consequences of having sex, performance-related concerns, norms and values, and physical and psychological harm). Each item was rated on a 4-point scale, ranging from 1 = strongly agree, 2 = agree, 3 = disagree, and 4 = strongly disagree.

A variety of questions were tried out both with lay persons and sex researchers. On the basis of their feedback several items were rewritten, added, or deleted, leading to a final list of 73 questions.

Although we expect most adults to be able to imagine or place themselves in the majority of the situations described in the questionnaire, people can be expected to vary in how many of these situations they have actually experienced. This means that, when asking about any particular situation, some people will be able to answer from experience, whereas others will have to rely on how they imagine or think they would respond.

The Behavioral Inhibition/Behavioral Activation Scales (BIS/BAS; Carver & White, 1994). This questionnaire was used to explore the extent to which our excitation and inhibition measure would reflect specifically sexual rather than general activation/inhibition propensities, in this case, the general Behavioral Activation and Behavioral Inhibition Systems of Gray (1982). Carver and White’s questionnaire consists of two principal factors—BIS (behavioral inhibition scale) and BAS (behavioral activation scale)—but the BAS involves three sub-scales: Reward responsiveness, focusing on a positive response to the occurrence or anticipation of reward; Drive, reflecting persistence in the pursuit of desired goals; and Fun seeking, reflecting desire for new rewards and willingness to approach a potentially rewarding event on the spur of the moment. Whereas it is possible that our putative sexual inhibition and excitation systems may be manifestations of both general inhibition and activation systems in the brain, our working hypothesis was that sexual inhibition and excitation are relatively specific, and we therefore predicted only modest correlations between the BIS/BAS and SIS/SES scales.

The Neuroticism and Extraversion/Introversion Scales (of the Eysenck Personality Questionnaire; Eysenck & Eysenck, 1975). There is a fair measure of agreement in the personality literature on the heuristic value of three predominant personality traits: extraversion or positive emotionality, neuroticism or negative emotionality, and psychoticism or constraint (DePue, 1996). Gray (1987) has argued that Eysenck’s two factors of extraversion and neuroticism depend on how the factor structure is rotated, and that with further rotation two other orthogonal dimensions emerge which he labels as anxiety and impulsivity, and which he regards as having greater heuristic value. These two dimensions also better reflect his two components of behavioral inhibition and activation. Thus, we can expect Eysenck’s measures to share some common ground with the BIS/BAS, and for the reasons already given we predict low to modest correlations with the SIS/SES scales.

The Harm Avoidance Scale (from the Minnesota Personality Questionnaire [MPQ]; Tellegen & Waller, 1985). Given that we postulated that inhibition is relevant to risk taking, with low-inhibition individuals being more likely to take sexual risks and high-inhibition individuals to be sexual-risk avoiders, we wanted to assess the specificity of these traits by adding Tellegen and Waller’s Harm Avoidance Scale. This measures an individual’s likelihood of taking or avoiding risks in a general sense. This scale is one of 11 lower-order constructs from the MPQ (Tellegen
A higher-order analysis of these 11 constructs produces a three-factor structure labeled Positive Emotionality, Negative Emotionality, and Constraint. Harm avoidance, together with control and traditionalism, is part of the Constraint factor. The MPQ Harm Avoidance Scale does not correlate well with the more widely used Harm Avoidance Scale from Cloninger's Tridimensional Personality Questionnaire (TPQ; Cloninger, Przybeck, & Svrakic, 1991), which appears to be measuring negative affectivity rather than behavioral inhibition (Waller, Lilienfeld, Tellegen, & Lykken, 1991). Recent evidence shows the MPQ Harm Avoidance Scale to be significantly correlated with higher levels of behavioral inhibition on a go/no go task that involves electrical shock as punishment (Finn, Mazas, Justus, & Steinmetz, 2002). Also, the MPQ Harm Avoidance Scale has been found to be strongly negatively correlated ($r = -.74$) with the thrill and adventure seeking subscale of the Sensation Seeking Scale (Zuckerman, 1994), and also ($r = -.75$) with the venturesome-impulsivity scale of Eysenck (Finn et al., 2002). Furthermore, the MPQ Harm Avoidance Scale is significantly associated with greater electrodermal reactivity to threat of electric shock (Finn, Justus, & Steinmetz, 1998).

It is therefore safe to interpret the MPQ Harm Avoidance Scale as tapping a general tendency to inhibit any behavior which might lead to significant physical harm. We therefore expected to find limited overlap with our SIS/SES scales, with the extent of the difference reflecting the specificity of our measures to sexual risk taking.

The Demographic and Personal Information Questionnaire (DPIQ). Although our inhibition/excitement questionnaire was based on questions about typical sexual response patterns, we expect there to be a relationship between these patterns and sexual behavior. The DPIQ was designed for this study and asked for demographic information, sexual preferences, sexual activity, and sexual problems. Three questions covered frequency of sexual activity, each one referring to a typical month during the last half year (e.g., not on vacation or unusually busy): “How often did you have sexual intercourse?”; “How often did you have sex with a partner (not necessarily sexual intercourse)”; and “How often did you masturbate?” Participants could answer these questions using a 5-point scale, with possible answers including never, once, on average, once a week, two or three times a week, four times a week or more.

The questionnaire included two questions about the occurrence of erectile dysfunction. One question asks, “In your sexual activities with a sexual partner have you ever had difficulties in obtaining or keeping an erection?” The possible answers to this question were never, occasionally, less than half the time, and most of the time. The second question was “In the past three months have you experienced any difficulty in obtaining or maintaining a full erection during sexual activity?” and offered the same range of answers.

We expect individuals with a high propensity for sexual excitation to show more sexual behavior than those with a low propensity for excitation, and those high on sexual inhibition to show less sexual behavior compared with low-inhibition individuals. In addition, we predict that men with high inhibition scores are more vulnerable to sexual problems such as erectile dysfunction.

The Sociosexual Orientation Inventory (SOI; Seal & Agostinelli, 1994; Simpson & Gangestad, 1991). Our theoretical model predicts that men with a high propensity for sexual excitation and/or a low propensity for inhibition would be less restrictive in their sexual relationships and have more sexual partners than would low-excitation and high-inhibition individuals. The SOI is a measure of the individual's restrictiveness to committed sexual relationships, with low restriction indicating preparedness to engage in uncommitted and multiple sexual relationships, and high restriction the tendency to restrict oneself to a long-term, committed, exclusive sexual relationship. The SOI consists of four behavioral questions (e.g., “With how many different partners have you had sex within the past year?”) and three attitudinal questions (e.g., “Sex without love is OK.”). In addition, to restrictiveness to committed sexual relationships, our model predicts that low inhibition and high excitation individuals are more likely to take sexual risks. Seal & Agostinelli (1994) showed that the SOI predicts likelihood of sexual risk taking (i.e., unrestricted individuals are more likely to engage in unprotected sexual intercourse). Hence, this measure is also of interest in this respect. However, two of the behavioral questions in the SOI (“With how many different partners have you had sexual intercourse in the past year?” and “With how many partners have you had sex on one and only one occasion?”) and one question added to the SOI by Seal & Agostinelli (1994) (“With how many partners have you had sex during the past 3 years with whom no condoms were used?”) are more directly related to sexual risk-taking and were therefore separately analyzed.

The Sexual Opinion Survey (SOS; Fisher, et al., 1988). This questionnaire measures the disposition to respond to sexual cues along a negative-positive dimension of affect and evaluation, called erotophobia-erophilia. There is some conceptual overlap with our measure. Seven of the 21 questions specifically ask about or imply that sexual arousal is the affective response being measured (e.g., “Seeing a pornographic movie would be sexually arousing to me”; “The thought of engaging in unusual sexual practices is highly arousing”), although none of these is aimed at assessing propensity for inhibition of sexual response. The remaining questions measure more evaluative affect such as disgust, enjoyment, and entertainment. Thus, some of the questions of the SOS relate to sexual responsiveness and are included in the same single dimension of erotophobia-erophilia. This would lead us to expect some degree of overlap with our measure, particularly with sexual excitation.

The Social Desirability Scale (Hays, Hayashi, & Stewart, 1989). Given the moral significance of several of our questions (e.g., “If I discovered that someone I find sexually attractive is too young, I would have difficulty
getting sexual aroused with him/her," and "If there is a risk of unwanted pregnancy, I am unlikely to get sexually aroused"; see Appendix 1), it would not be surprising if answers were influenced by the need for social desirability. For this reason we included the 5-item version of the Social Desirability Scale.

Procedure

The men in Sample 1 completed all eight measures. They filled out the questionnaires in groups of up to 35 at a time in one study session. A similar procedure was used for the first subsample of Sample 2. The second subsample of Sample 2 was presented with the SIS/SES questionnaire as part of another study, using Computer-Assisted Self-Interviewing (CASI) methodology. Sample 3 was presented with the SIS/SES questionnaire, the BIS/BAS scales, and the DPIQ Questionnaire. In addition, they were asked as part of another study to fill out three questionnaires relevant to mood and the effects of mood on sexuality. The findings on these measures will be reported elsewhere. Sample 4 filled out the SIS/SES questionnaire, the Social Desirability scale, and the DPIQ Questionnaire during both (test-retest) sessions.

RESULTS

Factor Structure

Exploratory factor analysis. Exploration of the 408 questionnaires from Sample 1 using principal axis factor extraction and varimax rotation produced a selection of 10 factors, involving a total of 45 items (see Appendix 1). The mean Cronbach's alpha for these scales was .77. A further exploratory factor analysis was then carried out on these 10 subscale scores. This resulted in three higher level factors, two related to inhibition and one to excitation. The alphas of the three factors were in the .7 to .9 range, the factor loadings between .6 and .9, and the three factors together accounted for 60% of the variance. Details of these three higher level factors and how we labeled them are as follows.

The Sexual Excitation Factor (SES) consists of 20 items and four subscales. The first subscale consists of 9 items and contains items about social interactions (i.e., talking, seeing, having dinner, flirting) with a sexually attractive person. The second subscale consists of 4 items and pertains to excitation as a result of visual stimuli (seeing others having sex, watching movies or pictures). The third subscale consists of 4 items and includes items on how easily one gets aroused when thinking and fantasizing about sex. The fourth subscale consists of 3 items and involves excitation as a result of nonspecific stimuli (taking a shower, wearing attractive clothes, lying in the sun).

The first inhibition factor (SIS1) consists of 14 items and three subscales. The first subscale consists of 8 items and is about losing one's arousal or erection easily (i.e., need strong stimulation, need to start intercourse quickly, need to fantasize strongly). The second subscale, which is reversed, consists of 3 items and involves inhibition due to concerns during sexual interactions with a partner (low partner arousal, concerns about pleasing one's partner). The third subscale consists of 3 items and is related to performance concerns, worries, and external sources of distraction. This higher level factor was labeled Inhibition due to the Threat of Performance Failure.

The second inhibition factor (SIS2) also consists of three subscales, and includes 11 items. The first subscale consists of 4 items and is about the risk of being caught while engaged in sex (e.g., someone is nearby, when you can be seen or heard by others). The second subscale consists of 3 items and is about negative consequences of sex (e.g., risk of unwanted pregnancy, STI). The third subscale consists of 4 items and is about inhibition due to physical pain and related to norms and values (e.g., partner is too young). This higher level factor was labeled Inhibition due to the Threat of Performance Consequences.

The mean scores on the three higher level factors, calculated after the responses were reversed (from strongly disagree = 1 to strongly agree = 4), fell in the midrange of possible scores (see Figure 1). The highest possible score on the SES is 80 (20 items x scale maximum of 4). The mean score in Sample 1 was 57.2 (SD = 7.9; median = 57; range 30 - 80; a = .89). The highest possible score on the SIS1 is 56 (14 items x 4). The mean score in Sample 1 was 27.1 (SD = 4.1; median = 27; range 14 - 50; a = .81). The

Figure 1. Distribution of Scores on the SIS/SES Scales in Sample 1 (N = 408)
highest possible score on SIS2 is 44 (11 items x 4). The mean score in Sample 1 was 27.7 ($SD = 4.8$; median = 28; range 11 - 42; $a = .73$).

Table 1 presents correlations among the three factors in Sample 1. Correlations between the excitation and the two inhibition factors were low, showing excitation and inhibition, as measured, to be relatively independent. Furthermore, the correlation between the two inhibition factors was significant but modest, showing little overlap between the two inhibition scales.

**Confirmatory factor analysis.** The adequacy of the factor solution derived from Sample 1 was assessed by comparing it with plausible alternative models using multi-group confirmatory factor analytic techniques in Samples 2 and 3 (LISREL 8.14; Jöreskog & Sörbom, 1993). We expected to find two independent dimensions: sexual excitation and inhibition (Model B). An alternative hypothesis would be that inhibition and excitation are part of one dimension (Model A). The exploratory factor analyses identified a three-dimensional structure (Model C) with a substructure of 10 scales (Model D). Comparable models were also tested on a scale level (i.e., using scale instead of item scores): The 10 scales form one dimension (Model E), comparable with simple-order Model A); two dimensions (Model F, like Model B), or three dimensions (Model G, like Model C). The four models (A-D) can be combined, using the item scores again, to form three hierarchical models which can be tested using higher order factor analysis (Bollen, 1989): The ten scales form one higher order dimension (Model H), two higher order dimensions (Model I), or three higher order dimensions (Model J).

The SIS/SES means and distributions were comparable to the ones found in the first sample (Sample 2, SIS: mean = 58.5, $SD = 7.9$, $\alpha = .89$; SIS1: mean = 27.1, $SD = 5.2$, $\alpha = .78$; SIS2: mean = 27.6, $SD = 4.7$, $\alpha = .69$; Sample 3, SIS: mean = 56.3, $SD = 7.7$, $\alpha = .88$; SIS1: mean = 28.2, $SD = 5.1$, $\alpha = .83$; SIS2: mean = 28.8, $SD = 4.6$, $\alpha = .75$). Although SIS scores did not differ between Samples 1 and 2, the SES scores did ($t(864) = -2.5, p < .02$). The SES scores in Samples 1 and 3 did not differ significantly ($r(713) = .15, p > .15$), but SIS scores were higher in Sample 3 (SIS1: $t(713) = -2.97, p < .003$; SIS2: $r(712) = -2.91, p < .004$). As in Sample 1, correlations between the SES and SIS factors were low in Samples 2 and 3 (SES/SIS1: $r = .02, p > .7$ and $r = -.18, p < .001$, respectively; SES/SIS2: $r = -.03, p > .5$ and $r = -.04, p > .6$), providing additional support for the idea that excitation and inhibition are independent. Also as in Sample 1, correlations between the two inhibition factors were significant but modest in Samples 2 and 3 ($r = .34, p < .001$; $r = .31, p < .001$, respectively).

The results of the multi-group analyses, using fully constrained models, are summarized in Table 2. Higher values of NNFI, NFI, and GFI, and lower values of $\chi^2/df$ and RMSEA ($= .05$) indicate good fit. The 10-factor item model provided an acceptable fit to the data, and a better fit than the models containing fewer factors. Of the three hierarchical models, the 3-in-10 higher order model fit the data slightly better than the other two models. The scale-level models did not fit the data well. The 3-factor model, derived from the analyses of Sample 1, showed acceptable fit. The difference between estimated and recommended goodness of fit values was not large.

The results permit two conclusions. First, the 10-factor model best described the data (although it failed to meet one of the requirements for strict measurement invariance, see Table 2). The hierarchical models fit the data second best. This indicates that two structures were present in the data: a 10-factor structure and a one, two, or three higher order structure. However, this finding is impractical in that the hierarchical structure does not translate easily into a scoring key. Using item scores twice—once to estimate lower order scales and once to estimate higher order scales—does not represent the precise item-variance decomposition used to fit the model. However, the model that was found in the exploratory factor analysis on the data of Sample 1 yielded acceptable fit. This model is both in agreement with our theoretical model and feasible in practice, and therefore will be used in further analyses. The second conclusion is that the models fit adequately demonstrated measurement invariance over groups, justifying use of our questionnaire in different, demographically diverse (e.g., younger/older), populations.

**Internal Consistency**

The Cronbach alpha scores for the three scales are presented in Figure 1 for Sample 1 and in the section above for Samples 2 and 3. For SES they are consistently high (.89, .89, and .88). For SIS1 they are .81, .78, and .83 respectively, and for SIS2 they are .73, .69, and .75 respectively. The internal consistency, although acceptable for each scale, is clearly best for SES and least good for SIS2.

**Test-retest Reliability**

Sample 4 completed the SIS/SES questionnaire on two occasions. The mean number of weeks between session 1

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Table 1. Correlations Among the Three Scales (Sample 1)

<table>
<thead>
<tr>
<th></th>
<th>SES</th>
<th>SIS1</th>
<th>SIS2</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIS1</td>
<td>.97</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>SIS2</td>
<td>-.11</td>
<td>+.28</td>
<td>*</td>
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</tbody>
</table>

Note. SES = Sexual Excitation Scale; SIS1 = Sexual Inhibition Scale-1 (Inhibition due to the threat of performance failure); SIS2 = Sexual Inhibition Scale-2 (Inhibition due to the threat of performance consequences).

*aCorrelation significant at $p < .001$ (Holm's sequential Bonferroni procedure; Holm, 1979; cf. Scaman, Levin, & Serbin, 1991).
Table 2. Results of Multigroup CFA in Samples 2 and 3 (Strict Measurement Invariance)

<table>
<thead>
<tr>
<th>Model</th>
<th>Chi-square</th>
<th>DF</th>
<th>Chi/DF</th>
<th>RMSEA</th>
<th>GFI</th>
<th>NFI</th>
<th>NNFI</th>
</tr>
</thead>
<tbody>
<tr>
<td>A) 1 factor</td>
<td>7436.59</td>
<td>2025</td>
<td>3.67</td>
<td>0.085</td>
<td>0.51</td>
<td>0.54</td>
<td>0.43</td>
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<tr>
<td>B) 2 factors</td>
<td>6918.33</td>
<td>2020</td>
<td>3.42</td>
<td>0.081</td>
<td>0.63</td>
<td>0.37</td>
<td>0.46</td>
</tr>
<tr>
<td>C) 3 factors</td>
<td>6408.63</td>
<td>2016</td>
<td>3.18</td>
<td>0.077</td>
<td>0.66</td>
<td>0.41</td>
<td>0.52</td>
</tr>
<tr>
<td>D) 10 factors</td>
<td>5045.73</td>
<td>1950</td>
<td>2.57</td>
<td>0.065</td>
<td>0.73</td>
<td>0.53</td>
<td>0.65</td>
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<tr>
<td>E) 1 factor</td>
<td>1305.10</td>
<td>98</td>
<td>13.32</td>
<td>0.18</td>
<td>0.73</td>
<td>0.49</td>
<td>0.55</td>
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<tr>
<td>F) 2 factors</td>
<td>672.27</td>
<td>95</td>
<td>7.08</td>
<td>0.13</td>
<td>0.82</td>
<td>0.61</td>
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<tr>
<td>G) 3 factors</td>
<td>397.46</td>
<td>91</td>
<td>4.37</td>
<td>0.095</td>
<td>0.90</td>
<td>0.77</td>
<td>0.81</td>
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</tbody>
</table>

**Item-level simple models**

**Scale-level simple models**

**Item-level hierarchical models**

Note. Chi/DF = Chi-square/DF; RMSEA = Steiger-Lind RMSEA index; GFI = Goodness of Fit Index; NFI = Normed Fit Index; NNFI = Non-Normed Fit Index.

*The matrix of intercorrelations of latent traits (PHI) is not positive definite.*

Convergent and Discriminatory Validation

Correlations between SES, SIS1, SIS2, and other questionnaire measures completed by participants in Sample 1 are shown in Table 5.

**Social Desirability Scale.** No correlation was found between this scale and either SES or SIS1, but a weak correlation was found with SIS2, which does include questions about situations that involve breaking social norms. The other two scales are less related to social norms.

**BIS/BAS scales.** Our predictions of only modest correlations between the BIS/BAS and SIS/SES scales proved to be the case (see Table 5), with the exception of an unpredicted positive correlation between BIS and SES. The correlation with BIS is slightly higher for SIS2 than SIS1; this is consistent with the fact that two of the seven questions making up the BIS scale sound relevant to threat of performance failure (SIS1) (i.e., "I worry about making mistakes": "I feel worried when I think I have done poorly at something"), whereas four questions are more relevant to threat of performance consequences (e.g., "If I think something unpleasant is going to happen I usually get pretty worked up").

**Table 3. Test-Retest Reliability (Sample 4)**

<table>
<thead>
<tr>
<th></th>
<th>SES</th>
<th>SIS1</th>
<th>SIS2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session 1</td>
<td>57.5 (7.3)</td>
<td>58.0 (7.4)</td>
<td>+.76</td>
</tr>
<tr>
<td>Session 2</td>
<td>57.0 (4.2)</td>
<td>27.0 (4.1)</td>
<td>+.67</td>
</tr>
<tr>
<td>SES</td>
<td>+.74</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SIS1</td>
<td></td>
<td>+.67</td>
<td></td>
</tr>
<tr>
<td>SIS2</td>
<td></td>
<td></td>
<td>+.74</td>
</tr>
</tbody>
</table>

**Note.** SES = Sexual Excitation Scale; SIS1 = Sexual Inhibition Scale-1 (Inhibition due to the threat of performance failure); SIS2 = Sexual Inhibition Scale-2 (Inhibition due to the threat of performance consequences); SD between parentheses.

**Table 4. Correlations Between SIS/SES and Age in a Nonstudent Sample (Sample 3)**

<table>
<thead>
<tr>
<th></th>
<th>SES</th>
<th>SIS1</th>
<th>SIS2</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIS1</td>
<td>-.18a</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>SIS2</td>
<td>-.04</td>
<td>+.31a</td>
<td>.</td>
</tr>
<tr>
<td>Age</td>
<td>-.24a</td>
<td>+.30a</td>
<td>+.13</td>
</tr>
</tbody>
</table>

**Note.** SES = Sexual Excitation Scale; SIS1 = Sexual Inhibition Scale-1 (Inhibition due to the threat of performance failure); SIS2 = Sexual Inhibition Scale-2 (Inhibition due to the threat of performance consequences).

*Correlation significant at p < .001 (Holm's sequential Bonferroni procedure; Holm, 1979; cf. Seaman et al., 1991).
Table 5. Correlations Between SIS/SES and Other Scales
(Sample 1)

<table>
<thead>
<tr>
<th></th>
<th>SIS/SES Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SES</td>
</tr>
<tr>
<td>Social desirability</td>
<td>+.03</td>
</tr>
<tr>
<td>BIS/BAS Scales</td>
<td></td>
</tr>
<tr>
<td>BIS</td>
<td>+.21a</td>
</tr>
<tr>
<td>BAS-Reward responsiv</td>
<td>+.31a</td>
</tr>
<tr>
<td>BAS-Drive</td>
<td>+.22a</td>
</tr>
<tr>
<td>BAS-Fun seeking</td>
<td>+.25a</td>
</tr>
<tr>
<td>Eysenck Personality</td>
<td></td>
</tr>
<tr>
<td>Questionnaire</td>
<td></td>
</tr>
<tr>
<td>Neuroticism</td>
<td>-.22a</td>
</tr>
<tr>
<td>Extraversion</td>
<td>-.03</td>
</tr>
<tr>
<td>Harm avoidance</td>
<td>-.07</td>
</tr>
<tr>
<td>Sexual Opinion Survey</td>
<td>+.45a</td>
</tr>
<tr>
<td>Sociosexual Orientation</td>
<td>+.21a</td>
</tr>
<tr>
<td>Inventory (SOI)</td>
<td></td>
</tr>
</tbody>
</table>

Note. SES = Sexual Excitation Scale; SIS1 = Sexual Inhibition Scale-1 (Inhibition due to the threat of performance failure); SIS2 = Sexual Inhibition Scale-2 (Inhibition due to the threat of performance consequences).

*Correlation significant at p < .001 (Holm’s sequential Bonferroni procedure; Holm, 1979; cf. Seaman et al., 1991).

Eysenck Personality Questionnaire. We found very little relationship between extraversion or neuroticism and the SIS/SES scales apart from weak correlations between neuroticism and SES and SIS1.

Harm Avoidance Scale. Our prediction that this scale would overlap with our two inhibition scales proved to be the case. Interestingly, no negative correlation with SES was found, suggesting that SES is not simply a sexual manifestation of a thrill-seeking or venturesomeness characteristic.

Sexual Opinion Survey (SOS). The expected overlap was found with a moderately high correlation between erotophilia/erotophobia and SES. There was a weaker negative correlation with SIS2 and no relationship to SIS1.

The Sociosexual Orientation Inventory (SOI). We found the highest correlation between SOI and SIS2. Furthermore, we also found a modest correlation with SIS1. No correlation was found between SOI and SIS1.

Frequency of sexual activity (DPIQ Questionnaire). We explored the relationships between our three scales and age, as independent variables, and each of the three behavioral variables as dependent variables (see Table 6), using multiple regression. This was carried out first for Sample 1.

For sexual intercourse frequency, 45% of the men in Sample 1 reported having sexual intercourse at least once a week, with 32.7% reporting not once and 44.7% reporting four times a week or more. Five percent of the variance was accounted for in the multiple regression. The only variable to be significantly (negatively) related in Sample 1 was the SIS2 score (β = -.16; p < .005).

For any form of sexual interaction with a partner, 56% of the men in Sample 1 had been involved in any form of sexual interaction at least once a week, with 18.7% reporting not once and 21.9% reporting four times a week or more. Only 2% of variance was accounted for, and SIS1 showed a weak negative relationship (β = -.12; p < .04).

For frequency of masturbation, the majority of the men (72.7%) in Sample 1 reported masturbating at least once a week, with 10.2% reporting not masturbating at all and 27.9% reporting masturbating at least four times a week. Twenty-one percent of the variance was accounted for with SIS (β = .43; p < .0001) and age (β = .15; p < .003) being positively related.

Thus, in Sample 1, we find some weak relationships between the two inhibition scales and frequency of sexual interactions with partner, and a much more striking positive relationship between SES and frequency of masturbation.

A similar multiple regression analysis was carried out for the older men in Sample 3 (see Table 6).

For the frequency of sexual intercourse, 51% of the men reported having had sexual intercourse at least once a week, with 19.6% reporting not once and 4.8% reporting four times a week or more. Nineteen percent of the variance was accounted for in the multiple regression, with SIS1 showing the strongest relationship (β = -.16; p < .008) and SIS2 a weak relationship (β = -.13; p < .03).

For the frequency of any form of sexual interaction, 48% of the men had been involved in any form of sexual interaction at least once a week, with 20.3% reporting not once and 6.8% reporting four times a week or more. Fourteen percent of the variance was accounted for, with SES (β = .16; p < .005), SIS1 (β = -.16; p < .008), and age (β = -.19; p < .002) showing a relationship.

Table 6. Frequency and Predictors of Sexual Behavior
(Samples 1 and 3)

<table>
<thead>
<tr>
<th></th>
<th>Sample 1</th>
<th>Sample 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SES, age</td>
<td>SES, age</td>
</tr>
<tr>
<td>Frequency of masturbation (1 month)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not once</td>
<td>10.2</td>
<td>14.5</td>
</tr>
<tr>
<td>One to three times</td>
<td>17.2</td>
<td>24.5</td>
</tr>
<tr>
<td>One time a week</td>
<td>20.4</td>
<td>22.9</td>
</tr>
<tr>
<td>Two or three times a week</td>
<td>26.4</td>
<td>23.9</td>
</tr>
<tr>
<td>Four times a week or more</td>
<td>27.9</td>
<td>16.1</td>
</tr>
<tr>
<td>Frequency of sex with a partner (1 month)</td>
<td>SES, SES1, age</td>
<td></td>
</tr>
<tr>
<td>SIS1</td>
<td>38.7</td>
<td>20.3</td>
</tr>
<tr>
<td>One to three times</td>
<td>25.2</td>
<td>31.6</td>
</tr>
<tr>
<td>One time a week</td>
<td>13.7</td>
<td>18.4</td>
</tr>
<tr>
<td>Two or three times a week</td>
<td>20.4</td>
<td>22.9</td>
</tr>
<tr>
<td>Four times a week or more</td>
<td>21.9</td>
<td>6.8</td>
</tr>
<tr>
<td>Frequency of intercourse (1 month)</td>
<td>SIS2, SIS1, SIS2</td>
<td></td>
</tr>
<tr>
<td>Not once</td>
<td>32.7</td>
<td>19.2</td>
</tr>
<tr>
<td>One to three times</td>
<td>27.4</td>
<td>29.6</td>
</tr>
<tr>
<td>One time a week</td>
<td>11.7</td>
<td>22.5</td>
</tr>
<tr>
<td>Two or three times a week</td>
<td>18.5</td>
<td>23.5</td>
</tr>
<tr>
<td>Four times a week or more</td>
<td>14.7</td>
<td>4.8</td>
</tr>
</tbody>
</table>

Note. Results of multiple regression analyses with SES, SIS1, SIS2, and age as independent variables, and sexual activity as dependent variables. The Sample 1 and 3 columns present response percentages, rounded to one decimal, and significant predictors (p < .05), with + and - signs indicating the direction of the relationship.
For frequency of masturbation, the majority of the men (61%) reported masturbating at least once a week, with 14.5% reporting no masturbation at all and 16.1% reporting masturbation at least 4 times a week. With 18% of variance accounted for, both SES ($\beta = .32; p < .0001$) and age ($\beta = -.23; p < .0001$) were significantly related.

Erectile dysfunction (DFIQ Questionnaire). Although the same questions were asked of Sample 1 and Sample 3, the frequency of erectile problems was low in the younger Sample 1 and we have restricted our analysis to Sample 3 (see Table 7). The relationship between the two questions about erectile dysfunction and the SIS/SES scales plus age was also explored by multiple regression.

For the question about whether the participants ever had experienced erectile problems, 43.3% of the men reported they had experienced erectile problems occasionally, 3.6% answered less than half of the time, 3.9% answered most of the time, and 49.2% answered never. Twenty-seven percent of the variance was accounted for, and SIS1 ($\beta = .38; p < .0001$), SIS2 ($\beta = .13; p < .02$) and age ($\beta = .15; p < .007$) were all found to be related.

With the question regarding experience of erectile problems in the past 3 months, 18.1% of the men reported they had experienced erectile problems occasionally, 2.3% answered less than half of the time, 4.9% answered most of the time, and 74.8% reported they had not had any problems at all. Thirty percent of the variance was accounted for: SIS1 and age showed the strongest relationships ($\beta = .37$ and .25, respectively; $p < .0001$), with SIS2 showing a weaker negative relationship ($\beta = -.12; p < .03$).

Sexual risk-taking (SOI). The relationship between the three SIS/SES scales and each of the three questions in the SOI directly relevant to sexual risk taking was assessed using multiple regression with each behavioral variable as the dependent variable and the three scales plus age as independent variables. As with the sexual activity questions, this was carried out first for Sample 1.

Table 7. Frequency and Predictors of Erectile Problems (Samples 1 and 3)

<table>
<thead>
<tr>
<th></th>
<th>Sample 1</th>
<th>Sample 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erectile problems (ever)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>56.5</td>
<td>49.2</td>
</tr>
<tr>
<td>Occasionally</td>
<td>39.8</td>
<td>43.3</td>
</tr>
<tr>
<td>Less than half the time</td>
<td>3.0</td>
<td>3.6</td>
</tr>
<tr>
<td>Most of the time</td>
<td>.8</td>
<td>.9</td>
</tr>
</tbody>
</table>

| Erectile problems (last 3 months) | SIS1, SIS2, *age* |          |          |
|---------------------------------|------------------|----------|
| Never                           | 78.8             | 74.8     |
| Occasionally                    | 17.2             | 18.1     |
| Less than half the time         | 3.7              | 2.3      |
| Most of the time                | .2               | .49      |

Note: Results of multiple regression analyses with SIS1, SIS2, and age as independent variables, and erectile problems as dependent variables. The Sample 1 and 3 columns present response percentages, rounded to one decimal, and significant predictors ($p < .05$), with + and - signs indicating the direction of the relationship.

For number of partners in past year (mean = 2.3, $SD = 4.3$, median = 1), little of the variance in this variable was accounted for (2%) and none of the independent variables was significant in the equation for this sample.

For number of "one time" partners (mean = 2.5, $SD = 6.1$, median = 1), 14% of the variance was accounted for but only age was significantly entered into the equation ($\beta = .34; p < .0001$). This was a positive relationship; the older the student the greater the number of one-time partners.

For number of partners with no condoms in past 3 years (mean = 1.5, $SD = 2.3$, median = 1), 10% of the variance was accounted for. SIS2 was negatively related ($\beta = -.25; p < .0001$), and age was positively related ($\beta = .16; p < .002$). The results were similar after removing the two items relevant to STDs and condom use (see Appendix 1; SIS2: $\beta = -.21; p < .0001$; age: $\beta = .16; p < .002$, $R^2 = 8\%$).

Of these three variables, the third (number of partners with whom no condom was used) was the clearest indicator of sexual risk taking. As predicted, SIS2 was correlated with this measure of sexual risk taking, although the general level of risk taking in this sample was not high.

A similar multiple regression was carried out for the older participants in Sample 3. For the question regarding number of partners in past year (mean = 1.3, $SD = 2.26$, median = 1), SES entered significantly into the equation ($\beta = .18; p < .003; R^2 = 3\%$). This is in contrast to Sample 1, where none of the independent variables was significantly related. Similar to Sample 1, the number of one-time partners (mean = .45, $SD = 1.28$, median = 0) was significantly related to age ($\beta = -.15; p < .02; R^2 = 3\%$), albeit in the opposite direction. For the question concerning the number of partners with whom no condoms were used in the past 3 years (mean = 1.0, $SD = 1.04$, median = 1), SIS2 ($\beta = -.12; p < .05$) and SES ($\beta = .15; p < .02; R^2 = 5\%$) were related, indicating a slight tendency for men in this sample with high SES and low SIS2 to be more likely to take this form of sexual risk. The results were comparable after removing the two items relevant to STDs and condom use (SIS2: $\beta = -.11; p < .08$; age: $\beta = .15; p < .02$, $R^2 = 5\%$).

**DISCUSSION**

Factor Structure

Consistent with our predictions, exploratory factor analyses identified factors associated with our hypothesis of individual differences in propensities for sexual excitation and inhibition. Factor analysis identified a single excitation factor, but differentiated sexual inhibition into two factors, which we have called Inhibition Due to Threat of Performance Failure (SIS1) and Inhibition Due to the Threat of Performance Consequences (SIS2). The factors had acceptable levels of internal consistency and test-retest reliability.

Confirmatory factor analysis using Samples 2 and 3 showed the 10-factor model to be best, but only marginally better that the nested 3-in-10 model. For that reason, and
because the 3-factor model is the more practicable of the two alternatives, fits our theoretical model much better, and is a more parsimonious representation of the data, there are clear grounds for our continued use of the 3-in-10 factor model.

Distributions of scores on the three factors were very similar for Samples 1, 2, and 3. Sample 3 showed age to have an effect with a modest decline of SES scores and a modest increase of SIS1 scores related to age, both effects to be expected as a consequence of the negative impact of age on sexual arousability and the increased likelihood of erectile problems; hence, we find increased fear of performance failure (SIS1) with advancing age.

Validity

In comparison with other personality questionnaires the analyses provide strong support for discriminant validity. A degree of overlap with measures of global traits of behavioral inhibition, harm avoidance, and reward responsibility suggests that the SES scale does tap aspects of reward responsivity and the SIS scales do tap aspects of global behavioral inhibition to some extent; however, the modest degree of overlap suggests that the SIS/SES is predominantly measuring individual differences that are more specific to sexual responsivity. A puzzling finding was the positive correlation between BIS and SES. At this time we are unable to account for this association.

Comparisons between the SIS/SES and measures of extraversion and neuroticism provide additional evidence of discriminant validity of the SIS/SES scales. This is of particular importance in the case of SIS1, which might be thought to reflect manifestations of neuroticism. Indeed, given that SIS2 (due to the threat of performance consequences) reflects a more adaptive response system than SIS1 (due to the threat of performance failure), the tendency for neuroticism to relate more to SIS1, and BIS to SIS2, makes sense.

The positive correlation between SES and the Sexual Opinion Survey (erotophobia/erotophilia) was as expected, given the number of items in the SOS which directly ask about sexual arousal. The weaker negative correlation with SIS2, and the absence of a relationship to SIS1, may reflect the fact that the sexual arousal items contained in the SOS do not involve any threatening component.

The Sociosexual Orientation Inventory (SOI) correlated negatively with SIS2, which is consistent with the idea that lack of inhibition in potentially threatening situations contributes to a lack of restrictiveness in one’s attitudes to sexual relationships. The modest positive correlation with SES suggests that, although it may well be true that the level of sexual drive does not in itself adequately explain restrictiveness in this sense, we can predict low restrictiveness in individuals with high SES and low SIS2 scores.

The use of specific behavioral measures from the SOI related to sexual risk taking showed similar evidence of convergent validity. The most obvious measure of sexual risk taking—frequency of unprotected sexual intercourse—correlated with SIS2. Where simple frequency of sexual activity is concerned, we found a striking positive relationship between SES and frequency of masturbation, whereas frequencies of sexual activity involving a partner did not relate to SES but did rather weakly and negatively relate to the inhibition scales. This would suggest that the excitation system is most clearly manifested when there are no potential complicating factors, whereas the inhibitory system is more likely to be invoked, for a variety of possible reasons, when a partner is involved.

Similar results were found in Sample 3 for the relationships between the three scales and measures of frequency of sexual activity, including masturbation, and the principal measure of sexual risk taking, the number of partners with whom no condom was used, although the general levels of risk taking in these two samples were not high. These relationships need to be examined more closely in high-risk groups._

A different relationship between age and number of one-time partners was found in the older sample. In Sample 1 the older of these young men reported more one-time partners than the younger. In Sample 3 the relationship was in the opposite direction. This is presumably a weak cohort effect, indicating that the older men in Sample 3 would have been less likely to have one-time partners when they were the same age as the participants in Sample 1.

The prevalence of erectile problems in Sample 3 is very comparable to that found in other studies (e.g., Feldman, Goldstein, Hatzichristou, Krane, & McKinlay, 1994). We found, consistent with our theoretical predictions, that SIS1 was a strong predictor for erectile problems both at any time and in the past three months. SIS2 predicted modestly for lifetime erectile problems. This variable, however, proved unrelated in the older age group when only the last 3 months were considered. This is consistent with the idea that fear of performance consequences, as measured by SIS2, would cause erectile failure from time to time in a man’s life, but with a reduced likelihood of having occurred during the last 3 months. The involvement of both SES and age in the regression equation is interesting as it suggests that age is having adverse effects on erectile response beyond an age-related decline in sexual excitability.

The normal distribution of scores on each of the three scales, for each of these three nonclinical samples, indicates that this instrument is measuring response tendencies which do vary in the population, and for which one can justifiably identify a normal range in which one can assume that the response tendencies are aproblematic and potentially adaptive.

Conclusion

This paper presents a new instrument for measuring individual differences in propensity for sexual responsiveness. It differs from previous methods of assessment in two fundamental ways. First, its basis is in the theoretical model of dual control of male sexual response involving balance between central mechanisms of excitation and inhibition.
(Bancroft, 1999; Bancroft & Janssen, 2000). Second, its specific focus is on psychophysiological response patterns that are typically associated with two types of sexual situations: nonthreatening (and hence most relevant to assessing propensity for excitation) and threatening (relevant to propensity for inhibition). The three scales that emerged during this instrument development all show a close-to-normal distribution of scores in the three nonclinical samples that have been studied so far. This finding supports the idea that the middle range of each scale reflects normative or adaptive response tendencies, with the high and low ends of each scale being potentially problematic as well as less common.

The adaptiveness of these propensities is most easily recognized in relation to inhibition, on the assumption that in certain situations sexual response is inappropriate or maladaptive, and inhibition of sexual response is a biologically adaptive means of dealing with such situations. Although low excitation proneness may be maladaptive (at least in a reproductive sense) in its own right, the maladaptiveness of high excitation proneness may depend on the extent of inhibition proneness which accompanies it (e.g., high excitation in the presence of low inhibition could be problematic in many situations).

In designing and developing this questionnaire we were expecting to identify a single inhibition factor, with high inhibition proneness associated with vulnerability to sexual dysfunctions, and low inhibition to sexual risk-taking. But we found two inhibition factors, with only a modest degree of intercorrelation. The questions making up these two inhibition scales were conceptually different, so that it was readily apparent that with the first inhibition scale (SIS1) we were assessing situations where the most obvious threat was the anticipated failure of sexual response, whereas in the second (SIS2) the threat was in the anticipated consequence not of sexual failure but of sexual response—hence our two descriptive titles, Inhibition Due to Threat of Performance Failure (SIS1) and Inhibition Due to Threat of Performance Consequences (SIS2). But we need to consider what this difference means in terms of our theoretical model.

It is possible, of course, that these two scales reflect two distinct inhibitory systems. Our lack of understanding of the nature and specificity of central inhibition of sexual response should leave us open to this possibility. However, in a more detailed discussion of this issue (Bancroft & Janssen, 2000) we postulated that as the first (SIS1) factor was anticipating failure of response, the threat was intrinsic. While this could be conceptualized as a consequence of learning, it nevertheless implies an inbuilt tendency for response failure. We postulated that this could be a consequence of a basically high inhibitory tone, which could be further increased by the threat contained in the anticipation of further failure. By contrast, the second factor (SIS2) was focussing on external threats, and although in our choice of questions these were exemplifying discrete externally determined outcomes, such as the possibility of pregnancy or sexually transmitted disease, this general concept could also cover a variety of threats that derive from the sexual relationship or partner behavior (e.g., threat of rejection, humiliation, or betrayal). This approach is therefore distinguishing between an individual who typically has high levels of inhibitory tone and as a consequence has a tendency to experience incomplete or inhibited genital responses (high SIS1), and a situation which is perceived to be threatening leading to an increase in central inhibition (SIS2). We further postulated that such external threats, relevant to SIS2, might well be reducible by means of psychological treatment (e.g., of the couple), whereas the problem of high inhibitory tone might be less susceptible to psychological interventions and more responsive to inhibition-lowering pharmacotherapy. Such hypotheses are empirically testable in a clinical context.

However well we demonstrate the existence of these traits of excitation and inhibition proneness, the question of their origin remains to be answered. If learning is involved, at what stage in the developmental process are these traits established? How important are genetic factors? With recent developments in techniques for assessing genetic variants of potential relevance to sexual excitation (e.g., dopamine receptor subtypes) or inhibition (e.g., serotonin transporter genes), we can look forward to a combination of behavioral genetics, molecular genetics and early environmental studies to throw light on this potentially crucial source of individual variability in sexual responsiveness.

REFERENCES


APPENDIX

**SIS/SES Scales**

**Exploratory Factor Analysis (Principal Components; Varimax).**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy = .71

Bartlett Test of Sphericity = 837, significance = .00000

<table>
<thead>
<tr>
<th>Factor</th>
<th>Eigenvalue</th>
<th>Pct of Var</th>
<th>Cum Pct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor 1</td>
<td>2.63111</td>
<td>26.3</td>
<td>26.3</td>
</tr>
<tr>
<td>Factor 2</td>
<td>1.95701</td>
<td>19.6</td>
<td>45.9</td>
</tr>
<tr>
<td>Factor 3</td>
<td>1.29527</td>
<td>13.0</td>
<td>58.8</td>
</tr>
</tbody>
</table>

Instruction: “In this questionnaire you will find statements about how you might react to various sexual situations, activities, or behaviors. Obviously, how you react will often depend on the circumstances, but we are interested in what would be the most likely reaction for you. Please read each statement carefully and decide how you would be most likely to react. Then circle the number that corresponds with your answer. Please try to respond to every statement. Sometimes you may feel that none of the responses seems completely accurate. Sometimes you may read a statement which you feel is ‘not applicable’. In these cases, please circle a response which you would choose if it were applicable to you. In many statements you will find words describing reactions such as ‘sexually aroused’, or sometimes just ‘aroused’. With these words we mean to describe ‘feelings of sexual excitement’, feeling ‘sexually stimulated’, ‘horny’, ‘hot’, or ‘turned on’. Don’t think too long before answering, please give your first reaction. Try to not skip any questions. Try to be as honest as possible.”

**Excitation (SES)**

1. When I think of a very attractive person, I easily become sexually aroused.
2. When a sexually attractive stranger looks me straight in the eye, I become aroused.
3. When I see an attractive person, I start fantasizing about having sex with him/her.
4. When I talk to someone on the telephone who has a sexy voice, I become sexually aroused.
5. When I have a quiet candlelight dinner with someone I find sexually attractive, I get aroused.
6. When an attractive person flirts with me, I easily become sexually aroused.
7. When I see someone I find attractive dressed in a sexy way, I easily become sexually aroused.
When I think someone sexually attractive wants to have sex with me, I quickly become sexually aroused.
When a sexually attractive stranger accidentally touches me, I easily become aroused.

When I see others engaged in sexual activities, I feel like having sex myself.
If I am with a group of people watching an X-rated film, I quickly become sexually aroused.
If I am on my own watching a sexual scene in a film, I quickly become sexually aroused.
When I look at erotic pictures, I easily become sexually aroused.

When I feel sexually aroused, I usually have an erection.
When I start fantasizing about sex, I quickly become sexually aroused.
Just thinking about a sexual encounter I have had is enough to turn me on sexually.
When I feel interested in sex, I usually get an erection.

When I am taking a shower or a bath, I easily become sexually aroused.
When I wear something I feel attractive in, I am likely to become sexually aroused.
Sometimes I become sexually aroused just by lying in the sun.

Inhibition - 1 (SIS1)

Factor

I need my penis to be touched to maintain an erection.
When I am having sex, I have to focus on my own sexual feelings in order to keep my erection.
Putting on a condom can cause me to lose my erection.
It is difficult to become sexually aroused unless I fantasize about a very arousing situation.
Once I have an erection, I want to start intercourse right away before I lose my erection.
When I have a distracting thought, I easily lose my erection.
I often rely on fantasies to help me maintain an erection.
I cannot get aroused unless I focus exclusively on sexual stimulation.

If I am concerned about pleasing my partner sexually, I easily lose my erection.
During sex, pleasing my partner sexually makes me more aroused. [Reversed]
When I notice that my partner is sexually aroused, my own arousal becomes stronger. [Reversed]

If I think that I might not get an erection, then I am less likely to get one.
If I am distracted by hearing music, television, or a conversation, I am unlikely to stay aroused.
If I feel that I’m expected to respond sexually, I have difficulty getting aroused.

Inhibition - 2 (SIS2)

Factor

If I am masturbating on my own and I realize that someone is likely to come into the room at any moment, I will lose my erection.
If I can be heard by others while having sex, I am unlikely to stay sexually aroused.
If I am having sex in a secluded, outdoor place and I think that someone is nearby, I am not likely to get very aroused.
If I can be seen by others while having sex, I am unlikely to stay sexually aroused.

If I realize there is a risk of catching a sexually transmitted disease, I am unlikely to stay sexually aroused.
If there is a risk of unwanted pregnancy, I am unlikely to get sexually aroused.
If my new sexual partner does not want to use a condom, I am unlikely to stay aroused.

If having sex will cause my partner pain, I am unlikely to stay sexually aroused.
If I discovered that someone I find sexually attractive is too young, I would have difficulty getting sexually aroused with him/her.
If I feel that I am being rushed, I am unlikely to get very aroused.
If I think that having sex will cause me pain, I will lose my erection.