Biases for Affective Versus Sexual Content in Multidimensional Scaling Analysis: An Individual Difference Perspective

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ABSTRACT

Visual sexual stimuli can motivate sexual behaviors that can risk or enhance health. How one allocates attention to a sexually motivating stimulus may be important for predicting its effect on sexual feelings, sexual risk behaviors, and sexual problems. A large sample (N = 157) of men and women rated the similarity of all possible pairs of photographs of women, which had been pretested to vary in their sexual and affective content. Multidimensional scaling was used to extract two dimensions of sex and affect, including the extent to which each person relied on each dimension in making their similarity judgments. These individual weights were then used to predict sexual variables of interest. Participants who relied more on the affect information judging photograph similarity were more likely to be female, viewed erotica less frequently, reported fewer sexual partners, reported less sexual desire, and more sexual problems. Those who relied more on the erotic content in making their similarity judgments were more likely to be male, viewed more erotica weekly, experienced higher sexual desire, and were more likely to have taken an HIV test. The “double edge sword” of attention weight to affect in sexual cues is discussed for its potential to both enhance and harm sexual health.

KEY WORDS: sexual motivation; sexual risk taking; HIV; sexual functioning
INTRODUCTION

People are thought to differ in the extent that they attend to emotional or sexual dimensions of intimate relationships. For example, men may be more likely to view these as separable dimensions (Hendrick & Hendrick, 2002). Attention to these dimensions also may shift over time. For example, romantic relationships could evolve from greater attention to sexual aspects to more attention to emotional aspects of the relationship (Fisher, 2000). Preferential focus on either emotional or sexual aspects of a potentially sexual situation could impact decisions to engage in risky sexual behaviors. In the present study, multidimensional scaling was used to examine (1) whether the processing of these two dimensions when viewing a visual sexual stimulus were separable experimentally and (2) whether individual differences in attention to each dimension meaningfully predicted sexual feelings and sexual risk behaviors.

Incentive salience theory suggests that the role of dopamine is to tag reward-related stimuli. This has the function of increasing the salience of the stimuli and, hence, the motivation to pursue them (Berridge, 2007). Some have interpreted incentive salience as suggesting that positive (pleasant) stimuli themselves induce approach motivation (Ode, Winters, & Robinson, 2012). However, approach motivation also occurs during negative affect like anger (Harmon-Jones & Allen, 1998). A stimulus being positive or negative, then, does not determine the level of motivation experienced in response to it. This appears consistent with the general description of emotions as action predispositions (Frijda, 1986), which includes avoidance motivation for emotions like fear. Some have argued that sex should be viewed as an emotion (Everaerd, 1988). There remains wide disagreement about the nature of sex as an emotion, motivation, or something else. Thus, it is unclear whether motivating and affective aspects of a sexual stimulus can be meaningfully separated.
While sex stimuli have a strong bias to be processed as pleasant, situations exist where sex stimuli are experienced as negative. Adding to the complex picture, sex stimuli also can provoke high levels of mixed (simultaneously positive and negative) emotional responses (Cacioppo & Bernston, 1994; Larsen & McGraw, 2011). In fact, mixed emotions in response to sexual stimuli appear common (Peterson & Janssen, 2007; Staley & Prause, 2012). Furthermore, reported responses to sexual stimuli and physiological responses to those same stimuli often diverge (e.g., Chivers, Seto, Lalumiere, Laan, & Grimbos, 2010). The present study examined whether these dimensions can be distinguished during the processing of sexual stimuli, and if this distinction is useful for characterizing differences in sexual feelings and behaviors.

If these dimensions of sexual and affect are separable, they should meaningfully predict related feelings and behaviors. High attention to the sexual and low attention to the affective cues from a potential sexual partner could be problematic as suggested by research concerning sexual interest. The more men attend to sexual aspects (revealed skin) than affect dimensions of potential sexual targets, the greater their over perception of the sexual interest of those targets (Treat, McFall, Viken, & Kruschke, 2001). Other persons who struggle to regulate compulsion-like sexual behaviors also tend to focus on sexual, rather than emotional, aspects of intimate interactions, which also may lead to risky sexual behaviors (Långström & Hanson, 2006). Sexual risk behaviors also may be more likely to occur, for instance, if the sexual content of communication is over perceived, such as when consuming alcohol (Abbey, Zawacki, & Buck, 2005).

On the other hand, focusing on emotional rather than sexual cues of a partner also may be problematic. For example, expecting emotional intimacy following a sexual interaction with a brief partner can cause sexual regret (Eshbaugh & Gute, 2008). Hypervigilance and reactivity to
emotional cues with intimate partners also can contribute to dissatisfaction with intimate relationships (Donegan et al., 2003; Herpertz et al., 2001), including motivating risky sexual behaviors (Sansone & Wiederman, 2009). Thus, if sexual and affective dimensions of sexual cues are separable, disproportionate attention to one or the other dimension may be related to greater sexual risk behaviors. More attention specifically to the sexual dimension would relate positively to sexual drive; more attention to the affective dimension would relate negatively to sexual functioning and feelings. While data tend to suggest attention to sexual or affective aspects of stimuli are reciprocal, this need not be the case. For example, sexual satisfaction might be highest for those who are able to integrate information from both affect and sexual content. Therefore, the statistical tests were selected that allow each dimension to predict the feelings and behaviors in opposing, or congruent, directions.

Performance-based tasks, like multidimensional scaling, enrich the study of cognitive factors by providing insight beyond introspective self-report. Multidimensional Scaling (MDS) describes a group of mathematical techniques to uncover underlying structures in data sets (Sturidsson et al., 2006). Each point in an MDS solution represents one item, positioned according to its weight on each of n-dimensions thought to characterize the larger data set. MDS now has been used in a handful of applied studies, such as characterizing men at risk for HIV with alcohol consumption (Cromley, Schensul, Singh, Berg, & Coman, 2010) and loss of semantics in Alzheimer’s Disease (Hornberger, Bell, Graham, & Rogers, 2009). The specific parameters of the analysis are important to accurate interpretation (Davis, 2009; Goodwill, Alison, & Humann, 2009). MDS can be used in an exploratory or confirmatory manner. In the present study, stimuli were selected to determine whether an MDS solution could be created that adequately characterized a group of sexual photographs along the two dimensions of affect and
sexual content. Then, the utility of such a model was examined by testing whether the attention individuals give to the sexual or affective dimension was related in theoretically expected ways to their sexual feelings and behaviors. Consistent with the literature reviewed, this suggests that those who attend more to sexual aspects of visual sexual stimuli should report more sexual drive and risky sexual behaviors. Those who attend more to the emotional aspects of visual sexual stimuli are more likely female, report more sexual difficulties, and also report more sexual risk behaviors.

**METHOD**

**Participants**

A total of 157 (N = 47 male, 1 transgender) psychology students over age 18 years participated in exchange for course credit. Most reported being heterosexual. Four males reported being homosexual and four reported being bisexual. Five females reported being bisexual and one was “uncertain.” Recruitment materials disclosed that participants would be viewing sexual images. Most participants reported being “White” (N = 136, 86.6%), consistent with the local population. Most were in a monogamous relationships (N = 105, 67.3%) and reported having sex “several times per month” on average over the last year (see Table 1 for additional demographic information).

**Measures**

*Demographic and Sexual History Form*

This questionnaire requested demographic and limited sexual history information to characterize the sample. Demographic questions included age, education, and relationship status. Sexual information questions included number of lifetime sexual intercourse partners, masturbation frequency, and frequency of viewing erotic images or films. Included was the
question “Have you had sex (oral, anal, genital) before age 16 when you did not want to because someone forced you in some way or threatened to harm you if you didn’t?” from a published questionnaire (Wolfe & Kimmerling, 1997) that has been used as a brief assessment of sexual abuse history (Rellini & Meston, 2007).

Sexual Desire Inventory (SDI Spector, Carey, & Steinberg, 1996)

This questionnaire measures static levels of sexual desire using two, 7-item self-report scales: the Solitary Sexual Desire scale, which measures an individual’s desire for autoerotic sexual activity, and the Dyadic Sexual Desire scale, which measures an individual’s desire for sexual activity with a partner. Scores on the SDI are not dependent upon participants being sexually experienced. The two subscales were internally consistent (Cronbach’s α: Dyadic scale = .86; Solitary scale = .96) and modestly correlated (r = .35), which suggests that they capture different variance and may be thought of as measuring separable constructs. The Dyadic subscale is commonly used as an index of trait sexual desire level (Giargiari, Mahaffey, Craighead, & Hutchison, 2005; Prause, Janssen, & Hetrick, 2008).

National AIDS Behavior Survey (NABS-II Catania et al., 1992)

Sexual risk behaviors were assessed using 14 core items from the NABS and supplemented by individual questions as described above for more in-depth assessments of sexual risk. To enhance participants’ understanding, questions demonstrated to cause confusion (e.g., "vaginal intercourse") (Binson & Catania, 1998) included definitions (e.g., “penis in vagina”). Only a subset of participants received these questions, which were added to assess predictive utility for risk behaviors after the initial MDS model appeared to be supported.

Female Sexual Function Index (FSFI Rosen et al., 2000)

The FSFI was used as a measure of sexual problems in women in the sample. This 19-item
scale, with a total score range of 2 to 36, contains 6 subscales and was initially constructed by exploratory factor analyses of 29 investigator-generated items. Questions inquire about sexual functioning over the last 4 weeks and must be corrected for sexual inexperience (Meyer-Bahlburg & Dolezal, 2007). Psychometrically, the total scale and subscales (sexual desire, subjective sexual arousal, genital lubrication, orgasm, sexual satisfaction, and sexual pain) exhibited acceptable internal consistency (all $\alpha \geq .82$) and test-retest reliability at two to four week intervals ($r = .76$ to $r = .86$). Limited convergent validity was suggested by high correlations with the Sexual Desire and Interest Inventory and the Changes in Sexual Function Questionnaire and discriminant validity was supported by the lack of relationship with the Locke-Wallace Marital Adjustment Scale (Clayton et al., 2006). The FSFI also has been shown to differentiate groups of women with and without sexual dysfunction (Wiegel, et al., 2005) and to evidence changes before and after treatment periods (Cayan, Bozlu, Canpolat, & Akbay, 2004). However, the high correlations between the sexual arousal and sexual desire subscales, their failure to differentiate consistently as separate factors through factor analysis (Wiegel, Meston, & Rosen, 2005), the low internal consistency of the desire scale, the failure of the desire scale to differentiate low sexual desire women from women with other sexual problems (Meston, 2003), and the inclusion of other sexual desire measures in this study precludes the use of those subscales from the FSFI.

International Index of Erectile Function. (IIEF Rosen et al., 1997)

The IIEF was used as a measure of sexual problems in men in the sample. This 15-item scale assesses erectile functioning (or dysfunction) experienced by the participant in the last four weeks. Items were generated from existing questionnaires and qualitative data and five domains emerged from an exploratory factor analysis: erectile function, orgasmic function, sexual desire, intercourse satisfaction, and overall satisfaction. All subscales exhibited high internal consistency (all $\alpha \geq .90$)
and moderate test-retest reliability ($r = .64$ for orgasmic functioning to $r = .84$ for erectile functioning). Discriminant validity for erectile dysfunction was demonstrated, except for the sexual desire subscale, presumably because patients with low desire were screened out of the sample (Rosen et al., 1997). The questionnaire converged with clinician ratings of sexual functioning and diverged from marital satisfaction and social desirability.

Stimuli

The first hypothesis asked whether sexual and affective dimensions of visual sexual stimuli could be separated. No stimulus set exists that varies the sexual and valence dimensions of stimuli systematically. To ensure that the visual sexual stimuli fully represented the spectrum of sexual and affective content, publicly available sexual images were screened by the authors and research assistants. Stimuli were limited to photographs of women alone only. Alternatives included limiting the photographs to heterosexual stimuli or limiting the study sample to heterosexual men or women. Enrolling only men or women would limit the generalizability of the results. Expanding the stimulus set to include nude men is problematic. First, nude male images specifically active feelings of homophobia (Mahaffey, Bryan, & Hutchison, 2005). Second, women report that images of nude men are more obscene than nude female images (McDowall, 2008). Third, complex interactions exist with the gender of the person in the photograph, including their body position and amount of clothing present (Dunwoody & Pezdek, 1979), which makes controlling the presented gender desirable. Finally, while no data directly answer whether the proportion of visual erotica is more likely to show male versus female, males overwhelming view more visual erotica than women (Peter & Valkenburg, 2010; Wolak, Mitchell, & Finkelhor, 2007). This suggests that visual erotic images are more likely to portray nude females, so photographs of nude males also would be differentially novel as compared to photographs of nude females. In other words, nude images of
males and females differ in many ways other than their gender; these interact with the gender of the viewer in such a way that simply including nude males would not balance the stimulus set. Thus, while examining stimulus type and sexual orientation differences could be an interesting extension of this research, we chose to develop a more tightly controlled stimulus set. Participant gender was included as a factor in analyses as this was likely to be of interest to those conducting research on gender differences.

All stimuli showed individual women in black and white. No women had anything inserted in their genitalia, none were actively stimulating themselves sexually, none portrayed stimulation by another person or device, and all were oriented with their body facing the camera. Stance varied from standing to lying down with the vulva more visible in some women than others although stance was not varied systematically with valence. This characterization is unusually specific compared to many studies which report their sexual stimuli as unpublished pilot data (e.g., Lang, Searles, Lauerman, & Adesso, 1980; Macapagal, Janssen, Fridberg, Finn, & Heiman, 2010). The “sexual” dimension was operationalized as how sexual the image would be perceived and ranged from not at all sexual to very sexual. These were determined empirically using ratings (see below), but generally images rated as more sexual showed some portion of the breast skin whereas images rated as not sexual did not. Also, some images showed portions of the vulva and all of these were rated as more sexual. The “affect” dimension was operationalized as the direction of felt emotion and varied from unpleasant to pleasant. The procedure for stimulus selection is described further below with the ratings data to demonstrate the results of the selection process. The final stimulus set is available from the corresponding author on request.

**Procedure**
Upon arrival to the lab, participants completed an informed consent statement. The person then was taken into a private testing room to complete questionnaires on a computer. The experimenter reassured participants that their responses could not be viewed by the experimenter at the time and were encouraged to ask questions. Online administration also increases the accuracy of reporting socially undesirable behaviors (Locke & Gilbert, 1995; Schroder, Carey, & Vanable, 2003). The participant completed these in private, signaling when they were complete. The experimenter returned to start the ratings task. They were provided with a response device (RB730 Response pad, Cedrus, San Pedro, CA) with one row of buttons to limit responding. After reviewing the instructions with them, the experimenter solicited questions, then left the participant to complete the task privately.

The task consisted of self-paced rating of the similarity of two photographs on a 7-point scale ranging from “Very similar” to “Not at all similar.” After 25 stimuli were selected by pilot data (see below), a new set of participants provided similarity ratings. All possible pairings of 25 pictures were presented in random order by DMDX software. A break was provided halfway through the task to reduce rater fatigue although the entire task was generally completed in around 15 minutes. After completing this task, the participant was compensated and left. This study was approved by the university's Institutional Review Board's Human Subjects Committee.

**Pretest**

Two-hundred stimuli were selected from public websites reflecting 50 in each of four categories: Pleasant-Sexually activating, Pleasant-Sexually inhibiting, Unpleasant-Sexual activating, Unpleasant-Sexually inhibiting. Only five stimuli were needed for each class, as this would result in 95 (assuming symmetry) similarity ratings for the subsequent MDS analysis. At a speed of one rating every 2 seconds, this would ensure participant attention was maintained over a
short task time. This large candidate stimulus set was independently rated on two, continuous dimensions by 80 undergraduates from a psychology pool. Specifically, they were instructed:

Next we would like you to rate some photographs. For each picture, you will rate how pleasant then how sexual you think it is. When rating how sexual a picture is, this does not mean how sexually aroused you are by the picture. Sexual only means how much sexual content is in the picture.

The dimensions included a sexual dimension ranging from “not at all sexual” to “very sexual” and an affect dimension ranging from labels “Very unpleasant” to “Very pleasant”. The task was self-paced and both ratings were made for each picture. The resulting averages are shown for each photograph in Figure 1.

**Pilot study**

Stimuli were selected from the pilot stimuli to populate the entire state-space (see Fig. 1). Selecting extreme cases would have reduced the information available to MDS analysis. For example, if all the photographs were rated as maximally dissimilar, this would provide little information about the configuration of the cognitive space. The stimuli selected for the multidimensional scaling comparisons were compared (see Table 2). Specifically, t-tests (Bonferroni corrected to $p < .0125$) were conducted to ensure that the stimuli were rated significantly differently on the intended dimensions. Photographs intended to be sexual were rated as significantly different from those not intended to be sexual on the sexual dimension, $t(10) = 13.01, p < .001$, but not on the affect dimension, $t = 2.1$. The stimuli intended to be more pleasant were rated as significantly more pleasant than stimuli intended to be unpleasant, $t(10) = 9.32, p < .001$, but did not differ in their ratings of sexual content, $t = 2.1$.

**Data Analysis**
Responses were reviewed for anomalies consistent with not following task instructions (e.g., responding that all photos were maximally similar to one another). Ratings data were transformed to distances with reflective symmetry assumed. An Individual Difference Scaling (INDSCAL) algorithm (Carroll & Chang, 1970), which was applied to the proximity matrices of all participants. In the INDSCAL, Euclidean distance was assumed with ordinality (Sturidsson et al., 2006). Distance ties were broken and iterations were run to converge when s-stress change < .001 or 100 iterations, whichever occurred first. A two-dimensional solution was specified consistent with the stimuli standardized to portray affect and sexuality. Individual, standardized weights on these two dimensions were analyzed.

RESULTS

Multidimensional Scaling Group Space

The group space solution for two dimensions yielded an s-stress of .37. For this solution, the average s-stress across individuals was .29 ($R^2 = .53$). The addition of a dimension resulted in comparable stress (.29) and variance explained (.55), not justifying the addition of the third dimension. In the two-dimensional solution, one dimension appeared consistent with a sexual dimension and the other dimension appeared consistent with an emotional dimension (see Fig. 2). Across all participants, the sexual dimension (.33) was slightly more heavily weighted than the emotional dimension (.20) in judging similarity.

Variable Distributions

Both the sexual dimension weights (Skewness [SE] = -.03 [.22]; Kurtosis [SE] = -.01 [.43]) and the emotion dimension weights (Skewness [SE] = .62 [.22]; Kurtosis [SE] = -.56 [.43]) were normally distributed. The behavioral variables, however, were not normally distributed. Specifically, the hours of visual sexual stimuli view per week (81.8% zeros) and
number of sexual partners (27.3% zeros) included many zeros. As a result, analyses were conducted using bootstrapping procedures, a distribution-free approach (Mooney & Duval, 1993). This was implemented in R (R Development Core Team, 2011) using 10,000 samples with replacement in generating each test statistic distribution.

**Predicting Theoretically-Relevant Individual Differences**

Quantifying attention weight in MDS essentially shows to what extent an individual was using one dimension or another in rating picture similarity. For example, consider rating the similarity of two images with each woman at similar stages of undress, but one appears smiling and the other appears to be on the verge of crying. Someone who rated these images as very similar could be characterized as having attention weighted towards the sexual aspect of the images. Someone who rated these images as very dissimilar could be characterized as having attention weighted towards the affective component of the stimuli. Overall, attention weights to the sexual and affective dimension were negatively related to one another, $r(156) = -.39, p < .001$.

Individuals' attention weight to the sexual or affective dimension did not vary by age (see Table 3). However, the amount of hours viewing visual sexual stimuli per week was negatively related to the attention weight to the affective dimensions of the sexual stimuli and positively related to attention weight to the sexual dimension of the stimuli. Desire for sex with a partner was negatively related to attention to the affective dimension whereas desire for masturbation was both negatively related to attention to the affective dimension and positively related to attention to the sexual dimension. Women attended more to the affective aspect of the stimuli than men, whereas men attended more to the sexual aspect of the stimuli (see Table 4). A history of forced sex was not related to attention to the different aspects of the stimuli.
With respect to sexual risk behaviors, more lifetime sexual intercourse partners was related to less attention weighted towards to the affective dimension of the stimuli (see Table 4). While this was not likely due to an interaction with age (not significant in previous analyses), sexual partners in the last year only also was negatively related to attention to the affective dimensions of the stimuli. Those who had taken an HIV test also attended more to the sexual aspect of the stimuli than those who had not taken an HIV test.

**DISCUSSION**

Sexual and affective cues in visual sexual stimuli appear separable using multidimensional scaling techniques. Two dimensions adequately characterized the similarity ratings of a series of photographs of women alone. Individuals' attention to each dimension predicted theoretically-related demographic, sexual risk, and sexual function variables. Specifically, participants who relied more on the affect information in judging photograph similarity were more likely to be female, viewed less erotica weekly, and reported fewer sexual partners, reported less sexual desire, and more sexual problems. Participants who attended more to the sexual information were more likely to be male, viewed more erotica weekly, experienced higher sexual desire, and were more likely to have taken an HIV test.

Attending more to one dimension or the other does not appear to offer universal benefit or drawback. As sexual desire increases, so do some sexual risk behaviors. Viewing visual sexual stimuli at home may provide some benefits, but also may reach an excessive point. Thus, it is unclear whether viewing visual sexual stimuli is something that should be discouraged or promoted. Laboratory studies usually document increases in positive feelings following erotica exposure (Allen et al., 2007) and self-reports of an expanded sexual repertoire coincide with increased VSS use (Weinberg, Williams, Kleiner, & Irizarry, 2010). However, more hours of
viewing sexual content online is also related to feelings that sexual behaviors are out of control (Cooper, Griffin-Shelley, Delmonico, & Mathy, 2001). Although the data do not indicate that focus on one dimension or the other was necessarily advantageous, it may be useful to shift attention once a particular problem has been identified. For example, some have been able to shift attention from alcohol cues in abstinent alcoholics (Schoenmakers et al., 2010). If a goal was to reduce/eliminate the hours a person spent viewing sexual stimuli, a similar dot-probe attention task (e.g., Prause, et al., 2008) could be used to both reduce attention to the sexual dimension and/or increase attention to the affective dimension of sexual stimuli. Thus, multidimensional scaling might help identify targets for change in some problematic sexual behaviors.

The stress value of the two-dimensional model was high compared to early publications and those using simulated data. However, the stress values appeared consistent with clinical applications studying attractiveness (stress .11 to .13, Potter, Corneille, Ruys, & Rhodes, 2007), mate preferences (stress .01 to .03, Lippa, 2007), and similarity to classmates (stress .15 to .21, Lease, McFall, & Viken, 2003). Stress values might be reduced in future studies by encouraging, and ensuring, participants to use the full range of response options in rating stimulus similarity. Despite our use of a button box, a substantial minority of our participants responded with a restricted range, often limited to only two rating numbers. Perhaps this has occurred, unobserved, in previous studies as well.

The photographic stimuli were entirely single women. Many studies using the popular International Affective Picture System (Lang, Bradley, & Cuthbert, 1999) use different stimuli for the men and women in their sample. However, the norms from the IAPS show arousal is rated as significantly greater for the erotic female than the erotic male slides. The best way to
determine whether limiting the photographs to women impacted the study would be to have participants complete the pilot and similarity ratings task with each gender.

It is notoriously difficult to quantify sexual risk (Catania et al., 2005; Schroder, Carey, & Vanable, 2005). The present approach examined individual risk variables separately, as has been recommended (Catania et al., 2005) rather than trying to use a summary indicator. However, room remains for interpretation. For example, the mere fact that a person took an HIV test could indicate conservative sexual behaviors of someone who also would consistently use condoms. However, given that attention towards the sexual aspects of the stimuli was associated with other high risk indicators, HIV testing is more consistent with an interpretation that greater attention to the sexual dimension is associated with more sexual risk.

Due to low variance in sexual difficulties in the men in the sample, conclusions regarding sexual dysfunction must be tempered. The Sexual Desire Inventory might be able to discriminate sexual difficulties from other arousal disorders (Kuczyk, Simon, & Merseburger, 2010), so it also could be viewed as a potential clinical indicator. However, that scale is not typically used with clinical populations. SDI data appeared consistent with what was identified by the Female Sexual Function Inventory: attention to the affective dimension was associated with lesser sexual desire and lower sexual functioning. Future studies could specifically recruit a clinical sample to allow better examination of the potential clinical relevance of the MDS approach.

While counterintuitive, the fact that consuming alcohol before sexual encounters was not related to the MDS dimension weights appears consistent with recent research. Several research groups reported that alcohol presence/dose alone does not predict sexual risk behaviors (George et al., 2009; Prause, Staley, & Finn, 2011). This may be consistent with “alcohol myopia” (Steele & Josephs, 1990) interpretations of alcohol and risk, which suggests that the effects of alcohol on
sexual risk depend on the individuals' predisposition at baseline. In fact, MDS may be a particularly useful technique for assessing the baseline intentions that alcohol is suggested to interact with in producing sexual risk behaviors.

The individual differences analyses were limited by the sample’s behavioral profile more generally. For example, while sex risk behaviors were characteristically positively skewed, risk behaviors in this sample were extremely low. Specific recruitment for more Gaussian distribution would support testing for non-linear patterns, interactions between dimensions, and increase statistical power for tests.

The multidimensional scaling approach appeared to allow separation of sexual and affective dimensions of sexual stimuli. These stimuli were selected specifically to vary in these dimensions to determine whether they could be instantiated, so a next step would be to identify more naturalistic visual stimuli to see whether these dimensions would emerge in a less controlled stimulus set. Individual subjects' attention to the sexual and affective dimensions also provided some predictive utility for sexual history, feelings, risk behaviors, and sexual dysfunctions. Thus, the MDS method may be useful in studies specifically targeting these variables as a performance method of evaluating individual predispositions.
REFERENCES


structure, and evidence of reliability. *Journal of Sex & Marital Therapy, 22*, 175-190.


Table 1

*Sample demographic information.*

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
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<tbody>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td>109</td>
</tr>
<tr>
<td><strong>Heterosexual (self-identify)</strong></td>
<td>142</td>
</tr>
<tr>
<td><strong>Has taken HIV test</strong></td>
<td>16</td>
</tr>
<tr>
<td><strong>Never drink alcohol before sex</strong></td>
<td>26</td>
</tr>
<tr>
<td><strong>Forced to have sex</strong></td>
<td>18</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>24.7</td>
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<tr>
<td><strong>Number of lifetime intercourse partners</strong></td>
<td>1.25</td>
</tr>
<tr>
<td><strong>Hours of visual sexual stimuli viewed/week</strong></td>
<td>0.6</td>
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<tr>
<td><strong>Sexual desire inventory: Dyadic subscale</strong></td>
<td>38.8</td>
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<tr>
<td><strong>International Index of Erectile Function</strong></td>
<td>51.9</td>
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<tr>
<td><strong>Female Sexual Function Inventory</strong></td>
<td>27.5</td>
</tr>
</tbody>
</table>

\(a\) Range = 0 to 62. \(b\) Range = 5 to 75, Fewer than 5 male participants who reported erectile problems by any published cutoffs for the IIEF. \(c\) Range = 2 to 36, Twenty-five women (26% of women) scored less than 26 typically used as a clinical cutoff for sexual problems (Wiegel, Rosen, & Meston, 2005).
Table 2

*Ratings of the sexual and affective content of photographs used in the multidimensional scaling comparisons by intended category*

<table>
<thead>
<tr>
<th></th>
<th>Sexa</th>
<th></th>
<th>Pleasanta</th>
<th></th>
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</thead>
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<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
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<tr>
<td>Sexual, pleasant</td>
<td>6.86</td>
<td>0.9</td>
<td>5.34</td>
<td>0.39</td>
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<tr>
<td>Sexual, unpleasant</td>
<td>5.84</td>
<td>0.87</td>
<td>2.71</td>
<td>1.08</td>
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<tr>
<td>Nonsexual, pleasant</td>
<td>1.83</td>
<td>0.76</td>
<td>5.66</td>
<td>0.82</td>
</tr>
<tr>
<td>Nonsexual, unpleasant</td>
<td>1.76</td>
<td>0.68</td>
<td>2.44</td>
<td>0.7</td>
</tr>
</tbody>
</table>

a*Ratings could range from 1 to 7.*
Table 3

*Bootstrapped correlations between multidimensional scaling dimension weights and sexual variables*

<table>
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<tr>
<th>Dimension</th>
<th>Pleasantness</th>
<th>Sexual</th>
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<tbody>
<tr>
<td></td>
<td>Correlation</td>
<td>CI</td>
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<td><strong>Theoretical</strong></td>
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<td></td>
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<tr>
<td>Age</td>
<td>0.1</td>
<td>-.14 - -.15</td>
</tr>
<tr>
<td>Hours visual erotica/week</td>
<td>-0.21*</td>
<td>-.34 - -.08</td>
</tr>
<tr>
<td>Sexual desire inventory: Dyadic</td>
<td>-0.27*</td>
<td>-.34 - .08</td>
</tr>
<tr>
<td>Sexual desire inventory: Solitary</td>
<td>-0.26*</td>
<td>-.38 - -.06</td>
</tr>
<tr>
<td><strong>Risk</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lifetime intercourse partners</td>
<td>-0.21*</td>
<td>-.3 - -.03</td>
</tr>
<tr>
<td>Last year intercourse partners</td>
<td>-0.22</td>
<td>-.47 - .01</td>
</tr>
<tr>
<td>Last year sex partners</td>
<td>-.24*</td>
<td>-.49 - -.01</td>
</tr>
</tbody>
</table>

* p < .05
Table 4

*Bootstrapped t test between multidimensional scaling dimension weights and sexual variables*

<table>
<thead>
<tr>
<th>Dependent</th>
<th>Dimension</th>
<th>Sexual</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pleasantness</td>
<td>Sexual</td>
</tr>
<tr>
<td></td>
<td>t</td>
<td>CI</td>
</tr>
<tr>
<td>Theoretical</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-3.48</td>
<td>-1.11 - .03</td>
<td>Female &gt; Male</td>
</tr>
<tr>
<td>Forced sex</td>
<td>0.35</td>
<td>1.64 - 1.81</td>
</tr>
<tr>
<td>Risk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Took HIV test</td>
<td>-0.92</td>
<td>-1.00 - 0.04</td>
</tr>
<tr>
<td>Alcohol before sex</td>
<td>0.41</td>
<td>-0.06 - 0.09</td>
</tr>
<tr>
<td>Dysfunction</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Female sexual problem¹ | 1.9 | .001 - .11 | Dysf > Functional | -1.33 | -0.07 - 0.01 |¹ Determined by Female Sexual Function Inventory cutoff score of 26. The male measure (International Index of Erectile Functioning) did not yield a sufficient number of men reporting sexual difficulties to test.
Figure captions

*Figure 1.* Average ratings of pilot photographs.

*Figure 2.* Group space plot labeled by intended category (U=Unpleasant; P=Pleasant; N=Nonsexual; S = Sexual).
Figure 1.

Ratings of all candidate photographs

Selected photographs

Mean Pleasant Rating

Mean Sex Rating