

Incorporating Emotions Specific to the Sexual Response into Theories of Emotion Using the Indiana Sexual and Affective Word Set

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Abstract The sexual response includes an emotional component, but it is not clear whether this component is specific to sex and whether it is best explained by dimensional or discrete emotion theories. To determine whether the emotional component of the sexual response is distinct from other emotions, participants ($n = 1099$) rated 1450 sexual and non-sexual words according to dimensional theories of emotion (using scales of valence, arousal, and dominance) and according to theories of basic emotion (using scales of happiness, anger, sadness, fear, and disgust). In addition, ratings were provided for newly developed scales of sexual valence, arousal, and energy. A factor analysis produced four factors, together accounting for 91.5% of the variance in participant ratings. Using logistic regression

analysis, we found that one word category or factor, labeled “sexual,” was predicted only by the new sexual arousal and energy scales. The remaining three factors, labeled “disgusting,” “happy,” and “basic aversive” were best predicted by basic (or discrete) emotion ratings. Dimensional ratings of valence, sexual valence, and arousal were not predictive of any of the four categories. These results suggest that the addition of sexually specific emotions to basic emotion theories is justified and needed to account fully for emotional responses to sexual stimuli. In addition, the findings provide initial validation for the Indiana Sexual and Affective Words Set (ISAWS), supporting its use in future studies.

Keywords Emotion theory · Sexual stimuli · Valence · Arousal · Affect · Indiana Sexual and Affective Words Set

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Introduction

While it is generally accepted that the sexual response includes an emotional component (Everaerd, 1988; Frijda & Sundararajan, 2007; Janssen, Everaerd, Spiering, & Janssen, 2000), it remains to be established how it is best characterized. Indeed, it is not agreed upon whether the subjective experiences or emotions involved with the sexual response, especially sexual arousal and desire, are specific to sex or merely reflect non-sexual affect or emotions associated with general arousal and genital response (Janssen, Prause, & Geer, 2007). Historically, theories of emotion have not given much consideration to sex even though, for example, the state of sexual arousal fits the definition of emotion as delineated by most emotion theorists (Everaerd, 1988). For example, the state of sexual arousal aligns with theories that characterize emotional responses as “specific and consistent collections of physiological responses triggered by certain brain systems when the organism represents certain

objects or situations” (Damasio, 2000), and those acknowledging that these responses affect the entire body, using neural and hormonal signals in varied and complex patterns (Damasio, 2000; Öhman, Flykt, & Lundqvist, 2000). Despite these similarities between what is known about the sexual response and other emotional states, two of the most prominent groups of emotional theories, theories of basic (or discrete) emotions and dimensional theories of emotion, make little or no mention of the sexual response outside of its inclusion under the umbrella term “approach behaviors.” Thus, our current conceptualizations of emotion fail to account for a major and potentially distinct category of emotion.

While basic and dimensional emotion theories are alike in their apparent exclusion of sexual emotions, they are different in many other ways. Dimensional theories, although existing in different forms (Bradley & Lang, 2000; Mehrabian & Russell, 1974; Osgood, Suci, & Tannenbaum, 1957; Russell, Peplau, & Cutrona, 1980; Wundt, 1896), are all based upon the more general premise of an approach/avoidance system (Bradley & Lang, 2000; Schneirla, 1959), where an organism approaches stimuli that are pleasant or positive and avoids or defends against those that are unpleasant or negative in variable degrees of intensity or behavioral strength (Miller, 1959; Osgood et al., 1957; Schneirla, 1959). These two elements are used to define the most common axes in an emotional space: valence (indexing positivity and negativity, or hedonic value) and arousal (Osgood et al., 1957).

The two dimensions of valence and arousal were originally isolated for their ability to mathematically account for a wide range of subjective evaluations of emotional material. *Valence* accounted for the largest amount of variance when used as a bipolar scale from pleasant to unpleasant (Miller, 1959), though it has also been described as two unipolar, orthogonal scales (Dickson & Dearing, 1979; Konorski, 1967; Watson, Wiese, Vaidya, & Tellegen, 1999). Osgood et al.’s (1957) second dimension was *arousal*, also accounting for a significant portion of variability in evaluative ratings. Arousal, sometimes labeled as intensity or energy level, is nearly universally accepted as an inherent component of emotion, and some have argued that it is the most important (Arnold, 1945; Duffy, 1941; Lindsley, 1951). A third dimension of *dominance* has been introduced (Bradley & Lang, 1999a, 1999b; Lang, Bradley, & Cuthbert, 2005) and has been included in research focusing on the development of emotional stimulus sets, but is used much less frequently than valence and arousal.

While evidence for a dimensional organization of human emotion originated from this ability to mathematically account for subjective ratings of emotional stimuli, dimensional models have also received support from studies of language categorization (Ortony, Clore, & Collins, 1988; Shaver, Schwartz, Kirson, & O’Connor, 1987) and from research using peripheral physiological measures, such as heart rate, respiratory rate, and skin conduction. Notably, these models have been used successfully with a number of different stimulus types,

including pictures (Lang et al., 2005), words (Bradley & Lang, 1999a), and sounds (Bradley & Lang, 1999b).

In contrast to dimensional theories, theories of basic emotions (also referred to as primary, categorical, discrete, or prototypical emotions) propose that emotions are best approached as being categorically distinct. Additionally, theories of basic emotions propose that emotions have been evolved for their adaptive value, are rooted in biology (and thus can be generally considered universal across cultures), and, at least in the views of some, can be combined to form more complex, or blended, emotional responses (Ekman, 1999). Theories of basic emotion have been strongly influenced by studies of facial expression, rooted in the work of Darwin (1872), who investigated the universality of facial expressions across a range of cultures. Contemporary research on facial expression of emotions has found support for its universality in infants across cultures (Camras, Oster, Campos, Miyake, & Bradshaw, 1992; Field, Woodson, Greenberg, & Cohen, 1982; Meltzoff & Moore, 1977), preliterate, media-isolated cultures (Ekman, 1992; Ekman & Friesen, 1971), and even in non-human primates (Chevalier-Skolnikoff, 1973; Ekman, 1973; Redican, 1982). This growing body of evidence has been used to argue not only for the universality of facial expressions (Dolan & Morris, 2000), but also for the universality of the emotions underlying these expressions. While varying from theory to theory, a limited set of basic emotions is usually included, the most common being happiness, fear, anger, disgust, and sadness.

Another source of evidence for the existence of discrete or basic emotions comes from research on the effects of various forms of brain injury. A number of studies have shown that damage to specific brain regions can result in the impairment of specific emotions while leaving others intact. For example, Huntington’s Chorea (Sprengelmeyer et al., 1996), damage to the insula (Calder, Keane, Manes, Antoun, & Young, 2000; Calder, Lawrence, & Young, 2001), and damage to the basal ganglia (Fredericks, Kalmar, & Blumberg, 2006; Sprengelmeyer, Rausch, Eysel, & Przuntek, 1998) can all cause a loss of the perception and expression of disgust, while leaving the perception and expression of other emotions unaltered. Likewise, patients with amygdala damage can show fear-specific deficits and sometimes lesser impairments of anger or disgust (Adolphs, Tranel, Damasio, & Damasio, 1994; Calder et al., 1996; Young et al., 1995), but these deficits do not carry over to other emotions, such as sadness or happiness.

Despite extensive empirical results supporting both basic and dimensional theories of emotion, it is unknown if sexual emotions can be accounted for by these theories (Janssen et al. 2007). Some have postulated that emotions evoked by sexual stimuli merely consist of high-arousal, positive-valence emotion (Carrette, Hinojosa, & Mercado, 2003; Rowland, Cooper, & Slob, 1996), while others have noted that there can be a positive association between negative affect and sexual arousal (Heiman, 1980; Koukounas & McCabe, 2001; Laan &

Everaerd, 1995). While these two findings seem incongruent, current theories allow for the idea of separate positive and negative emotion systems as opposed to a single, bipolar continuum (Watson et al., 1999), a notion that is supported by empirical evidence (Larsen, McGraw, & Cacioppo, 2001; Schimmack, 2005; Scollon, Diener, Oishi, & Biswas-Deiner, 2005). From this perspective, the co-occurrence of both positive and negative affect with the processing of sexual stimuli is entirely plausible. In fact, a number of studies have reported and discussed the possibility of concurrent positive and negative emotions, also referred to as ambivalence, with sexual stimuli and sexual experience (Janssen et al., 2000; Koukounas & McCabe, 2001; Mosher & MacLan, 1994; O'Sullivan & Gaines, 1998; Peterson & Janssen, 2007). As such, this leaves open both the possibility that emotions related to the sexual response could be accounted for by a dimensional theory and the possibility that a sexual emotion could be included as a basic emotion.

Currently, emotions associated with the sexual response do not have a clear place in either of these two groups of emotional theories. As such, it is difficult to theoretically or experimentally differentiate between emotions that may be sex specific and those that only accompany, but are not specific to, the sexual response. That being said, research has begun to account for the nonsexual, emotional aspects of the sexual response by using emotional stimuli, as opposed to neutral stimuli, as a control condition, and have used both dimensional (Walter et al., 2008) and basic emotion approaches to generate those controls (Stark et al., 2005). These controls, however, necessitate that the emotional component of the sexual response is accounted for in these theories of emotion. Currently, however, there are no stimulus sets available that account for either basic or dimensional emotions and also include emotions related to the sexual response (either as a component of basic or dimensional theories or as a separate entities). This lack of appropriately controlled stimuli has greatly limited the conclusions experimenters are able to draw from studies of the emotional component of the sexual response, even when using emotional control stimuli.

The purpose of the present study was twofold. First, it aimed to evaluate if, and to what degree, basic and dimensional theories of emotion can account for emotions related to the sexual response. Second, it aimed to introduce and make available to other researchers the Indiana Affective and Sexual Word Set (ISAWS), a database of sexual and affective words that have been characterized using a combination of basic, dimensional, and sexual emotion ratings.

Method

Participants

Participants were 1099 native-English-speaking undergraduate students at Indiana University recruited through the Depart-

ment of Psychological and Brain Sciences' subject pool (516 female, 583 male; M age = 19.6 years, SD = 2.0, range, 18–50). All participants signed informed consent and received course credit for participation. The Indiana University Human-Subjects Committee approved all experimental procedures.

Apparatus

The ISAWS includes a collection of 1450 English words or phrases. Of these, 135 words were chosen as control words from the Affective Norms for English Words (ANEW), a database of words originally characterized according to the dimensions of valence, arousal, and dominance (Bradley & Lang, 1999a) and, more recently, in terms of the basic emotions of happiness, fear, anger, disgust, and sadness (Stevenson, Mikels, & James, 2007) using subjective affective ratings. These 135 words were chosen to cover a broad range of valence (e.g., cancer [negative], hat [neutral], success [positive]) and arousal (e.g., fatigued [low arousal], thought [medium arousal], triumphant [high arousal]) ratings. Additionally, a number of words within these controls have been previously categorized as neutral, eliciting one basic emotion, or eliciting a blend of emotions. These control words were also preselected to have little to no sexual connotation, which was later confirmed (maximum sexual energy rating = 4.05 with the word “thrill”). These control words will provide a means to ensure reliability of participants' ratings. Control words can be found in the supplementary database of ISAWS, with ISAWS numbers above 9000.

The remaining 1315 words and phrases incorporated a range of categories and include, but are not limited to: romantic relationships (e.g., girlfriend), familial relationships (uncle), sexual relationships (lover), sexual anatomy (vagina), sexually transmitted diseases (HIV), contraception (condom), sex toys (dildo), erotica (Playboy), sexual activities (intercourse), sexual orientation (straight), sex-related personal adjectives (horny), non-sex-related personal adjectives (trustworthy), as well as many others. For a complete list of words and phrases, see the supplementary database of ISAWS.¹

Participants rated words from the ISAWS using a total of 11 affective scales, including three emotional dimension scales, five basic emotion scales, and three sexual emotion scales. All scales ranged from 1 to 9. The three emotional dimension scales were valence (1 = extremely negative, 5 = neutral, 9 = extremely positive), arousal (1 = not at all arousing, low energy, 9 = extremely arousing, high energy), and dominance (1 = not at all dominant, 9 = extremely dominant), presented using the Self-Assessment Manikin (SAM), as has been previously used with these dimensional ratings (Lang et al., 2005). The five basic emotions were happiness (1 = not at all happy,

¹ The complete supplementary database of words and ratings is available from the corresponding author upon request.

9 = extremely happy), fear (1 = not at all fearful, 9 = extremely fearful), anger (1 = not at all angry, 9 = extremely angry), disgust (1 = not at all disgusting, 9 = extremely disgusting), and sadness (1 = not at all sad, 9 = extremely sad), as previously used (Stevenson & James, 2008; Stevenson et al., 2007). It was explained to participants that these were unipolar scales. That is, ratings of 1 meant that the word did not elicit that emotion, as opposed to an opposite emotion. For example, a happiness rating of 1, “not at all happy,” was explained to *not* necessarily mean that the word or phrase was negative. As such, both a neutral word and an extremely negative word would receive a happiness rating of 1.

In addition, three sexual emotion scales were created, including sexual valence (1 = extremely sexually negative, 5 = sexually neutral, 9 = extremely sexually positive), sexual arousal (1 = not at all sexually arousing, 9 = extremely sexually arousing), and sexual energy (1 = no sexual energy, 9 = extreme sexual energy). These three scales attempted to mirror the dimensional scales of valence and arousal. The sexual energy scale was included to ensure that valence effects due to positive connotations associated with “sexual arousal” were minimized. The (non-sexual) arousal scale describes the “arousal level or energy level” (Lang et al., 2005) of a stimulus, and by presenting the sexual version of the arousal dimension as two separate scales, sexual arousal and sexual energy, we made it possible to capture differences in participants’ interpretation of these two constructs.

Procedure

Each participant, after completing a questionnaire asking for basic demographic information and after having received information about the experimental procedure, rated a unique, randomized subset of words from the ISAWS. Words were presented on a Macintosh computer using Matlab 5.2 (Natick, MA) on the upper half of a computer screen, with one of the emotional scales presented on the bottom half of the screen. Word order and word-scale pairings were randomized, that is, both the word and the rating scale were randomized on each trial. Unipolar ratings (including all except valence and sexual valence scales) were scaled from 1 (not at all...) to 9 (extremely...). Bipolar valence and sexual valence ratings were scaled from 1 (extremely negative and extremely sexually negative, respectively) to 5 (neutral and sexually neutral, respectively) to 9 (extremely positive and extremely sexually positive, respectively). Participants were asked to rate a given word on a given scale by pressing the number on the keyboard that corresponded with their subjective rating and were asked to press 0 in the event that they were unfamiliar with the word presented. Once the participant rated the word, the next word-scale pair was presented after a brief pause. Participants rated words for 45 min, with the total number of words rated depending on the individual’s speed of rating (M number of ratings per partici-

pant = 909, $SD = 227$, including ratings of 0), after which the participant was thanked and given course credit.

Results

For all word and scale combinations, an average of 62 ratings ($SD = 11$) were collected, from similar numbers of men and women, excluding ratings of 0 (indicating the participant was not familiar with the presented word). Thus, for each of the 1450 words, there were approximately 62 ratings for each scale. Word recognition rates, mean ratings, and SD were computed for each word and scale combination (see supplemental database for a complete overview of the ratings).

To test inter-study reliability, dimensional and basic emotion ratings of the 135 control words were compared with ratings previously collected in other studies. The mean ratings of valence, arousal, and dominance were compared with Bradley and Lang’s (1999a) ratings on the respective scales, and the mean ratings of happiness, fear, anger, disgust, and sadness were compared with Stevenson et al.’s (2007) respective ratings (the previous ratings of basic emotions were collected on a 5-point scale and, as such, were multiplicatively converted to a 9-point scale for comparison). To assess the consistency of ratings, a simple correlation was computed for each rating scale. Previous ratings were highly consistent with those found in the current study (mean $R^2 = 0.72$), suggesting a high level of reliability across experiments. Also, a mean valence rating of 4.8 ensured that the ISAWS were not skewed according to valence.

In order to account for a possible variation in ratings across different parts of speech, word pairs varying only in their part of speech were compared (i.e. the noun sex compared to the adjective sexual or the verb penetrate compared to the noun penetration). Noun-adjective ($n = 56$) and noun-verb ($n = 30$) comparisons were made using a paired-sample t -test. No significant differences were found, suggesting that there were no differences in ratings according grammatical classification of words. No other grammatical classes were compared due to insufficient number of comparable word pairs, with the third-most-common being an adjective-verb comparison ($n = 4$).

In order to determine which, if any, of the rating scales could be accounted for by variability in other emotional scales, a factor analysis was conducted with ratings collapsed across participants, and each of the 1450 words used as separate cases. Four significant factors were extracted by principal component analysis using an orthogonal varimax rotation with Kaiser normalization (converging in 18 iterations). These four components, labeled based on the following logistic regression as “sexual,” “basic-aversive,” “happy,” and “disgust,” accounted for 91.5% of the variance of ratings (see Fig. 1).

While this factor analysis provides a descriptive structure for the ratings, it does not provide information about how each individual emotion rating contributed to the factors. In order to

investigate these contributions, a two-step process was implemented. Words were first sorted according to their factor weights with the four categories extracted from the factor analysis, and then a logistic regression was run to determine which emotional ratings predicted the category with which words were affiliated.

In an effort to objectively categorize each word according to the factors, the factor scores (consisting of correlation coefficients describing the ability of each of the four factors to account for all 11 individual ratings for that word) were used to categorize the words with which one (and only one) factor significantly accounted for the ratings. Words were considered within a category if they met three criteria. First, a single factor score correlation had to exceed 0.7 (primary-factor score >0.7), ensuring that a factor accounted for a high amount of variability within ratings. Second, none of the remaining three factor score correlations could exceed 0.5 (secondary-factor score <0.5), filtering words that were predicted by more than one primary factor. Third, the difference between the primary factor score correlation and the second-highest factor score correlation must exceed 0.3 (primary-factor–secondary-factor score >0.3), ensuring the primacy of the primary factor. A fifth, null category was defined as including all words that did not meet the above criteria for the other four factors. Examples of words from each category are presented in Table 1.

Next, a logistic regression was run to determine which emotion scales predicted membership in each of the four groups, using the null group as the reference category. Each of the four groups was predicted by a distinct pattern of emotion scales (see Fig. 2). The first group was positively predicted by ratings

of sexual arousal ($p < .004$) and sexual energy ($p < .001$), while it was negatively predicted by four of the five basic emotions, including happiness ($p < .001$), fear ($p < .007$), anger ($p < .001$), and disgust ($p < .001$). As such, the first category will be referred to as the “sexual” word group (see Fig. 2a). The second group was positively predicted by the basic-aversive emotions of fear ($p < .02$) and sadness ($p < .001$), with anger approaching significance ($p < .08$), as well as the dimension of dominance ($p < .01$). This set of words was negatively predicted by the remaining two basic emotions of happiness ($p < .001$) and disgust ($p < .001$), as well as by sexual energy ($p < .01$). As such, the second group will be referred to as the “basic-aversive” word group (see Fig. 2b). The third group was positively predicted by the basic emotion of happiness ($p < .001$) and negatively by the emotional dimension of arousal ($p < .02$) and by sexual energy ($p < .04$). As such, the third group will be referred to as the “happy” group of words (see Fig. 2c). Finally, the fourth group was positively predicted by the basic emotion of disgust alone ($p < .03$), with trends towards negative prediction by the dimensions of arousal ($p < .06$) and dominance ($p < .09$). As such, the fourth group will be referred to as the “disgust” word group (see Fig. 2d). The scales of valence and sexual valence did not significantly predict, either positively or negatively, affiliation with any category.

Although the assessment of sex differences was beyond the scope of this study, to provide future researchers with sufficiently detailed descriptive information, the supplementary database provides a split into male-only and female-only ratings. Furthermore, sex differences were calculated for each word, on each rating scale, to provide a means with which

Fig. 1 Factor analysis of the ISAWS

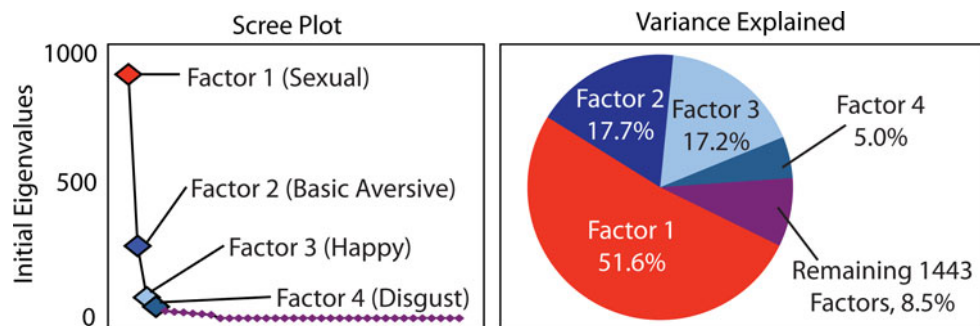
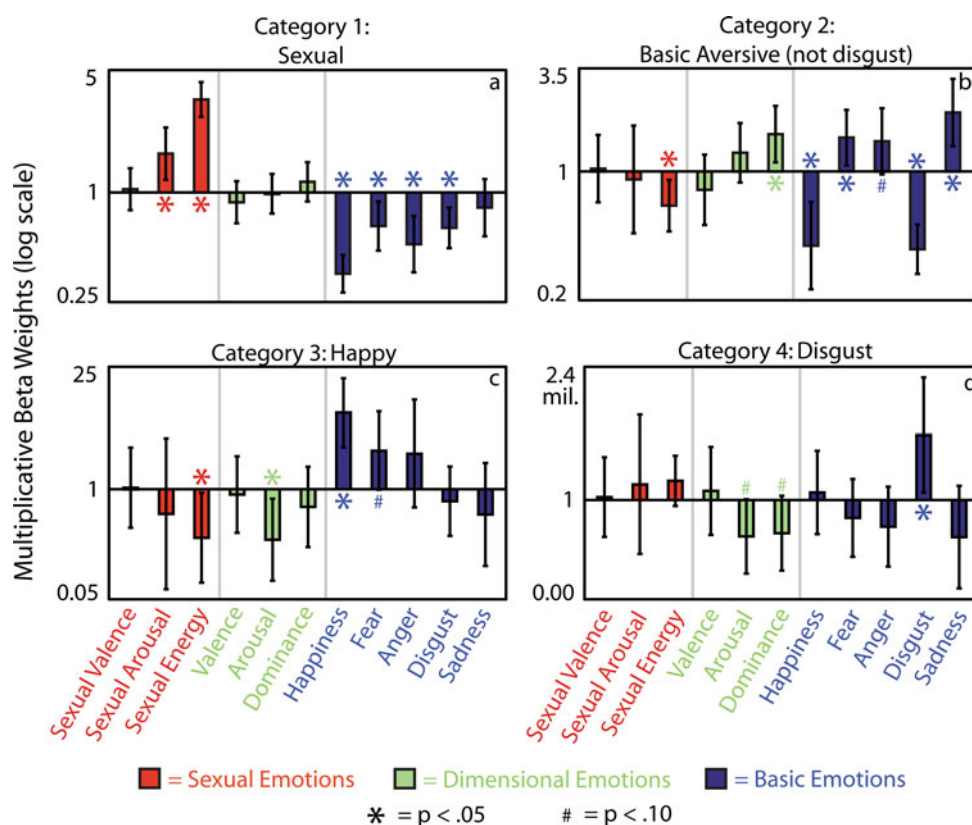


Table 1 Word category examples

Category labels	Category 1: Sexual	Category 2: Basic aversive	Category 3: Happy	Category 4: Disgusting	Uncategorized: Null
Example words	X-rated Nympho Booty call Exotic dancer Casual sex	Abortion Pain Asphyxiation Bomb Rejected	Niece Infant Diploma Pancake Miracle	Fanny fart Poop Tampon Urine Manure	Startled Scissors Plain Paper Bland
Item count	639	200	30	8	573

Fig. 2 Subjective ratings predict word-category affiliation. Each of the four word categories was predicted by a distinctive pattern of emotional ratings. The predictive β -weight of each rating scale (seen as individual bars) on each category is shown. β -weights significantly greater than one indicate that as the mean rating for a given scale increased, so too did the probability that a word was affiliated with a given category. Conversely, a β -weight significantly less than one implies that, the more positively a word was rated on that given scale, the less likely affiliation is with that given word category. Finally, β -weights not significantly different from one indicate that a given scale had no predictive ability for affiliation with the given category



experimenters may ensure that sex differences are controlled in future studies.

Discussion

This study explored the ability of dimensional and basic-emotion perspectives to account for the emotional component of the sexual response. Our findings suggest that neither the dimensions of valence, arousal, and dominance nor the basic emotions of happiness, fear, anger, disgust, and sadness could be used to accurately describe responses to sexual stimuli. The inclusion of separate sexual ratings with the basic emotion ratings successfully described the response to sexual words, suggesting that the emotional component of the sexual response may be specific to sex. That is, ratings of sexual arousal and sexual energy were the only positive predictors of the sexual word category, while basic emotion ratings accounted for the remaining three emotional word categories, leaving little unique variance explained by emotional dimensions of valence and arousal. These findings support a basic emotion perspective with the inclusion of a sex-specific basic emotion. In addition, the study provided a novel stimulus set that will be freely accessible to researchers and that has been characterized according to both basic and dimensional theories of emotion as well as according to sex-specific emotional measures.

Sexual Emotions in Theories of Emotion

The inclusion of a sexual emotion as a basic emotion is supported by the finding within the sexual word category that the ratings on sexual emotion scales were the only positive predictors of affiliation with the category and (non-sexual) basic emotions (with the exception of sadness) were all significant *negative* predictors of affiliation within the sexual word category (as identified by factor analysis of participant's subjective emotion ratings on scales reflecting dimensional and basic emotions, as well as sexual emotions). Also, dimensional ratings did not predict affiliation with the sexual word category. That is to say, this category of words can be described as highly sexual, as demonstrated by the strong associations with sexual arousal and sexual energy ratings, yet not predicted by non-sexual dimensional emotions, and negatively predicted by basic-emotion ratings. The opposite was found within the three non-sexual word categories identified by the factor analysis, which were characterized by high ratings of single basic emotions or combinations thereof, yet were either not predicted by or were negatively predicted by the sexual ratings.

The theory of basic emotions asserts that more complex emotions consist of combinations of basic emotions. As such, if an emotion related to the sexual response was such a complex emotion (and thus not a basic emotion itself), the sexual word category would be positively predicted by some combi-

nation of basic emotions, which was not the case. It is particularly noteworthy that the only positive basic emotion, happiness, was not a positive predictor of the sexual word category (and was, in fact, a negative predictor as were the four negative basic emotions). That is, the higher the happiness rating of a word, the less likely it was to be in the sexual word category. This dissociation suggests that sexual words are not merely a subcategory of happiness, but are indeed independent. While the finding within the sexual word category provided evidence that sexual ratings may be independent of other, non-sexual emotion ratings, they also suggest that sexual emotions fit well within the general framework of basic emotions. A number of characteristics in addition to subjective experience have been used to define and distinguish among basic emotions, including specific antecedent events and a possibly distinctive physiology (Ekman, 1999). The sexual response has all of these characteristics, including a recently reported specific neurophysiological response pattern as revealed through brain activation patterns to sexual, relative to non-sexual, emotional stimuli (Arnow et al., 2002; Karama et al., 2002; Kim et al., 2006; Park et al., 2001; Stark et al., 2005; Stoleru et al., 1999; Walter et al., 2008).

Our data add to the characteristics describing the emotional component of the sexual response that would label a sexual emotion as basic, as we provided evidence that the subjective reports of sexual emotions were dissociable from other basic emotions. While these findings suggest that a sex-specific emotion may fit within a basic emotion framework, basic emotions may be characterized by distinct patterns of brain activation (Adolphs, 2002; Phan, Wager, Taylor, & Liberzon, 2002) and expression (Darwin, 1872; Dolan & Morris, 2000), in addition to differences in subjective ratings (Mikels et al., 2005; Stevenson & James, 2008; Stevenson et al., 2007). Many distinct patterns of responses are also seen with emotions related to the sexual response (Janssen et al., 2007; Stark et al., 2005; van Lankveld & Smulders, 2008; Walter et al., 2008), but to fully integrate a sex-specific emotion into theories of basic emotions, further studies are needed that directly compare response patterns associated with other basic emotions to those that have been associated with sexually specific emotional responses.

In contrast to the basic emotions, we found little support for the predictive value of a dimensional approach to the classification of sexual and non-sexual emotions. In fact, only the dimensional scale of dominance positively predicted association with any word category. Valence, on the other hand, had no significant influence on any category in either a positive or negative direction, and arousal had a negative impact on the happy category only. This lack of support for a dimensional approach is reflected by the finding that the combination of basic sexual and non-sexual emotions accounted for the largest amount of the variance within all 11 scales. While the four factors did not explain 8.5% of the variance within ratings, and while it is possible that valence and arousal could have accounted for a

portion of this 8.5%, such a small contribution brings into question whether these constructs, when directly compared with a basic emotion approach, are the most valuable way of describing an emotional space or system. It should also be noted that our construction of the sexual scales purposefully mimicked that of the dimensional theories, using a valence and arousal component, which in many ways would bias our results towards finding a pattern of sexual emotions that mimicked the dimensional theories. This was, however, not the case and, despite this bias, we found no evidence that emotions related to the sexual response fit into an emotional space as defined by dimensional theories of emotion.

The findings regarding the lack of influence of valence ratings were intriguing. While there have been claims that emotions related to the sexual response are merely a case of highly-arousing, positive stimuli (Carretie et al., 2003; Rowland et al., 1996), sexual stimuli have also been described as having the potential to co-activate both negative and positive responses (Peterson & Janssen, 2007). This possibility of co-activation has been used to argue that sexual emotions do not fit well into the concept of a basic emotion, as a basic emotion should have either negative or positive valence. However, several basic-emotion theories allow for the co-activation of multiple emotions, even when they have different valences. This can be seen in previous studies of emotional words in which words were rated highly for both fear and happiness, (e.g., the words “ski jump” and “rollercoaster”) (Stevenson et al., 2007). Thus, it is possible that sexual arousal is activated (with possibly an inherently positive valence) in the presence of other, positive or negative, non-sexual emotions. Indeed, the co-activation of positive and negative valence is mostly an issue from a dimensional, not a basic, emotion perspective (although some dimensional models now utilize two unipolar systems that do allow for co-activation (Watson et al., 1999)). Additionally, our data suggest that valence itself did not account for a significant amount of the variance within these emotional ratings, supporting the theory of basic emotions. Our finding that a bipolar valence scale was not a good descriptor of emotional ratings corroborates recent findings that positive and negative emotions are not mutually exclusive (Larsen et al., 2001; Schimmack, 2005; Scollon et al., 2005). Thus, with valence set aside, the co-activating potential of sexual stimuli is not necessarily incompatible with our classification of sex-specific emotions as basic rather than dimensional in that the sexual-energy/sexual-arousal component may capture a co-valent emotional response.

It is interesting to note that, of the three scales used to explore the characteristics of a sexual emotion, the sexual energy scale was the most influential. Sexual energy and sexual arousal ratings showed identical patterns, but, for all four word categories, the influence of sexual energy ratings was greater than that of the sexual arousal ratings. Again, the inclusion of sexual energy was an attempt to ensure that the term “sexual arousal” did not carry a positive emotional connotation (which can be seen in

valence ratings for the words “aroused” and “arousing” of 7.7 and 7.2, respectively). The fact that similar results were found for the two scales, however, underscores the idea that sexual arousal and sexual energy are measuring related constructs, if not the same construct. Additionally, and in line with our previous comments about general valence, ratings of sexual valence had no impact on any of the word categories. In fact, when predicting affiliation with sexual word category, sexual energy was a strong positive predictor, while sexual valence, (non-sexual) valence, and arousal were not predictive, and happiness (a positive basic emotion) was negatively predictive. This dissociation between a sexual emotion and valence, and in particular between sexual energy and happiness strengthens the idea that sexual stimuli do not merely induce a positive and highly-arousing response, but evoke a sex-specific, valence-independent response. Indeed, the finding that the sexual-emotion ratings were negatively predicted by what are considered to be both positive and negative emotions raises further doubt about the ability of valence to describe emotions related to the sexual response.

The Indiana Sexual and Affective Word Set

The present study provides a freely-accessible stimulus set that is well characterized according to the basic emotions of happiness, anger, sadness, fear, and disgust, as well as the dimensional constructs of valence, arousal, and dominance. While stimulus sets characterized according to both of these theoretical approaches are few and far between (Mikels et al., 2005; Stevenson & James, 2008; Stevenson et al., 2007), the current database provides descriptions of each stimulus according to both theories of emotion as well as ratings on scales of sexual valence, sexual arousal, and sexual energy.

The use of a stimulus set such as the ISAWS will be particularly useful in the design of control conditions when investigating the emotional component of the sexual response (e.g., in brain-imaging studies). A number of different types of control conditions have been used in the past, most commonly non-emotional conditions, such as viewing a neutral film (Karama et al., 2002; Park et al., 2001; Stoleru et al., 1999) or non-sexual positive conditions, such as sports highlights (Arnow et al., 2002; Kim et al., 2006) or humor (Stoleru et al., 1999). While such control conditions are useful, they are limited in that they do not allow for tests to examine the specificity of sexual responses or for the exploration of how they compare to other emotions. Although some recent studies have included stimuli relevant to other basic emotions (Stark et al., 2005), the lack of well-normalized stimuli has limited the use of such controls. The ISAWS provides such a set of stimuli, and additionally provides separate ratings for men and women, as well as word-recognition rates, allowing for a higher level of experimental control. The use of word stimuli has been shown to induce sim-

ilar brain responses as observed in response to pictures in emotionally-responsive regions, such as the amygdala and both the ventromedial and dorsolateral prefrontal cortex (Kensinger and Schacter, 2006). Therefore, word stimuli offer an alternative to more commonly used visual sexual stimuli, particularly allowing for the control of contextual details and circumventing the inability to control for participant’s attention and gaze patterns during viewing of the stimuli (Israel & Strassberg, 2009; Rupp & Wallen, 2007, 2008, 2009). The ISAWS provides a wide range of words, including diverse categories that may appeal to both men and women with diverse stimulus preferences.

The potential uses of the ISAWS are dependent on the replication of our findings. Additionally, our findings may be limited in their application to the population used in this study, which consisted primarily of college students, and future studies could explore the associations between responses to the ISAWS and sexual experiences and behaviors in different groups of men and women. Also, as with all emotional stimuli, the exact relationship between the reaction to an emotional stimulus (such as a sexual word), and the experience of that emotion in general (such as sexual arousal), is not clear. The nature of this relationship in this study, as with other studies utilizing emotional stimuli, warrants further investigation.

Finally, we found that the ratings on dimensional and basic emotions were stable across experiments. That is, 135 of our words were derived from Bradley and Lang’s (1999a) ANEW word set, and have previously been rated according to the dimensional scales of valence, arousal, and dominance, as well as according to the basic-emotion categories of happiness, anger, sadness, fear, and disgust (Stevenson et al., 2007). Ratings according to both theoretical approaches were reliably reproduced here. In sum, we hope that the ISAWS will provide a means for researchers investigating the emotional component of the sexual response to better control both the sexual as well as control stimuli used.

Conclusion

The results of this study provide support for the idea that neither the commonly recognized basic emotions of happiness, sadness, fear, anger, and disgust, nor any combination of the five, accurately describe responses to sexual stimuli. As such, the incorporation of sex-specific emotions into theories of basic emotions seems justified and appears to provide, compared to dimensional approaches, a more complete characterization of the emotional components of responses to sexual stimuli. Furthermore, we have created a publically accessible stimulus set, the ISAWS, which will provide a means to control for basic, dimensional, and sexual emotional responses to experimental stimuli.

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Appendix

This appendix accompanies the Indiana Sexual and Affective Word Set (ISAWS), a set of 1450 English words. Example data included are ratings on five basic emotion scales, three emotional dimension scales, and three sexual emotion scales. Basic emotions include happiness, anger, sadness, fear, and disgust (as used in Mikels et al., 2005; Stevenson & James, 2008; Stevenson et al., 2007), emotional dimensions include valence, arousal, and dominance (as used in Bradley & Lang, 1999a, 1999b; Lang et al., 2005), and sexual emotions include sexual valence, sexual arousal, and sexual energy. Ratings were collected on 1099 students from Indiana University (516 female, 583 male, M age = 20 years). Full accounts of ratings for all 1450 words on each rating scale are available upon request from the authors in document or spreadsheet format.

Rating Scales

Rating scales for the five basic emotions of happiness, anger, sadness, fear, and disgust, emotional dimensions of arousal and dominance, and sexual-emotion dimensions of sexual arousal and sexual energy were unipolar scales from 1 (not at all...) to 9 (extremely...). Rating scales for the emotional dimension of valence and sexual-emotion dimension of sexual valence were bipolar scales ranging from 1 (extremely negative or extremely sexually negative) to 9 (extremely positive or extremely sexually positive), centered around 5 (neutral or sexually neutral). In the case that a participant did not know the word, a rating of 0 was given, and the rating was not used in mean, SD , or sex-difference calculations.

Recognition Rates

Recognition rates were calculated for each word based on the number of participants that rated the word 1-9 relative to the number of participants that rated the word 0, indicating they did not know that word. All N s reported, as well as means, standard deviations, and sex differences, are based on the number of ratings from 1 to 9. That is, a rating of 0 by a participant was not taken into consideration for any statistic except for recognition rate.

Sex Differences

Sex differences were calculated by running a simple t -test on the raw ratings from males versus those from females. T -scores for each word are presented in the tables with all participants included. Sex-difference t -scores are reported using male-female means, and as such, a positive t -score indicates a higher rating by males, and a negative t -score indicates a higher rating by females. Using the sex-specific means, SD s, and number of ratings per sex, experimenters can calculate any level of sex difference desired for a given experimental usage of the words. This allows researchers to choose words that do not contain significant sex differences at a level of the experimenter's choosing.

Table Organization

Examples of nine tables can be found below, with all tables found in online supplemental materials in both text and Microsoft Excel formats. These nine tables contain information on each word in the ISAWS, separated by sex (female, male, and both) and separated by emotional theory (basic, dimensional, and sexual). Words are organized according to their ISAWS number, which cluster words into semantically similar groups (i.e. words 2000–2015 are all names for male genitalia).

Appendix Table 1: Table 1 includes ratings on individual words from all subjects on the basic emotion scales. Columns include the word rated, the ISAWS number, and the recognition rate of the word. Means, SD s, and sex difference t -scores are provided for happiness, fear, anger, disgust, and sadness. A range of N s has been provided (individual N s for each basic emotion were omitted due to lack of space, but are included in the Excel sheets available in conjunction with this technical report).

Appendix Table 2: Table 2 includes ratings on individual words from *only female* subjects on the basic emotion scales. Columns include the word rated, the ISAWS number, word length, and the recognition rate of the word by females. Means, SD s, and N s are provided for happiness, fear, anger, disgust, and sadness.

Appendix Table 3: Table 3 includes ratings on individual words from *only male* subjects on the basic emotion scales. Columns include the word rated, the ISAWS number, word length, and the recognition rate of the word by males. Means, SD s, and N s are provided for happiness, fear, anger, disgust, and sadness.

Appendix Table 4: Table 4 includes ratings on individual words from all subjects on the emotion dimension scales. Columns include the word rated, the ISAWS number, word length, and the recognition rate of the word. Means, SD s, N s, and sex difference t -scores are provided for valence, arousal, and dominance.

Appendix Table 5: Table 5 includes ratings on individual words from *only female* subjects on the emotion dimension scales. Columns include the word rated, the ISAWS number, word length, and the recognition rate of the word. Means, SDs, and Ns are provided for valence, arousal, and dominance.

Appendix Table 6: Table 6 includes ratings on individual words from *only male* subjects on the emotion dimension scales. Columns include the word rated, the ISAWS number, word length, and the recognition rate of the word. Means, SDs, and Ns are provided for valence, arousal, and dominance.

Appendix Table 7: Table 7 includes ratings on individual words from all subjects on the sexual-emotion dimension scales. Columns include the word rated, the ISAWS number, word length, and the recognition rate of the word. Means, SDs,

Ns, and sex difference *t*-scores are provided for sexual valence, sexual arousal, and sexual energy.

Appendix Table 8: Table 8 includes ratings on individual words from *only female* subjects on the sexual-emotion dimension scales. Columns include the word rated, the ISAWS number, word length, and the recognition rate of the word. Means, SDs, and Ns are provided for sexual valence, sexual arousal, and sexual energy.

Appendix Table 9: Table 9 includes ratings on individual words from *only male* subjects on the sexual-emotion dimension scales. Columns include the word rated, the ISAWS number, word length, and the recognition rate of the word. Means, SDs, and Ns are provided for sexual valence, sexual arousal, and sexual energy.

Appendix Table 1 All subjects

Word	ISAWS number	Recogn. rate	Happiness			Fear			Anger			Disgust			Sadness			Range N
			M	SD	Sex Diff	M	SD	Sex Diff	M	SD	Sex Diff	M	SD	Sex Diff	M	SD	Sex Diff	
Cock ring	1636	0.95	3.02	2.61	-1.69	2.95	2.58	0.93	2.98	2.79	1.56	3.72	3.01	-2.50	2.43	2.43	2.75	61-66
Ben wa balls	1637	0.49	2.50	2.55	3.76	2.85	2.62	0.76	2.77	2.63	-1.11	3.33	2.70	0.76	2.66	2.26	-1.32	30-39
Vaginal plug	1638	0.91	1.95	1.78	4.39	3.00	2.52	-4.10	3.20	2.72	-0.08	4.90	2.96	-1.43	2.98	2.64	1.54	63-69
Aphrodisiac	1660	0.82	4.82	2.97	0.67	2.00	1.93	1.12	1.85	1.91	2.90	1.68	1.74	1.62	1.84	1.83	2.37	53-61
Wine	1661	0.97	4.13	2.91	-3.05	1.31	0.88	-0.33	1.70	1.63	1.97	1.64	1.45	1.32	1.71	1.53	1.12	62-66
Liquor	1662	0.99	4.94	2.92	-0.36	1.93	1.69	1.10	2.45	2.32	1.80	1.58	1.47	1.48	1.60	1.30	0.23	63-67
Beer	1663	0.98	4.53	3.23	1.50	1.88	1.82	-0.55	1.72	1.63	0.05	2.38	2.42	-1.93	1.87	2.11	0.68	61-70
Chocolate	1664	0.99	4.89	3.25	-2.56	1.49	1.38	0.30	1.49	1.52	0.87	1.33	0.97	2.96	1.48	1.53	0.99	63-69
Alcohol	1665	0.98	4.63	2.81	0.12	2.25	2.05	-1.51	2.15	2.11	-0.85	2.00	1.78	0.00	2.27	2.10	-1.92	63-66
Spanish fly	1666	0.70	2.43	2.61	2.97	1.79	1.84	-0.97	2.24	2.29	0.29	2.91	2.72	-0.45	1.77	1.85	-0.16	42-54
Poppers	1667	0.80	2.95	2.70	2.74	1.86	1.55	-1.16	2.45	2.18	0.19	2.95	2.45	-0.66	2.11	1.94	1.59	42-62
Bed	1700	0.99	5.24	3.23	-2.25	1.55	1.43	2.20	1.52	1.47	1.18	1.40	1.25	1.59	1.70	1.91	0.47	62-69
Penis	2000	0.99	3.60	3.00	-1.98	1.70	1.35	-1.67	1.75	1.42	-2.11	2.40	2.14	-2.25	1.51	1.40	-0.40	67-77
Wiener	2001	0.96	3.25	2.61	-0.84	1.62	1.58	2.97	2.31	2.37	1.02	2.50	2.17	-1.45	1.97	1.94	1.50	60-65
Cock	2002	0.97	2.79	2.19	-4.76	1.81	1.52	2.17	3.22	2.95	0.06	2.60	2.16	-0.66	2.17	2.25	0.20	60-68
Dick	2003	0.98	2.92	2.51	-1.89	1.97	1.95	1.03	2.62	2.24	0.23	2.78	2.36	-0.22	2.11	1.96	0.98	65-71
Peter	2004	0.94	2.37	2.31	2.59	1.94	2.08	2.18	1.31	1.26	1.83	1.54	1.35	0.74	1.60	1.36	0.36	61-65
Pecker	2005	0.97	2.89	2.29	2.01	2.12	2.03	1.02	2.43	2.22	0.23	2.42	2.21	-3.00	1.89	1.86	2.01	61-67
Prick	2006	0.96	1.77	1.65	1.61	2.68	2.20	-1.95	4.55	3.16	-2.00	3.12	2.78	-2.73	2.80	2.20	-0.59	62-69
Shaft	2007	0.98	2.52	2.18	0.28	2.00	1.99	1.60	1.84	1.55	0.78	2.65	2.18	0.77	2.28	2.30	0.54	64-68
Tool	2008	0.98	1.88	1.68	-0.35	2.31	2.16	2.20	3.51	2.85	-0.73	2.89	2.78	0.86	2.37	2.26	3.04	66-71
Ding dong	2009	0.96	3.25	2.44	-0.14	1.97	1.94	1.68	1.80	1.84	3.29	2.03	1.97	-3.00	1.51	1.41	1.53	61-64
Wee wee	2010	0.99	3.59	2.73	-0.18	1.55	1.53	1.84	2.01	2.01	2.01	2.45	2.12	-0.90	1.80	1.64	2.87	67-74
Pee pee	2011	0.98	2.60	2.18	2.07	1.72	1.30	-0.20	1.99	2.15	1.94	3.09	2.20	1.41	1.54	1.35	1.85	64-73
Ding-a-ling	2012	0.95	3.34	2.69	1.84	1.75	1.83	-0.17	1.75	1.87	0.41	3.30	2.65	-0.43	2.27	2.29	-0.74	63-69
Member	2013	0.98	2.88	2.51	-0.97	1.68	1.62	2.65	1.73	1.72	3.32	2.09	2.24	-3.45	1.58	1.66	0.97	62-68
Middle leg	2014	0.92	2.89	2.38	-0.07	2.32	2.19	1.48	1.57	1.32	0.21	3.18	2.32	-2.84	2.16	2.34	-0.66	61-63
Third leg	2015	0.95	2.98	2.60	1.40	2.15	2.29	-1.75	1.52	1.23	-1.29	3.00	2.59	-1.41	2.70	2.65	-0.75	61-65
Hard on	2030	0.98	4.13	3.02	2.29	1.59	1.69	1.32	1.92	1.68	0.74	2.19	1.87	0.27	1.51	1.06	0.08	62-68
Woody	2031	0.96	4.17	2.60	0.62	1.40	1.03	1.93	2.22	2.18	1.17	2.53	2.11	-0.08	1.76	1.73	1.70	62-68

Appendix Table 1 continued

Word	ISAWS number	Recogn. rate	Happiness			Fear			Anger			Disgust			Sadness			Range N
			M	SD	Sex Diff	M	SD	Sex Diff	M	SD	Sex Diff	M	SD	Sex Diff	M	SD	Sex Diff	
Boner	2032	0.97	4.50	2.90	-0.73	1.75	1.32	-1.18	1.57	1.44	-0.84	2.56	2.18	-0.82	2.03	1.98	2.55	65–69
Hard	2033	0.98	3.11	2.55	-2.11	1.83	1.89	1.64	2.55	2.30	1.52	2.09	2.18	1.42	1.48	1.13	0.08	61–67
Well hung	2034	0.98	4.54	2.87	-1.06	2.13	2.12	-0.72	1.85	1.72	1.48	2.27	1.89	0.86	1.58	1.75	1.15	65–68
Corona	2035	0.88	4.31	3.28	1.13	1.89	1.78	-0.60	1.57	1.51	0.96	1.66	1.66	1.29	1.57	1.65	1.92	53–62
Tumescence	2036	0.44	3.04	2.86	1.10	2.47	2.34	-2.07	1.78	1.81	-1.74	2.49	2.29	1.62	2.00	2.00	0.49	26–41
Stiff	2037	0.98	2.44	2.49	1.86	1.87	1.53	1.74	2.22	1.86	0.67	1.97	1.71	1.03	2.04	1.89	0.81	64–69
Stiffy	2038	0.92	2.73	2.59	2.79	2.03	2.03	3.21	2.06	2.13	-0.16	2.98	2.78	-0.87	1.48	1.20	0.82	58–66
Engorgement	2039	0.79	2.79	2.40	4.76	2.70	2.22	-2.24	2.72	2.48	1.07	3.13	2.48	1.31	2.09	2.21	2.40	50–58
Engorge	2040	0.84	2.55	2.34	-0.53	2.24	2.06	-1.06	1.98	1.94	1.51	3.02	2.56	-0.94	2.27	1.99	1.97	49–64

Appendix Table 2 Female subjects

Word	ISAWS number	Word recogn. rate	Happiness			Fear			Anger			Disgust			Sadness			N
			M	SD	Sex Diff	M	SD	Sex Diff	M	SD	Sex Diff	M	SD	Sex Diff	M	SD	Sex Diff	
Snatch	2212	6	0.89	1.31	0.84	26	2.79	2.47	33	2.86	2.28	29	3.11	2.64	28	2.23	2.03	31
Box	2213	3	0.95	1.79	1.71	33	1.23	1.09	31	1.67	1.55	33	1.50	0.97	30	1.90	2.06	31
Poontang	2214	8	0.75	1.64	1.19	25	2.00	1.66	22	3.16	2.15	25	4.43	2.85	30	1.76	1.64	25
Pink taco	2215	9	0.81	2.83	2.50	23	2.80	2.44	30	2.26	1.89	27	6.31	3.01	29	3.00	2.82	29
Quim	2216	4	0.38	1.14	0.38	7	1.55	1.29	11	1.79	1.77	24	2.65	2.03	17	1.44	1.15	18
Clitoral hood	2217	13	0.84	2.34	2.32	29	2.16	1.86	31	1.63	1.22	30	3.16	2.79	25	1.68	1.76	31
Fallopian tubes	2230	15	0.95	2.06	1.85	32	1.66	1.18	32	1.27	0.83	30	1.97	1.78	34	1.38	0.78	34
Hymen	2231	5	0.79	1.50	1.11	30	2.55	2.05	31	1.93	2.15	27	2.84	1.95	31	2.24	1.83	25
Ovaries	2232	7	0.97	2.33	1.76	33	1.61	1.52	31	1.67	1.57	33	1.66	1.18	32	1.19	0.75	31
Ovum	2233	4	0.77	1.84	1.77	31	1.52	1.12	29	1.50	1.53	28	2.48	1.81	25	1.63	2.00	24
Vas deferens	2234	12	0.64	1.82	1.81	28	2.12	2.55	17	1.17	0.38	18	2.21	1.96	19	1.58	1.47	19
Pudendum	2235	8	0.36	1.09	0.30	11	1.69	1.40	16	1.60	1.35	10	1.77	1.96	13	1.64	1.03	11
Perineum	2236	8	0.53	1.71	1.30	24	2.81	2.54	16	1.78	1.48	18	1.82	2.40	11	1.45	1.79	20
Vaginal canal	2237	13	0.94	1.48	1.20	33	2.06	2.00	32	1.84	2.03	32	3.53	2.83	32	1.83	1.85	35
Vaginal	2238	7	0.98	2.45	2.25	33	1.47	0.98	32	1.71	1.49	34	2.71	2.46	34	1.44	1.52	34
Uterus	2239	6	0.98	2.00	1.92	33	2.29	2.34	31	1.67	1.59	33	1.81	1.62	32	2.06	2.03	31
Vulva	2240	5	0.84	2.27	2.26	30	1.90	1.54	30	1.53	1.48	30	1.90	1.63	30	1.67	1.45	30
Clitoris	2241	8	0.96	3.73	3.20	33	1.39	1.15	36	1.62	1.50	34	2.16	1.75	31	1.47	1.48	34
Clit	2242	4	0.95	4.03	2.76	32	2.39	2.38	31	2.59	2.38	34	2.69	2.34	36	1.91	1.80	35
g-spot	2243	6	0.97	5.94	3.21	32	1.16	0.72	32	1.73	1.70	30	1.60	1.56	35	1.19	0.74	32
Vaginal lubrication	2244	19	0.97	2.60	2.26	35	1.72	1.59	32	1.31	0.78	32	3.24	2.74	34	1.39	1.06	33
Cervix	2245	7	0.94	2.06	1.75	31	1.91	1.73	32	2.09	2.04	33	2.03	1.80	29	1.43	1.22	30
Estrogen	2246	9	0.95	3.09	2.35	34	1.68	1.79	34	1.84	1.71	31	1.24	0.65	34	1.51	1.17	35
Progesterone	2247	13	0.66	1.68	1.77	25	1.88	2.05	26	2.30	2.25	20	1.79	1.44	24	2.00	2.30	18
Pussy juice	2248	11	0.97	2.19	2.10	32	2.18	2.24	33	2.29	2.15	34	5.62	3.19	34	3.16	2.89	32
Mammary gland	2249	13	0.86	1.76	1.68	29	1.54	1.07	28	1.43	1.07	30	2.17	2.02	30	1.59	1.12	27
Grafenberg spot	2250	15	0.52	3.91	3.48	11	1.95	1.78	19	1.87	1.79	23	2.13	2.50	15	2.00	2.11	28
Womb	2251	4	0.96	3.46	2.59	37	1.48	1.23	33	1.92	2.08	36	2.18	2.19	34	1.71	1.42	31
Mons pubis	2252	10	0.58	2.32	2.32	22	1.60	1.59	15	1.94	1.95	16	2.93	2.31	15	1.63	1.67	30

Appendix Table 2 continued

Word	ISAWS number	Word recogn. rate	Happiness			Fear			Anger			Disgust			Sadness			N
			M	SD	Sex Diff	M	SD	Sex Diff	M	SD	Sex Diff	M	SD	Sex Diff	M	SD	Sex Diff	
Mons veneris	2253	12	0.39	1.71	1.25	7	3.09	2.07	11	1.62	1.24	21	2.79	2.36	14	1.45	0.93	11
Oxytocin	2254	9	0.57	1.96	1.72	27	2.00	2.09	18	1.92	2.00	26	1.55	0.94	20	2.15	2.30	13
Pheromone	2256	10	0.65	2.43	1.91	28	1.86	1.98	28	1.94	1.89	18	1.32	0.84	22	1.68	1.59	28
Eggs	2257	4	0.96	2.33	2.29	27	1.37	0.97	27	1.60	1.19	30	2.30	2.38	30	1.42	0.90	26
Labia	2258	5	0.86	2.77	2.30	30	1.60	1.50	30	1.42	1.20	31	2.67	2.55	30	1.43	1.17	30
Endometrium	2260	11	0.56	1.75	1.39	24	1.41	1.06	17	2.05	2.51	19	2.56	2.22	16	1.53	0.96	19
Vaginal secretion	2262	17	0.95	2.23	1.91	31	2.65	2.29	34	1.86	1.78	35	3.27	2.64	33	1.55	1.46	31
Breast	2270	6	0.98	3.16	2.80	32	1.42	1.50	33	1.35	0.95	31	1.44	0.95	32	1.47	1.14	32

Appendix Table 3 Male subjects

Word	ISAWS number	Word recogn. rate	Happiness			Fear			Anger			Disgust			Sadness			N
			M	SD	Sex Diff	M	SD	Sex Diff	M	SD	Sex Diff	M	SD	Sex Diff	M	SD	Sex Diff	
Anus	2360	4	0.45	2.52	2.26	27	2.16	2.30	25	2.08	1.79	26	2.20	1.97	30	3.21	2.73	24
Rectum	2360	6	0.45	2.52	2.26	27	2.16	2.30	25	2.08	1.79	26	2.20	1.97	30	3.21	2.73	24
Sphincter	2362	9	0.89	2.42	2.42	31	2.69	2.18	32	1.43	0.97	30	3.31	2.42	29	1.90	2.02	31
Leather cheerio	2363	15	0.68	2.67	2.69	9	3.17	2.78	29	2.77	2.25	30	2.69	2.62	29	2.40	2.06	25
Balloon knot	2364	12	0.77	2.43	2.49	30	2.13	2.40	31	1.44	1.04	25	2.54	2.37	26	3.73	3.11	26
Thighs	2370	6	0.98	3.56	2.61	34	1.79	2.00	33	2.28	2.59	32	1.83	1.56	30	1.75	1.61	32
Legs	2371	4	0.97	4.40	2.91	30	1.48	1.75	31	1.90	1.81	30	2.20	2.52	30	1.74	2.03	31
Enema	2400	5	0.84	1.87	2.03	30	4.46	3.13	26	3.31	2.63	29	4.39	3.47	31	3.47	2.78	30
Castrate	2420	8	0.95	1.67	2.07	30	4.42	3.66	31	5.57	2.99	30	3.75	3.17	32	5.27	3.28	33
Castration	2421	10	0.96	1.69	1.87	32	6.07	3.60	30	5.30	3.19	30	5.36	3.35	33	4.55	3.59	31
Eunuch	2422	6	0.60	1.88	1.65	17	3.48	3.09	23	2.78	2.39	18	2.92	2.78	25	3.32	2.75	19
Vasectomy	2440	9	0.91	3.00	2.85	28	5.00	3.29	32	3.90	2.86	31	3.58	2.50	33	4.00	2.67	30
Circumcise	2460	10	0.97	2.03	2.32	32	3.43	2.97	35	2.20	2.00	35	2.65	2.45	34	2.13	2.22	31
Circumcision	2461	12	0.99	2.50	2.48	36	3.13	2.59	32	2.69	2.57	32	3.00	2.46	34	2.03	2.01	36
Foreskin	2462	8	0.97	2.00	1.46	30	2.28	2.33	32	2.00	2.11	32	3.26	2.83	31	2.77	2.56	30
Smegma	2463	6	0.56	3.00	2.94	19	2.38	1.94	13	2.88	2.73	25	4.54	3.26	13	1.71	1.35	21
Genital mutilation	2464	18	0.91	1.61	1.98	31	5.17	3.71	30	5.77	3.53	31	6.65	3.07	31	6.42	2.96	31
Uncut	2465	5	0.96	1.88	1.49	34	2.35	1.92	31	2.47	2.46	32	3.63	2.70	32	1.81	1.78	31
Sexual dysfunction	2480	18	0.93	1.42	1.52	31	3.97	3.16	34	3.90	3.22	31	3.36	2.70	33	5.44	3.13	32
Erectile dysfunction	2481	20	0.96	2.13	2.37	32	5.67	3.10	33	4.18	3.17	33	3.50	2.76	30	5.52	3.22	33
Impotence	2482	9	0.91	1.34	0.72	29	4.81	3.12	31	3.83	2.60	30	2.87	2.72	31	4.65	3.23	31
Impotent	2483	8	0.94	1.54	1.52	35	4.31	3.34	32	3.31	2.68	32	2.91	2.69	33	3.63	2.81	32
Sterile	2484	7	0.98	2.44	2.54	34	4.39	3.11	33	2.62	2.28	34	2.66	2.34	32	4.21	3.22	34
ED	2485	2	0.78	2.18	2.50	28	2.67	2.67	30	2.63	2.44	30	3.27	2.75	22	3.03	2.98	29
Sterilization	2486	13	0.97	3.06	2.77	36	3.83	3.29	35	3.00	2.83	31	2.69	2.45	36	3.71	2.88	35
Male sterilization	2487	18	0.97	2.10	2.01	31	5.35	3.04	34	2.77	2.52	35	2.55	1.95	33	4.24	2.93	33
Levitra	2500	7	0.79	2.94	2.82	31	2.80	2.72	30	2.29	2.33	31	2.71	2.46	28	2.61	2.50	28
Viagra	2501	6	0.96	3.18	2.76	28	2.94	2.87	31	2.80	2.30	30	3.06	2.24	31	3.19	2.46	31
Cialis	2502	6	0.75	3.00	2.53	26	2.50	2.24	22	3.33	2.88	30	2.52	2.50	31	3.08	2.65	26
Priapism	2520	8	0.51	2.24	2.02	17	2.47	2.74	19	2.78	2.41	18	2.52	2.42	25	2.33	2.02	12

Appendix Table 3 continued

Word	ISAWS number	Word recogn. rate	Happiness			Fear			Anger			Disgust			Sadness			N
			M	SD	Sex Diff	M	SD	Sex Diff	M	SD	Sex Diff	M	SD	Sex Diff	M	SD	Sex Diff	
Semen	2540	5	0.97	2.70	2.08	33	1.64	1.45	33	1.91	2.10	32	2.81	2.09	32	1.25	0.62	32
Sperm	2541	5	0.99	3.06	2.46	33	2.09	1.81	33	1.65	1.47	31	2.38	2.15	37	1.58	1.38	36
Continence	2560	10	0.67	2.72	2.46	25	2.15	2.27	27	2.36	2.64	28	2.15	2.07	27	2.36	1.65	22
Performance	2561	11	0.98	4.38	3.09	34	3.20	2.83	30	1.70	1.38	33	2.21	2.25	33	1.76	1.74	34
Perform	2562	7	0.96	3.76	2.71	34	2.44	2.36	36	2.00	2.03	32	1.79	1.63	34	1.85	1.89	33

Appendix Table 4 continued

Word	ISAWS number	Word length	Recogn. rate	Valence				Arousal				Dominance			
				M	SD	N	Sex Diff	M	SD	N	Sex Diff	M	SD	N	Sex Diff
Autoimmune deficiency syndrome	3021	30	0.80	2.48	2.05	61	0.45	2.38	2.33	52	-2.57	4.85	3.63	50	-0.62
HIV	3022	3	0.97	2.44	2.46	81	0.90	3.34	3.36	71	-1.18	5.24	3.44	79	-0.42
Human Immunodeficiency virus	3023	28	0.89	1.62	1.80	80	0.21	3.87	3.36	76	-1.84	6.11	3.45	71	0.60
HPV	3024	3	0.93	3.07	2.84	66	1.82	3.37	2.54	67	-1.42	4.85	2.93	65	-0.80
Human papillomavirus	3025	20	0.86	2.17	2.20	64	0.09	3.55	2.89	75	-1.17	4.88	3.22	66	-0.59
Chlamydia	3026	9	0.94	1.88	1.74	77	0.58	3.22	2.69	69	-1.69	5.06	3.40	73	-0.23
Gonorrhea	3027	9	0.98	1.73	1.80	88	0.04	3.60	3.26	72	-0.31	4.00	3.25	91	-1.07
Syphilis	3028	8	0.97	2.27	2.24	72	1.33	3.00	2.91	70	-1.02	5.06	3.43	75	0.54
Herpes	3029	6	0.99	1.74	1.52	92	1.01	2.62	2.37	82	-2.25	5.22	3.57	73	-0.51
Cold sore	3030	9	0.98	2.97	1.77	77	2.87	3.07	2.41	91	-0.31	3.57	2.69	77	-0.60
Genital warts	3031	13	0.98	1.78	1.75	77	-0.56	3.21	2.77	93	-0.34	3.84	3.04	83	-1.18
Crabs	3032	5	0.98	2.03	2.08	75	0.66	2.56	2.34	90	-2.89	4.38	3.05	78	-0.01
Pubic lice	3033	10	0.98	2.29	2.19	72	1.49	2.37	2.44	70	-1.81	3.73	3.15	71	-0.99
The clapper	3034	11	0.80	4.03	2.21	65	1.04	4.00	2.72	61	0.09	4.60	2.99	60	-0.70
Clean	3035	5	0.98	7.13	2.39	86	-1.93	5.92	2.74	82	-0.66	5.74	2.56	79	-0.31
Cytomegalovirus	3036	15	0.44	3.57	2.54	38	1.08	4.29	3.09	17	0.26	3.89	2.85	32	-0.55
CMV	3037	3	0.41	4.58	2.61	16	0.25	2.86	1.99	27	-1.14	3.10	2.64	20	-1.62
Pediculosis pubis	3038	17	0.52	4.23	2.92	24	1.46	3.07	2.30	30	-1.84	5.47	2.03	30	1.81
Pelvic inflammatory disease	3039	26	0.93	2.69	2.09	63	1.69	3.14	2.26	66	-0.61	4.03	2.54	69	-1.14
PID	3040	3	0.46	3.55	2.66	35	0.64	4.42	2.15	32	0.40	4.79	2.64	30	-0.38
Disease	3041	7	0.99	2.03	1.58	73	1.23	3.69	2.67	78	0.04	4.50	3.11	79	0.23
UTI	3060	3	0.73	3.54	2.03	41	2.07	3.56	2.38	40	-0.21	4.65	2.16	50	0.33
Urinary tract infection	3061	23	0.98	1.92	1.68	75	-0.08	3.03	2.11	77	-1.45	3.22	3.02	77	-0.59
Vaginitis	3080	9	0.84	3.52	2.41	61	2.00	3.25	2.27	52	-0.02	5.58	2.99	47	1.67
Vulvodynia	3090	10	0.42	3.88	2.59	23	0.93	4.33	1.32	20	0.93	4.18	2.74	25	0.04
Dyspareunia	3091	11	0.41	3.14	2.18	26	0.28	4.53	2.23	22	0.43	5.00	3.07	21	1.49
Vaginismus	3092	10	0.54	3.89	2.33	37	0.53	3.93	2.15	34	0.17	3.91	2.63	38	-0.16
Slut	3100	4	0.98	3.93	2.56	60	2.45	5.10	3.10	64	1.56	5.27	2.80	62	1.46
Hoochie	3101	7	0.96	4.53	2.27	63	2.84	4.73	2.59	66	1.42	4.42	2.55	66	0.33
Loose	3102	5	0.98	4.03	2.62	71	3.09	4.46	2.32	68	2.22	3.85	2.84	67	0.00
Skank	3103	5	0.99	3.05	2.08	72	1.91	5.21	2.41	69	4.94	5.34	2.68	76	1.49
Sleazy	3104	6	0.97	3.09	2.23	69	1.36	4.23	2.60	63	0.89	4.74	2.24	67	1.29
Easy	3105	4	0.99	4.60	2.65	72	1.59	5.18	2.46	67	1.76	4.67	2.57	66	2.32

Appendix Table 4 continued

Word	ISAWS number	Word length	Recogn. rate	Valence				Arousal				Dominance			
				<i>M</i>	<i>SD</i>	<i>N</i>	Sex Diff	<i>M</i>	<i>SD</i>	<i>N</i>	Sex Diff	<i>M</i>	<i>SD</i>	<i>N</i>	Sex Diff
Dirty	3106	5	0.99	4.24	2.60	74	-0.28	4.76	2.50	67	-0.92	4.90	2.45	76	1.38
Tramp	3107	5	0.98	3.30	2.42	65	1.92	4.41	2.50	71	0.96	4.54	2.37	71	1.06
Make-out slut	3108	13	0.99	5.29	2.77	65	2.45	4.93	2.89	64	-0.01	5.38	2.27	65	1.39

Appendix Table 5 Female subjects

Word	ISAWS number	Word length	Recogn. rate	Valence			Arousal			Dominance		
				<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>
Playboy	3137	7	0.98	4.45	3.03	31	4.57	2.81	30	4.94	2.57	31
Prostitute	3150	10	0.98	2.24	1.68	33	4.06	2.92	35	4.00	2.90	32
Whore	3151	5	0.99	2.16	1.80	32	4.45	2.87	33	5.00	2.94	35
Hooker	3152	6	0.98	2.52	2.26	31	3.76	2.62	34	4.84	2.86	31
Harlot	3153	6	0.61	3.68	2.38	19	4.58	2.52	19	3.83	2.23	18
Hustler	3154	7	0.96	3.97	2.53	33	4.66	2.44	32	4.17	2.38	35
Escort	3155	6	0.97	4.50	2.05	34	4.63	2.83	32	4.56	2.68	34
Call girl	3156	10	0.96	2.85	2.09	33	4.09	2.29	32	3.94	2.42	33
Man eater	3157	9	0.92	4.22	2.81	23	4.33	2.50	30	5.10	2.71	31
Vamp	3158	4	0.72	4.06	2.44	18	3.20	2.14	15	4.04	2.81	24
Nympho	3159	6	0.89	5.44	2.40	32	5.28	3.10	32	6.00	2.73	33
Slag	3160	4	0.60	3.13	2.25	16	3.39	2.50	18	3.40	2.26	20
Lady of the night	3162	17	0.94	4.36	2.89	33	4.57	2.66	35	4.77	2.40	30
Working girl	3163	12	0.96	6.33	2.87	24	4.90	2.63	30	5.61	2.30	31
Sex pot	3164	7	0.89	5.73	2.45	30	6.03	2.65	30	5.66	2.13	32
Turn a trick	3170	12	0.82	3.75	2.53	28	4.63	2.88	30	5.26	2.71	31
Solicitation	3171	12	0.87	2.70	1.86	30	3.59	2.24	32	4.06	2.63	31
Whore house	3190	11	0.97	3.30	2.77	30	4.03	2.80	31	4.37	3.27	30
Tea room	3191	8	0.80	4.97	2.04	30	4.33	2.48	24	3.27	2.39	30
Bath house	3192	10	0.89	4.52	1.97	23	3.13	2.71	30	4.27	2.59	30
Brothel	3193	7	0.81	3.38	2.31	29	2.97	2.03	30	5.48	2.66	23
Buddy booth	3194	11	0.65	2.50	1.89	18	5.22	2.76	18	5.10	2.77	20
Penthouse	3195	9	0.96	4.88	2.61	32	5.72	2.23	32	5.06	2.54	33
Fluffer	3210	7	0.65	4.76	2.39	21	4.12	2.76	17	3.44	2.25	16
Stripper	3230	8	0.98	4.15	2.61	33	5.05	2.84	37	5.43	2.75	35
Exotic dancer	3231	13	0.98	4.60	2.34	30	5.00	2.88	30	4.20	2.66	30
Lap dance	3250	9	0.98	6.06	2.46	31	5.97	2.42	33	6.13	1.91	38
Pole dance	3251	10	0.97	4.67	2.43	33	6.00	2.36	35	5.19	2.78	37
Pasties	3252	7	0.82	4.62	2.06	26	3.57	2.40	30	3.86	2.21	28
Sniffer's row	3253	13	0.46	2.53	2.15	17	3.75	2.18	12	2.71	2.09	14
Glory hole	3254	10	0.76	4.00	2.18	22	4.36	2.66	22	4.70	2.79	23
Porn star	3280	9	0.99	4.13	2.77	38	5.00	2.76	37	4.91	2.72	35
Playmate	3281	8	0.98	5.83	2.29	35	6.06	2.62	35	4.72	2.16	32
Pornography	3300	11	0.97	4.86	2.75	35	5.24	2.47	38	5.06	2.72	35
Pornographic	3301	12	0.98	4.44	2.70	39	4.71	2.80	35	5.23	2.79	35
Porno	3302	5	0.99	4.84	2.79	31	5.87	2.70	31	5.87	2.69	31
Erotica	3303	7	0.93	5.90	2.47	30	6.83	2.35	30	6.70	2.02	27
XXX	3320	3	0.88	4.73	2.79	30	5.69	2.68	32	6.77	2.25	30
X-rated	3321	7	0.98	5.32	2.53	31	6.17	2.55	30	6.73	2.61	30

Appendix Table 6 Male subjects

Word	ISAWS number	Word length	Recogn. rate	Valence			Arousal			Dominance		
				<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>
Adult magazine	3340	14	0.98	6.10	1.94	31	6.23	2.40	30	6.30	2.12	30
Hustler magazine	3341	16	0.97	6.87	2.27	30	6.31	2.39	29	6.70	2.49	30
Playboy magazine	3342	16	0.99	6.06	2.19	33	6.97	1.83	30	6.09	2.42	34
Centerfold	3343	10	0.94	5.78	2.46	32	5.71	2.24	38	5.53	2.44	34
Penthouse magazine	3344	18	0.98	6.77	1.87	30	6.65	2.43	20	6.22	2.22	27
Adult film	3360	10	0.99	6.56	1.97	34	7.06	1.57	31	6.13	2.01	30
Hardcore porn	3361	13	0.98	6.07	2.55	42	6.39	2.39	36	7.12	2.01	33
Softcore porn	3362	13	0.97	5.47	1.96	30	5.74	1.91	31	5.17	2.26	30
Snuff film	3363	10	0.83	4.21	2.76	19	4.82	2.38	17	5.06	2.66	31
Yaoi	3364	4	0.55	3.80	2.60	15	3.00	1.84	11	4.71	2.05	14
Gonzo	3365	5	0.82	4.33	2.50	24	5.17	2.57	30	3.21	2.23	19
Internet pornography	3380	20	0.98	6.62	2.26	26	4.86	2.33	29	4.71	2.48	28
Child pornography	3400	17	0.99	1.69	1.35	32	2.31	2.24	36	4.69	3.22	32
Hentai	3420	6	0.74	4.82	2.15	22	4.12	2.15	17	3.63	2.59	19
Slash fiction	3421	13	0.72	4.15	1.81	20	5.19	2.34	16	4.30	2.81	30
Romance novel	3422	13	0.99	4.57	2.21	30	4.18	2.21	33	3.52	2.41	31
Amyl nitrate	3430	12	0.55	4.50	3.21	10	4.33	2.96	12	3.82	2.58	17
Sexual deviance	3440	15	0.95	4.50	2.35	26	4.63	2.51	30	5.17	2.65	30
Taboo	3441	5	0.94	4.90	2.13	31	4.53	2.40	32	5.09	2.52	33
Bestiality	3450	11	0.95	2.66	2.56	32	3.09	2.69	22	3.77	2.84	30
Zoophilia	3451	9	0.62	2.29	2.37	17	4.06	3.07	17	3.93	2.95	27
Transvestite	3460	12	0.95	2.26	2.34	34	3.79	2.54	34	3.68	2.84	34
Cross dress	3461	11	0.98	2.76	2.19	34	2.89	2.31	36	4.00	3.16	34
Tranny	3462	6	0.92	2.42	1.70	36	3.12	2.74	34	3.50	2.74	30
Coprophilia	3470	11	0.51	5.57	1.99	7	3.88	2.15	17	4.43	2.59	14
Coprophagia	3471	11	0.52	4.33	2.34	6	4.08	2.64	12	3.80	2.35	10
Necrophilia	3480	11	0.79	3.80	2.65	25	3.33	2.69	15	4.48	2.97	25
Voyeur	3490	6	0.85	4.77	2.20	26	4.97	2.25	30	4.64	2.66	25
Upskirt	3491	7	0.96	4.97	2.50	34	6.97	1.85	34	5.67	2.51	36
Fetish	3500	6	0.98	5.21	1.98	33	5.10	2.53	31	5.85	2.29	39
Paraphilia	3501	10	0.62	5.73	1.42	11	3.33	2.38	15	4.20	2.01	15
Foot fetish	3502	11	0.97	4.27	2.24	30	4.38	2.41	34	3.84	2.24	32
Exhibitionism	3510	13	0.84	3.40	2.13	15	5.80	2.04	30	5.05	2.04	20
Flash	3511	5	0.97	5.78	1.97	36	5.71	2.59	34	4.97	1.94	37
Role playing	3520	12	0.99	6.16	2.12	31	5.81	2.30	31	6.19	2.02	31
Sex addict	3530	10	0.98	5.09	2.35	34	6.32	2.67	34	5.42	2.56	36
Sexcapade	3531	9	0.92	6.19	2.21	21	6.45	2.57	31	5.03	2.46	30
Nymphomaniac	3540	12	0.85	4.97	2.63	31	7.07	2.18	28	7.10	1.83	30
Nudism	3550	6	0.96	5.79	2.20	38	6.56	1.88	39	5.42	2.55	33

Appendix Table 7 All subjects

Word	ISAWS number	Word length	Recogn. rate	Sexual valence				Sexual arousal				Sexual energy			
				<i>M</i>	<i>SD</i>	<i>N</i>	Sex Diff	<i>M</i>	<i>SD</i>	<i>N</i>	Sex Diff	<i>M</i>	<i>SD</i>	<i>N</i>	Sex Diff
Dominatrix	3620	10	0.90	4.21	2.69	68	-0.24	3.52	2.52	58	1.42	5.82	3.00	64	1.85
Femdom	3621	6	0.56	4.13	2.20	33	-1.14	1.73	1.39	30	0.35	3.59	2.88	44	0.75
Domme	3622	5	0.61	6.06	2.54	35	2.66	2.84	2.54	38	-2.02	3.58	3.36	36	0.93
Vominatrix	3623	10	0.52	3.25	2.41	37	-0.68	1.32	0.77	28	-0.85	2.67	2.45	41	3.60
Switch	3624	6	0.94	4.68	2.36	57	1.95	2.30	2.09	69	0.67	2.32	1.80	63	3.68
Bondage	3640	7	0.96	4.90	2.66	63	-0.25	2.52	2.16	67	2.76	4.83	3.13	66	1.86
Blindfold	3641	9	0.99	5.58	2.43	68	-1.87	3.94	2.59	65	1.65	4.24	2.67	62	0.14
Handcuffs	3642	9	0.98	5.35	2.18	71	-0.91	3.34	2.68	70	-1.84	5.09	2.40	71	-1.06
Leather	3643	7	0.99	4.80	2.01	68	0.02	3.09	2.76	69	2.92	3.41	2.48	71	0.74
WhiP	3660	4	0.98	4.26	2.55	70	-1.53	2.60	2.18	67	0.11	4.88	2.53	67	-0.40
Cat o' nine tails	3661	17	0.57	3.62	2.60	29	-0.45	2.14	2.24	35	0.73	2.56	2.55	36	0.91
Violet wand	3662	11	0.69	4.14	2.35	26	-0.30	2.32	2.38	41	1.48	3.26	2.47	46	2.64
Leash	3663	5	0.98	3.73	2.16	60	-0.06	2.30	2.26	69	4.81	2.88	2.41	73	0.92
Mask	3664	4	0.95	4.17	2.30	60	0.80	2.05	2.15	63	1.59	2.46	2.06	67	0.98
Gag	3665	3	0.97	4.41	2.87	66	3.46	2.37	2.30	65	4.55	4.12	2.65	71	3.38
Talking dirty	3678	13	0.97	6.55	1.81	77	-1.17	4.97	3.19	62	2.96	6.36	2.13	65	3.55
Scripting	3679	9	0.83	4.96	2.13	52	0.80	2.10	1.95	60	1.31	3.16	2.53	60	2.78
Spanking	3680	8	0.98	5.31	1.85	69	-0.10	4.06	3.00	62	3.22	5.63	2.59	69	1.68
Hit	3681	3	0.98	4.00	2.76	56	0.18	1.77	1.94	66	4.32	2.68	2.51	73	0.48
Smack	3682	5	0.98	5.46	2.27	74	2.02	2.80	2.24	65	0.41	3.39	2.67	64	-0.16
Slap	3683	4	0.98	3.66	2.34	66	0.20	2.42	2.27	67	0.94	2.62	2.28	75	0.64
Cutting	3684	7	0.97	2.70	2.39	62	0.85	2.00	2.20	71	1.90	1.92	1.88	69	0.63
Autoerotic asphyxiation	3690	23	0.63	3.24	2.25	34	-1.07	1.82	1.59	39	0.43	4.27	3.12	44	2.89
Autoerotic strangulation	3691	24	0.68	3.10	2.23	48	1.58	2.47	2.45	47	1.10	3.58	2.64	56	3.74
Bloodsports	3692	11	0.85	2.84	2.55	53	-0.85	1.78	1.99	60	1.19	1.66	1.42	66	1.24
BDSM	3693	4	0.52	3.72	2.24	28	-0.80	2.83	2.57	35	2.21	4.88	2.85	22	3.55
Breath play	3694	11	0.81	5.05	2.30	41	0.68	2.83	2.38	59	2.49	3.77	2.71	60	1.02
Asphyxiophilia	3695	15	0.50	2.64	2.47	27	1.08	1.90	1.97	30	1.24	2.88	2.32	34	3.77
Scarfig	3696	8	0.80	3.63	2.85	35	0.29	1.74	1.44	47	0.04	2.09	1.79	53	2.89
Asphyxiation	3697	12	0.71	3.23	2.14	52	-0.43	1.92	1.89	52	3.16	2.62	2.52	52	1.77
Ballooning	3698	10	0.74	4.27	2.37	28	-0.14	2.07	2.07	55	-1.79	2.86	2.65	51	1.87
Restraints	3699	10	0.96	4.41	2.46	64	-0.59	2.45	2.42	69	-0.73	3.65	2.82	68	0.17
Rape	3700	4	0.98	2.08	2.36	72	1.13	1.67	1.78	63	1.14	4.23	3.05	70	4.37
Sexual assault	3701	14	0.98	2.10	2.47	70	-0.62	1.52	1.52	71	3.24	4.12	3.15	69	2.32
Gang bang	3702	9	0.97	5.71	2.96	65	3.75	2.45	2.40	66	6.78	5.62	2.79	72	5.87
Statutory rape	3703	14	0.97	2.32	2.20	62	0.16	2.03	2.18	63	1.87	4.40	3.02	67	4.73
Date rape	3704	9	0.97	1.84	1.59	66	-0.13	1.59	1.75	66	-0.50	4.28	2.92	67	5.08
GHB	3705	3	0.49	2.58	2.54	28	-0.11	1.91	1.62	34	-0.46	3.14	2.80	29	1.89
Roofies	3706	7	0.94	2.19	1.76	62	-0.27	1.48	1.51	64	0.12	4.08	2.73	62	2.55

Appendix Table 8 Female subjects

Word	ISAWS number	Word length	Recogn. rate	Sexual valence			Sexual arousal			Sexual energy		
				<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>
NAMBLA	3743	6	0.35	2.92	2.29	13	1.50	0.97	10	1.50	0.85	10
Pervert	3760	7	0.99	1.77	1.73	35	1.68	1.89	31	2.87	2.78	39
Victim	3780	6	0.98	2.75	2.33	32	1.48	1.41	31	2.08	2.38	36
Afraid	3781	6	0.99	2.81	2.17	37	1.36	0.93	33	1.77	1.80	26
Sex offender	3800	12	0.98	2.68	2.59	37	1.43	1.43	28	1.97	2.03	30
Sexual predator	3801	15	0.98	2.09	1.97	32	1.18	0.73	33	3.03	2.63	36
Wife beater	3820	11	0.96	1.48	1.15	31	1.85	1.87	33	1.28	0.85	36
Abuse	3821	10	0.99	2.00	2.02	33	1.37	0.94	35	1.47	0.94	36
Abusive	3822	7	0.99	2.71	2.33	34	1.26	1.38	34	1.55	1.90	38
Assault	3823	7	0.96	1.76	1.70	38	1.50	1.48	30	1.85	1.97	33
Verbal abuse	3824	12	0.97	2.62	2.42	34	1.03	0.18	30	1.66	1.72	29
Sexual harassment	3840	17	0.98	2.19	2.11	37	1.28	0.93	40	3.02	2.92	41
Sexual discrimination	3841	21	0.97	2.03	1.59	30	1.45	1.31	31	1.88	1.75	34
Gender differences	3842	18	0.96	5.27	2.32	30	2.03	2.30	31	2.89	2.68	36
Sexual equality	3843	15	0.96	6.84	2.07	31	2.50	2.52	30	3.19	2.73	31
Kama Sutra	3900	10	0.88	7.45	2.11	31	4.97	3.05	30	6.32	3.03	34
Lingam	3901	6	0.36	3.88	2.64	8	2.07	2.06	14	1.67	1.59	15
Yoni	3902	4	0.40	4.45	2.58	11	1.56	1.89	18	1.85	2.30	13
Yin	3910	3	0.56	4.60	2.32	15	1.86	2.21	14	1.24	0.62	21
Yang	3911	4	0.71	5.06	2.35	16	2.00	1.95	30	2.08	2.04	24
Tantric	3950	7	0.76	4.50	2.72	20	4.05	2.90	19	4.84	2.90	25
Tantric sex	3951	11	0.73	5.68	2.63	25	4.56	2.97	25	6.03	2.63	29
Group sex	4000	9	0.97	2.80	2.30	30	2.47	2.43	30	5.47	3.12	36
Orgy	4001	4	0.97	4.07	2.79	42	2.22	2.06	32	5.82	3.13	39
Menage a trios	4002	14	0.75	4.86	2.92	21	3.32	2.30	25	4.92	3.30	24
Threesome	4003	9	0.98	4.56	2.71	32	2.59	2.41	32	5.67	3.04	36
Foursome	4004	8	0.98	3.44	2.85	34	2.33	2.53	36	5.51	3.26	37
Sex	4020	3	0.99	7.65	2.33	34	5.16	3.23	37	7.30	2.46	37
Make love	4021	9	0.99	7.56	2.34	34	6.29	2.59	34	7.16	2.01	37
Sexual relations	4022	16	0.97	6.55	2.31	31	3.79	2.72	29	4.81	2.92	32
Coitus	4023	7	0.49	4.13	2.85	15	2.88	2.45	17	3.20	2.86	20
Intercourse	4024	11	0.98	7.24	2.17	33	4.70	2.80	37	6.74	2.68	34
Fornicate	4025	9	0.87	5.53	2.55	32	1.97	1.64	31	3.70	2.97	27
Fornication	4026	11	0.84	5.16	2.73	31	2.71	2.31	21	3.48	2.95	29
Premarital sex	4027	14	0.99	5.97	2.32	37	3.74	2.99	31	5.66	2.87	32
Vaginal penetration	4028	19	0.96	6.69	2.47	35	3.23	2.47	31	5.52	3.13	33
Screw	4029	5	0.99	5.09	2.60	33	3.59	2.41	34	5.81	2.74	36
Fuck	4030	4	0.99	5.81	2.85	31	4.81	3.04	32	6.56	2.93	39
Rainbow sex	4031	11	0.71	3.21	2.32	19	1.97	1.94	29	3.74	2.94	27

Appendix Table 9 Male subjects

Word	ISAWS number	Word length	Recogn. rate	Sexual valence			Sexual arousal			Sexual energy		
				<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>
Score	4032	5	0.98	5.89	2.38	36	4.33	2.73	33	5.75	2.29	28
Peg	4033	3	0.92	3.48	2.11	29	2.83	2.97	30	2.32	2.27	34
Play	4034	4	0.97	5.62	2.68	29	3.75	2.70	36	4.67	2.43	30
Shag	4035	4	0.97	5.81	2.29	36	3.91	2.74	33	5.58	2.68	33
Bang	4036	4	0.97	7.15	1.89	34	3.68	2.94	34	6.50	2.34	34
Getting laid	4037	12	1.00	7.26	2.28	31	4.76	3.05	34	7.65	1.68	31
Laid	4038	4	0.99	6.60	2.50	40	4.83	2.76	36	6.58	2.33	38
Shack up with	4039	13	0.96	6.31	2.11	26	3.13	2.46	32	5.94	2.44	31
Go all the way	4040	14	0.98	7.44	1.72	32	4.97	2.81	33	6.96	2.29	26
Nookie	4041	6	0.96	5.73	2.60	30	3.86	2.79	35	6.45	2.36	31
Make it	4042	7	0.98	4.64	2.45	33	3.29	2.60	31	3.59	2.61	32
Do it	4043	5	0.97	6.26	2.56	31	4.22	2.64	36	5.82	2.35	34
Sleep around	4044	12	0.98	6.26	2.45	35	2.57	2.39	35	6.31	2.19	32
Nail	4045	4	0.97	5.03	2.15	31	2.79	2.57	33	4.09	2.78	34
Make-up sex	4046	11	0.98	7.79	1.97	34	4.97	3.10	32	7.44	2.05	34
Marital sex	4047	11	0.98	6.51	2.31	35	4.09	2.96	32	6.58	2.24	33
Casual sex	4048	10	0.99	6.83	1.75	36	4.90	2.91	39	7.05	2.38	38
Penetrative intercourse	4049	23	0.93	7.32	1.83	28	4.97	3.13	32	7.64	1.90	33
Sleep with	4050	10	0.97	6.50	1.88	40	4.40	2.68	35	6.32	2.40	34
Sexual positions	4060	16	0.99	7.03	2.48	31	4.53	3.12	32	7.19	1.72	36
Missionary position	4061	19	0.96	6.17	2.29	36	5.60	2.78	35	7.26	2.17	35
Doggy style	4062	11	0.99	7.00	2.18	33	6.85	2.40	34	7.40	2.24	30
Rear-entry intercourse	4063	22	0.97	6.34	2.15	35	3.77	3.05	35	6.87	2.64	31
Eagle wings	4064	11	0.35	3.00	1.86	12	2.89	2.73	19	3.42	2.85	26
Lotus position	4064	14	0.35	3.00	1.86	12	2.89	2.73	19	6.23	2.14	26
Clasping position	4065	17	0.83	5.86	1.66	29	3.47	2.65	30	5.81	2.38	26
Oceanic position	4066	16	0.73	5.48	2.41	23	3.96	2.71	28	5.83	2.79	29
Scissor position	4067	16	0.92	5.19	2.83	31	4.48	3.28	33	7.00	2.37	33
One-night stand	4080	15	0.98	6.30	2.21	43	5.06	2.89	36	6.86	2.51	28
Quickie	4081	7	0.97	7.22	1.88	32	4.55	2.92	33	7.11	1.91	28
Booty call	4082	10	0.98	6.68	1.92	31	4.50	2.99	32	7.29	2.11	28
Fuck buddy	4083	10	0.98	7.30	2.12	30	5.94	2.98	31	7.68	1.97	34
Nooner	4084	6	0.74	4.80	2.51	15	2.69	2.61	29	4.15	2.98	26
Orgasm	4100	6	0.99	7.98	1.90	41	5.90	2.99	31	7.82	1.59	33
Get off	4101	7	0.99	6.28	2.05	36	5.00	3.20	32	6.29	2.26	28
Climax	4102	6	0.98	7.55	2.09	33	4.22	3.33	37	7.56	1.95	32
Multiple orgasms	4103	16	0.97	7.74	2.11	34	6.26	3.14	34	7.91	1.80	34
Cum	4104	3	0.97	6.30	2.29	30	4.39	2.92	31	7.32	2.33	34
Jizz	4105	4	0.97	6.91	2.07	33	2.74	1.98	31	7.24	2.16	34

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