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## Ethnocultural Differences in Motivations for Sex

Arthur Robert Andrews III  
*University of Arkansas, Fayetteville*

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## Ethnocultural Differences in Motivations for Sex

Ethnocultural Differences in Motivations for Sex

A dissertation submitted in partial fulfillment  
of the requirements for the degree of  
Doctor of Philosophy in Psychology

by

Arthur R. Andrews III  
Oklahoma State University  
Bachelor of Arts in Spanish, 2008  
Oklahoma State University  
Bachelor of Science in Psychology, 2008  
University of Arkansas  
Master of Arts in Psychology, 2010

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University of Arkansas

This dissertation is approved for recommendation to the Graduate Council

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Dr. Ana J. Bridges  
Dissertation Director

---

Dr. Ellen W. Leen-Feldner  
Committee Member

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Dr. Jeffrey M. Lohr  
Committee Member

## Abstract

Motivations for sex are numerous and varied (Browning, 2004; Meston & Buss, 2007). Using exploratory factor analytic methods, 21 theoretically distinct motivations have been proposed (Browning, 2004; Meston & Buss, 2007). A comprehensive number of motivations for sex has yet to be examined with confirmatory techniques. Theoretical work related to the treatment of sexual dysfunction has suggested that motivations focused on individual and partner pleasure would positively relate to sexual functioning (e.g., Leiblum & Rosen, 1992). Motivations for sex also appear to vary as a function of ethnocultural factors, as some motivations have only been uncovered utilizing qualitative methods with diverse samples (Browning, 2004) and some ethnic groups appear to differ in the average degree to which they endorse specific motivations (Browning; 2004; Cooper et al., 1998). The current study expanded on previous literature by examining four distinct aims: (1) to confirm a comprehensive number of motivations for sex, (2) to examine ethnic differences in motivations for sex among the four largest ethnic groups in the U.S., (3) to explore clinical correlates of motivations for sex, and (4) to examine ethnic differences in the relations between motivations for sex and clinical correlates. Confirmatory factor analyses largely supported 21 distinct motivations for sex [ $\chi^2(3,794) = 11,208.27, p < .001, CFI = .87, SRMR = .052, RMSEA = .046, 90\% CI = .045-.047, \chi^2/df = 2.95$ ]. Most factors (14) appeared invariant across ethnic groups. Two motivations (Role Fulfillment and Submission) varied in the average degree to which ethnic groups endorsed each motivation. Motivations emphasizing pleasure and partner pleasure positively correlated with sexual functioning. Six motivations varied across ethnic groups in their relations with clinical correlates. Overall, the study supports a comprehensive set of motivations for sex. Further, on average, ethnic groups appear to engage in sex for mostly similar reasons. Correlations between

motivations for sex and clinical correlates largely support proposed mechanisms of sexual dysfunction treatment. These relations, however, appear to vary among ethnic groups, potentially suggesting the importance of relationship context in how motivations for sex relate to clinically-relevant variables.

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I would like to first acknowledge my family members whose support has made this work possible. The encouragement of my parents, Arthur and Raylene, and brothers, Jeremy and Caleb, kept me motivated to pursue any goal I chose. Lessons of tolerance and acceptance offered by my grandmother, Sarah, directly led me to this career. Through her, I learned my passion to serve and care for others regardless of their background. I would also like to acknowledge my labmates and collaborators who have helped me to this point in my career. Lastly, I would like to thank my advisor, mentor, and friend, Dr. Ana Bridges. She has provided a model of integrity and success truly worthy of emulation. I cannot imagine that I could have completed these tasks without her.

## **Dedication**

This dissertation is dedicated to my wife, Caitlyn. She has been my best friend and supporter throughout my graduate training. She encouraged me to keep going when motivation was lacking. I can never repay her for everything she has done for me.

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Outside of eating, sexual behavior may be the most ubiquitously exhibited behavior among all animals. Survival of an animal species relies as much on sexual behavior as any other. Yet, sexual behavior extends beyond purely reproductive purposes, especially among humans. The advent and proliferation of oral contraceptives within the U.S. and many other Western societies may provide one of the best examples of how the role of sex has far outgrown its evolutionary import. As of 2002, the majority (58.5%) of women between the ages of 18 and 24 – one of the reproductively least risky periods in a woman's life – took contraceptive medication regularly (Centers for Disease Control). The majority of these women also engage in sex regularly. Thus, the group of women most likely to have biologically successful offspring is explicitly attempting to avoid the possibility of sex resulting in pregnancy. This evidence seems to point to a diminished reproductive importance of sex; sexual behavior still remains important to individuals and societies in other ways. For example, low sexual satisfaction has frequently been linked to depressive symptoms (e.g., Nicolosi, Moreria, Villa, & Glasser, 2004), low self-esteem (Althof et al., 2002), and negative romantic relationship outcomes, such as low relationship satisfaction, increased sexual infidelity, and even relationship termination (e.g., Buss & Shackelford, 1997).

Adding to the body of research suggesting that sex is influenced by and influences more than just reproduction, sexual behavior appears to vary between cultures and from person to person. For example, in the U.S. sexual behavior varies between ethnic groups (Meston, Trapnell, & Gorzalka, 1996; Quadagno, Sly, Harrison, Eberstein, & Soler, 1998; Upchurch, Levy-Storms, Sucoff, & Aneshensel, 1998). In a comparison of Latina women, African American women, and Caucasian women living in the U.S., Latinas reported engaging in penetrative anal sex more often than the other two ethnic groups (Quadagno et al., 1998). Latinas and Caucasian women reported engaging in more oral sex than did African American

women. These differences in sexual behavior extend to larger differences between countries. Rates of erectile dysfunction, for instance, vary widely between countries (e.g., Nicolosi, Laumann, Glasser, et al., 2004). These differences may be quite large; one study suggested rates of erectile dysfunction in the U.S. are double the rates of dysfunction in multiple other countries (e.g., Nicolosi, Moreria, Villa et al., 2004). Moreover, in countries with fewer economic and social freedoms for women, both men and women tend to have fewer sexual partners than in countries with greater gender equality (Baumeister & Mendoza, 2011). Sexual behavior in this case not only varies between countries, but also as a function of culture. Similarly, in a cross-national study comparing Costa Rican and U.S. college students, Costa Ricans reported fewer sexual intercourse partners than people living in the U.S. (Rodríguez-Arauz, Mealy, Smith, & DePlacido, 2013). The same pattern of results was found for non-penetrative sexual activity partners (e.g., partners with whom participants had engaged in oral sex or other genital stimulation), but the difference between the two countries was significantly smaller. In other words, when comparing oral sex behaviors, Costa Ricans were more similar to U.S. college students than when comparing penile-vaginal penetration behaviors. This evidence suggests sexual practices may vary according to culture.

The notion of nuanced variation in sexual behavior is not recent. Anthropologists have noted that not only do sexual behaviors vary between cultures, so too do motivations for engaging in sexual behavior. Multiple authors have noted that for many cultures, reproduction represented the only acceptable motivation for sex, while in other cultures seeking physical pleasure was not only acceptable but a dominant motivation for engaging in sex (Erchak, 1992; Levin, 1994; Parker & Murray, 2012). Variations in sexual motivation are theorized to lead to differences in sexual behavior. For example, in cultures where pleasure represents the dominant

motivation for sex, behavioral differences, like having increased number of sexual partners, are theorized to follow.

### **Motivations for Sex: An Introduction**

Although motivations for sex have been examined periodically for decades, the topic has recently garnered increased attention. Investigators often use differing definitions, theoretical approaches, and analytical methodologies in researching motivations for sex. When a definition is offered, it can be typically be categorized in two ways. The first examines motivations for sex as the internal (e.g., feeling “horny”) and external (e.g., seeing a sexual partner naked) stimuli that precede and result in sexual behavior (e.g., Tang, Bensman, & Hatfield, 2012). Thus, motivations for sex are operationalized solely as the antecedents of sexual behavior. This definition can be contrasted with that of Cooper, Shapiro, and Powers (1998), who suggest motivations for sex are best understood by the reinforcers, both positive and negative, that accompany or follow sexual behavior. In this case, motivations are entirely defined by the consequences of sex.

Regardless of which definition is used, nearly all scales developed to measure different motivations for sex contain both types of motivations: (1) the antecedents that may cue sexual behavior, and (2) the consequences that reinforce it. In total, eleven different scales have been developed to measure sexual motives (Browning, 2004; Cooper et al., 1998; DeLamater & MacCorquodale, 1979; Hill & Preston, 1996; Horowitz, 2002; Leigh, 1989; Meston & Buss, 2007; Nelson, 1978; Peterson & Muehlendhard, 2011; Tang et al., 2012; Tiegs, Perrin, Kaly, & Hassacker, 2007) and each includes items that assess both types of motives. For example, the measure developed by Cooper and colleagues (1998) which utilizes the definition of motives as consequences of sex contains items related to antecedents such as “feeling horny.” Similarly, Tang and colleagues (2012) defined motivations for sex as the antecedents that cue sexual

behavior, yet developed a measure that includes multiple items related to its consequences, such as pleasing one's partner and receiving physical pleasure.

Combining the two definitions of sexual motivations may prove beneficial for many reasons. Excluding one or the other may provide an incomplete understanding of motivations. Focusing only on the antecedents may obscure many other important reasons why humans engage in sexual behavior. During orgasm, for instance, physical pleasure is heightened, but feelings of emotional closeness precipitated by oxytocin often occur during and immediately after orgasm (e.g., Carmicheal, Warburton, Dixen, & Davidsen, 1994). Examining only the antecedent that cued sexual behavior, in this case, would not aid in understanding the relative importance of orgasm and emotional closeness.

Ignoring the antecedents, however, may also impair understanding of motivations for sex. Seeing an attractive partner is often cited as a motivation for sex, but this motive may be more complex. For men, the novelty of a sexual partner appears to enhance their attractiveness, whereas consistency appears to enhance the attractiveness of a partner for women (e.g., Mosher & MacIan, 1994). Meston and Buss (2007) include items related to novelty and consistency in their measure and find significant differences between men and women in the expected directions, with women reporting greater motivations related to consistency and men reporting greater motivations related to novelty. Ignoring antecedents would diminish this distinction and the understanding of motivations for sex.

Finally, even focusing on immediate antecedents *and* reinforces of sex may also be incomplete, as sex may occur in pursuit of long-term goals. Meston and Buss (2007), Horowitz (2002), Tang (2010) and Browning (2004) find participants often report having sex solely for procreation. Although having a child could be considered a reinforcer, that reinforcer would be too distal, rarely provided, and inconsistently provided. This motivation may be better

understood as a long-term goal that serves to increase the likelihood of sexual behavior, even in the absence of other reinforcers. Procreation is certainly not the only long-term goal that has been commonly reported. Meston and Buss (2007) find enough distinct long-term-goal motivations that they form five distinct dimensions. Taken together, it appears that motivations for sex may be best understood as the antecedents, reinforcers, and goals that give rise to sexual behavior.

### **Groupings of Motivations**

Numerous motivations for sex have been found. Authors who examine qualitative data find tremendous diversity among these motivations. One research group reported identifying 237 different reasons for having sex from open ended questions asked of college student participants (Meston & Buss, 2007). Another group found 212 distinct motivations while employing a similar methodology (Cooper et al., 2012). With this tremendous diversity, attempts to understand motivations for sex have focused on finding meaningful groupings or dimensions of motivations. For instance, nine scales have been developed and validated through empirical methods (e.g., exploratory factor analysis; Browning, 2004; Cooper et al., 1998; Hill & Preston, 1996; Horowitz, 2002; Leigh, 1989; Meston & Buss, 2007; Peterson & Muehlendhard, 2011; Tang, 2010, Tiegs et al., 2007). Each scale, however, varies dramatically in the number of factors found. Using exploratory factor analysis (EFA), as few as two factors (Personal Pleasure and Personal Benefit in a Relationship; Tiegs et al., 2007) and as many as 18 factors (e.g., Browning, 2004; Tang, 2010; see Table 1) have been found. Most of these measures suggest a larger number of factors is necessary to adequately capture the global construct of motivations for sex. Of the nine measures of motivations for sex evaluated by EFA, eight include six or more factors.

Although motivation for sex scales differ in the number of factors found, there is substantial consistency in some of their core factors. Specifically, the same six factors appear on nearly all measures: (1) physical pleasure, in which a person engages in sex for physical enjoyment (e.g., “because it feels good”), (2) partner pleasure, in which a person engages in sex in order to provide a partner with physical pleasure (e.g., “I wanted to give my partner an orgasm”), (3) emotional closeness, in which emotions such as love are primary motives (e.g., “I wanted to feel close to my partner”), (4) stress reduction, in which stress is used as a form of negative emotion coping (e.g., “because I was stressed and wanted to feel better”), (5) pressured compliance, in which a person has sex because a partner uses forceful requests (e.g., “my partner wouldn’t leave me alone”), and (6) role fulfillment, in which a person engages in sex in order to fulfill expectations in a given role (e.g., “I wanted to be a good husband”). All but one scale (Hill & Preston, 1996) include physical pleasure as a factor. All nine scales developed through empirical methods include at least one factor related to pleasing a partner. Six of them distinguish between pleasing a partner as a part of role fulfillment and pleasing a partner for its own sake (Browning, 2004; Hill & Preston, 1996; Horowitz, 2002; Leigh, 1989; Meston & Buss, 2007; Tang, 2010). Eight of the nine include factors related to stress reduction and emotional closeness (Browning, 2004; Cooper et al., 1998; Hill & Preston, 1996; Horowitz, 2002; Leigh, 1989; Meston & Buss, 2007; Tang, 2010; Tiegs et al., 2011).

Scales mostly differ in the number of factors added to the above-described basic six and the content of these additional factors. Two scales contain 18 factors (Browning, 2004; Tang, 2010). Other scales contain 13 (Meston & Buss, 2007), 9 (Horowitz, 20002), 8 (Hill & Preston, 1996), and 7 factors (Leigh, 1989). These scales often differ in their content and some find unique factors that are not measured by other scales. For example, Meston and Buss (2007) find two unique factors important to evolutionary psychology: (1) mate guarding – the process by

which an individual engages in sexual or affectionate behavior in order to prevent a partner from engaging in sex outside of the relationship – and (2) physical desirability – being motivated by a partner’s physical attractiveness.

Across these nine different scales, a total of 21 different factors for motivations of sex have been identified, 15 more than the basic six found in most measures. Table 1 shows a list of all 21 different motives and examples of scales that contain each motive. The 15 that are added to the basic six are as follows: (1) spirituality, a motive characterized by having sex in order to enhance or obtain spiritual experiences, (2) dominance, a motive characterized by having sex with a partner in order to assert one’s power over the partner, (3) rebellion, which is characterized by having sex because it is against social norms or standards, (4) peer conformity, which relates to engaging in sex in order to conform to social norms, (5) making amends, a motive in which sex is used as a way to “make up” with a partner, (6) procreation, which entails having sex in order to become pregnant, (7) recognition, which relates to having sex so that others will be impressed and to building a better reputation, (8) experimentation, which entails having sex in order to gain new experiences, (9) submission, a motivation that encompasses having sex in order to have a partner seem powerful, (10) safety and protection, in which people have sex in order to gain the protection of a partner from others, (11) revenge, a motivation that emphasizes having sex with someone other than a romantic partner in order to exact revenge on a partner, (12) financial gain, in which sex is exchanged for money, (13) physical desirability motivation, as described above, (14) utilitarian goals, a motivation in which an individual uses sex in order to get the sexual partner to do something for them, and (15) mate guarding, also described previously.

### **Sexual Behavior Correlates of Motivations for Sex**



Although investigators have not often examined the relations between comprehensive measures of motivations for sex and sexual criterion measures, the basic six factors differently predict a number of sexual behaviors (Cooper, Agocha, & Sheldon, 2000; Cooper et al., 1998; Patrick & Lee, 2010; Patrick, Maggs, & Abar, 2007). The relations found between sexual criterion variables and motivations for sex often fit theoretical predictions. For example, people who engage in sex primarily for physical pleasure should (1) not require that sex occur exclusively in the context of intimate relationships, (2) find sex more physically enjoyable, and (3) engage in sex more frequently compared to those who do not engage in sex primarily for physical pleasure. Correlational analyses appear to support these predictions, as the pleasure factor relates positively to number of sexual partners, age at sexual debut, risky sexual behavior (e.g., sex without a condom or anal sex) and frequency of sex (Cooper et al., 2000; Cooper et al., 1998; Patrick & Lee, 2010; Patrick et al., 2007).

The intimacy factor relates to the same variables in a different pattern, but one that is consistent. Those who engage in sex for reasons of emotional closeness should, theoretically, be more likely to engage in sex with a limited number of partners so that a close relationship can be established. In this way, sex would be highly rewarding, even if not primarily physically, and sex could be expected to occur more frequently with the same partner. Thus, unlike the physical pleasure factor, the emotional closeness factor should relate negatively to number of sexual partners, while still relating positively to frequency of sex. These predictions are largely supported by correlational analyses, as emotional closeness positively relates to frequency of sex, but negatively relates to number of lifetime partners and risky sexual behavior. Lastly, emotional closeness does not appear to relate significantly to age at sexual debut (Cooper et al., 2000; Cooper et al., 1998).

**Sexual risk correlates.** Motives for sex appear to overlap tremendously with sexual risk. Cooper and colleagues (2008) find the physical pleasure motive positively relates to history of sexually transmitted illnesses (STIs) and number of unplanned pregnancies. Relatedly, a few investigators have examined the relation between condom use and different motivations for sex. These investigations differ substantially, as one utilized the Sexual Motives Scale (SMS; Cooper et al., 1998), which contains only six factors, while the other utilized the Comprehensive Sexual Motives Inventory Catalogue (COSMIC; Browning, 2004), which contains 18 factors. Both, however, found the emotional closeness factor for each respective scale negatively related to condom use. Condom use also positively related to a number of other factors on the COSMIC that were not included in the SMS, such as stress reduction, experimentation, social approval, dominance, submission, safety, rebellion, peer conformity and revenge. Rather unsurprisingly and demonstrating the importance of distinguishing between factors, the procreation motive from the COSMIC negatively related to condom use.

**Sexual dysfunction correlates.** Within the clinical domain, those working with sexual dysfunction have noted the importance of motivations for sex for sexual dysfunction and its treatment. These clinicians suggest that a lack of other-focused motives (e.g., being motivated by partner pleasure) worsens erectile functioning and reduces the effectiveness of treatment for erectile dysfunction (e.g., Leiblum & Rosen, 1992). Efficacious therapies for multiple forms of sexual dysfunction tend to include two components: (1) exercises designed to make sexual contact more rewarding, and (2) relationship-building activities (e.g., Heiman & Meston, 1997). These two steps are derived from the original work of Masters and Johnson (1970) in the treatment they termed *sensate focus*.

Important for the current study, in both phases of sensate focus treatment, couples must exhibit motivation for enhancing a partner's sexual pleasure. Without at least some other-

focused motivation for sex, treatment of sexual dysfunction becomes increasingly difficult to administer. Despite their importance for treatment of sexual difficulties, motivations for sex have not been studied extensively in relation to sexual dysfunction and its treatment. Much of the evidence suggesting a relation between sexual dysfunction and motivations for sex stems from anecdotal evidence (e.g., Leiblum & Rosen, 1992). The author has had similar experiences working with individuals with erectile dysfunction, in which a lack of partner-focused motives appeared to reduce the acceptability of sensate focus treatment. Empirical investigations are needed to better understand how motivations for sex relate to sexual dysfunction and treatment acceptability.

### **Ethnocultural and Gender Differences in Motivations for Sex**

In addition to sexual outcome differences, gender and ethnocultural differences have been found among sexual motivation factors. Women endorse emotional closeness and submission motivations more than men (Browning, 2004; Cooper et al., 1998), while men endorse most other motives more than women (Browning, 2004; Cooper et al., 1998; Hill & Preston, 1996; Meston & Buss, 2007; Tang et al., 2012). Perhaps the most consistent finding is that men endorse physical pleasure and stress reduction motivations more than women (Browning, 2004; Cooper et al., 1998; Hill & Preston, 1996; Meston & Buss, 2007). Meston & Buss (2007) find the greatest number of gender differences, with men endorsing 11 of the 13 motivations more than women. In fact, the only two motivations that men did not endorse significantly more than women were partner pleasing and emotional closeness motives. From this study it would appear as though gender differences in motivations for sex are the norm rather than the exception.

Although mean differences are often found, sexual motives scales seem to apply equally well to women and men, as model fit (Cooper et al., 1998) and internal consistency (Browning, 2004; Cooper et al., 1998; Meston & Buss, 2007) appear approximately equivalent across men

and women. Thus, it does not appear that these measures assess different constructs for men and women, but that the differences found may be accurate reflections of many gender differences across motivations for sex.

In addition to gender, differences have been found across ethnic groups in motivations for sex (Browning, 2004; Cooper et al., 1998; Horowitz, 2002; Tang, 2010; Tang et al., 2012). Many of these are consistent with cross-cultural research findings. One study (Browning, 2004) examined mean differences in sexual motivations between Anglo American, Asian American, and Hawaiian/Pacific Islander adult participants (Browning, 2004). Many of the researchers' hypotheses regarding culture group differences, hypotheses relying on differences between individualist and collectivist cultures, were supported. First, Asian Americans endorsed peer conformity motives more than Anglo Americans (Browning, 2004; Tang, 2010; Tang et al., 2012). Also, Asian Americans endorsed other socially focused motivations such as making amends and submission more often than did Anglo Americans. In contrast, Anglo Americans endorsed the self-focused motive of stress reduction more than Asian Americans. In summary, sexual motivations that were focused on the individual were more prevalent in Anglo American participants, while motivations focused more on others (collectivist motives) were endorsed more frequently by Asian Americans.

Tang and colleagues (2012) also examined sex motivation differences in a cross-national study of a U.S. sample and a Chinese sample. This study explored cross-national differences in four motivations hypothesized to represent collectivist and individualist motives. The two collectivist motives were (1) partner pleasure and (2) role fulfillment (or relationship maintenance). The two individualist motives were (1) self-pleasure, and (2) stress reduction. The only hypothesized difference that was found across cultures was the U.S. sample endorsed the stress reduction motivation more than the Chinese sample. However, when examining these

differences separately for each gender, Tang and colleagues find Chinese men endorse partner pleasure and role fulfillment motives more than U.S. men, while U.S. women endorse the pleasure motive more than Chinese women. Although many of the gender-specific effects were not predicted by the author, these data generally conform to hypothesized cultural differences between the U.S. and China. Although more investigation is certainly needed, these data highlight the importance of both gender and ethnocultural differences in motivations for sex.

**Ethnocultural influences on the identification of sexual motive factors.** Important ethnocultural differences can also be seen in the development of factors of motivations. As highlighted previously, the number of motivations for sex that are included in measures varies widely. Ethnocultural differences of samples during item and factor development of measures of motivations for sex may account for many of the differences.

Most measures of motivations for sex were developed utilizing predominately Anglo American samples (Cooper et al., 1998; DeLamater & MacCorquodale, 1979; Hill & Preston, 1996; Leigh, 1989; Meston & Buss, 2007; Peterson & Muehlendhard, 2011; Tiegs et al., 2007). Scales developed with these samples typically contain eight or fewer factors (Cooper et al., 1998; DeLamater & MacCorquodale, 1979; Hill & Preston, 1996; Leigh, 1989; Peterson & Muehlendhard, 2011; Tiegs, Perrin, Kaly, & Hassacker, 2007). Only one scale development study with a predominately Anglo American sample found more than eight factors. Meston and Buss (2007) developed a scale containing 13 factors, though their initial EFA suggested only four factors.

The most comprehensive measures of sexual motives, however, were developed with ethnoculturally diverse samples (Browning, 2004; Tang, 2010). During the development of the COSMIC (Browning, 2004), item generation was conducted with two samples consisting of Thai college students and participants who were recruited at the University of Hawaii campus. Those

who were recruited from the University of Hawaii represent one of the most racially/ethnically diverse samples used in this literature, as no single ethnicity comprised the majority of participants. In this sample, approximately one third indicated being native Hawaiian, one third indicated being Anglo American, one sixth indicated being Asian American, and the remaining one sixth were other Pacific Islanders, African American, or Hispanic. The Thai sample also represents one of the only non-U.S. samples to be included in any study of motivations for sex, though Thai participants were not included in subsequent factor analyses of this measure.

Before surveying participants for additional motives, Browning (2004) included all motives that had previously been reported in other measures, which resulted in a total of a 16 motives. Once the 16 motives taken from previous research were established, the two diverse samples answered open-ended questions regarding their reasons for having sex. This process yielded a total of four factors that Browning (2004) had not already included, two of which were entirely unique. In the Thai sample, the study yielded two additional motives: (1) role fulfillment, and (2) possession. The possession factor represents a unique factor that is not included in any other measure. Two factors were also provided by the relatively diverse University of Hawaii sample: (1) rebellion, and (2) making amends. The rebellion factor also represents a unique factor that is not included in any other measure. Given that only 21 unique dimensions of motivations for sex have been identified, the two motives added by these ethnocultural diverse samples represent a large contribution. Further, these added factors may highlight important ethnocultural differences in the number and content of dimensions of motivations for sex and not just relative mean differences in motivations.

Once items that reflected the 20 proposed factors of motivations for sex were generated by the investigator, Browning (2004) conducted an EFA. This analysis was completed with a separate sample recruited at the University of Hawaii consisting of both students and community

members. This sample was similar to the sample recruited for item generation with regard to ethnic makeup. EFA was conducted with all ethnic groups combined. This represents a significant improvement over attempts to measure and validate motivations for sex with regard to sample diversity. However, this aggregated analytic strategy does not allow for comparisons of factor structures across ethnic groups and could potentially mask important differences. For example, if two motivations overlap tremendously for multiple ethnic groups, but do not overlap for one particular subgroup in the global analysis, then factor analyses may suggest that these two factors are a singular motivation. While such findings may represent the true state of affairs for groups where the motivations do overlap tremendously, such findings could mask the distinction between the two motives for the particular subgroup. For instance, it may be that partner pleasure is actually comprised of two (or more) sub-factors, such as partner's physical pleasure and partner's need for emotional closeness. To the extent that motives have been examined in ethnic groups where those two (hypothetical) sub-factors are highly overlapping, they may look like a single motive (partner pleasure). Examining ethnically aggregated factor analyses certainly provides some benefits, but exploration of the construct of motivations for sex should also examine if and how these motivations differ in their makeup as a function of ethnicity. Given that sexual behavior and motives appear to vary widely, in part as a function of culture, then potential ethnocultural differences in factor structure must also be examined. The process of validating constructs and their measures with ethnocultural diversity may be especially important in the U.S. where ethnic minorities comprise ever-larger subsections of the overall population (U.S. Census Bureau, 2011).

### **Methodological Influences on the Identification of Sexual Motive Factors**

In addition to ethnocultural differences in study samples, the differences in analytical and methodological approaches researchers take may explain some of the variation in the number of

motivations that have been reported. From item generation to factor analyses, the methods involved in measure development and construct validation vary significantly. Some of these methodological approaches are reviewed next.

Cooper and colleagues (1998) developed the Sexual Motivations Scale (SMS), which is perhaps the most thoroughly validated scale to measure different motivations for sex. It is the only scale for which published data exist for EFA, convergent validity, divergent validity, reliability, and CFA methods. Some of these findings were described above, such as the negative correlation between intimacy motives and number of sexual partners (Cooper et al., 1998; Cooper et al., 2000; Patrick & Lee, 2010; Patrick et al., 2007). One limitation to the development of the SMS, however, was in the approach the authors took to identify the number of motivations for sex. Each step of measure refinement and validation was informed and influenced by the overarching theoretical structure proposed by the authors. This approach may have provided greater consistency for the factors explored by this measure, but it may have also limited the breadth of the measure since any one theoretical approach may not be able to account adequately for many motivations for sex.

As highlighted previously, Cooper and colleagues (1998) defined motivations as the reinforcers for sexual behavior. As a result, the authors proposed a theoretical structure that was compatible with this definition (though items that describe antecedents were also included in the measure). They suggest motivations for sex can be categorized along two dimensions of reinforcement: (1) positive vs. negative reinforcement, and (2) individual vs. social reinforcement. The two dimensions create four possible combinations of reinforcement that form separate categories: (1) individual positive reinforcement (e.g., physical pleasure), (2) individual negative reinforcement (e.g., stress reduction), (3) social positive reinforcement (e.g., social recognition), and (4) social negative reinforcement (e.g., pressured compliance motives



that avoid conflict). Item generation was influenced by the four-category theoretical structure. During item generation, the authors solicited responses to open-ended questions about motivations for sex, but the overwhelming majority of these responses were discarded and excluded from subsequent factor analyses. The authors generated a list of 58 items that would be submitted to EFA that was only partially derived from the 212 unique responses provided by participants. The remaining items were derived from previous measures of motivations for sex or were created to represent one of the four proposed categories of motivations for sex. Only items that appeared to fit with the proposed theoretical structure were included in any factor analysis. In short, Cooper et al. (1998) appear to have constrained the breadth of motivations for sex to fall neatly within their four-category model.

Many of the methods Cooper et al. (1998) employed during EFA may also account for some of the limited factors identified by the SMS. An initial factor analysis was conducted with 476 participants (60% male) who were predominately Anglo American (76%) and relatively young ( $M_{age} = 19.1$  years). Analytical procedures (e.g., extraction criteria) were not described. Following this factor analysis, the list of 58 items was reduced to 44, although the criteria for removing these items were not provided. It is unclear why 14 items (24% of the original list) were removed, but removing so many items simultaneously, as opposed to iteratively, possibly reduced the breadth of the measure as well. A third factor analysis was conducted with a separate sample of 241 participants (36% male) that was also predominately Anglo American (83%) and relatively young ( $M_{age} = 19.9$  years). Nine factors were extracted following the Kaiser rule. The authors also suggest that a seven factor solution would be appropriate according to the scree plot. An eight factor solution was also examined. The authors reported factors seven, eight, and nine failed to provide stable solutions (i.e., with multiple items loading more than 0.40 and less than three complexly loaded items) across all solutions that were examined.

Alternatively, in all of the solutions examined, factors one through six contained multiple items with factor loadings greater than 0.40 and less than three complexly loaded items. The six items (14% of the previous scale) that did not load uniquely onto factors one through six were then simultaneously removed. Again, iterative removal of items would have increased the possibility of finding greater breadth in the measure than after simultaneous removal. A third EFA was conducted while extracting six factors. This factor analysis provided a solution with multiple items loading highly (factor loadings greater than 0.40) and few (less than 3) complexly loaded items. Following EFA, five items were added and 15 other items were removed. These 29 items were not subjected to any further EFA, but were included in subsequent confirmatory analyses.

Browning (2004) explicitly stated that the purpose of developing the COSMIC was to develop a more comprehensive measure of motivations for sex than those captured by the SMS (Cooper et al., 1998) and other measures. Browning primarily combined motives from previous measures, although the author did not use the individual items derived from these other measures. Multiple items were generated for each of the 21 different motives Browning identified. These items were then submitted to EFA with the scree plot and Kaiser rule utilized to extract factors.

The initial phases of item generation and factor analyses of the COSMIC (Browning, 2004) thus differed from the SMS (Cooper et al., 1998) in two important ways that may have led to increased comprehensiveness. First, Browning (2004) explicitly attempted to explore additional motivations for sex, beyond the six included in the SMS. Many of the items generated for the COSMIC were intentionally developed to form additional motives that would be distinct from those comprising the six subscales of the SMS. Second, participant responses were not rejected or limited based on the theoretical approach of the author. Thus, approach to item

generation in the COSMIC was intentionally broader (and essentially atheoretical) compared to the approach taken for the SMS.

More recently, Meston & Buss (2007) sought to expand motivations for sex in a newly created measure, the Why Have Sex (or YSEX). The authors generated items by asking college student participants open-ended questions regarding the reasons why they have sex. After removing redundant reasons, the authors reported identifying 237 different reasons for having sex. These myriad reasons were then converted into measurement items and administered to a large sample. Similar to samples utilized by Cooper and colleagues (1998), the 1,547 participants used for the Meston and Buss EFA were mostly Anglo American (62%) and relatively young ( $M_{age} = 19.0$  years). To this point, the measure development strategy of the YSEX resembles the approach utilized for the SMS (Cooper et al., 1998). The development of these two measures differed, however, in their approaches to EFA. In contrast to the SMS, all of the YSEX items were included in subsequent factor analyses, as opposed to the very limited subset included in initial factor analyses of the SMS. Utilizing all items provided by participants, while atheoretical, potentially allows for greater breadth in the number of motivations examined. Although large numbers of items were removed from this scale prior to conducting a second EFA (95 items), similar to item removal for the SMS, substantially more items were included in the final version of the YSEX (142 items).

Although the YSEX (Meston & Buss, 2007) is quite comprehensive, nearly all of the resulting 18 factors evidenced good internal consistency ( $\alpha > .80$ ). Approximately half of the factors evidenced even better internal consistency ( $\alpha > .90$ ). The one factor that did not provide such high internal consistency (financial motive) still evidenced adequate internal reliability ( $\alpha = .79$ ). The procreation motive appeared to be the most consistent ( $\alpha = .96$ ).

Despite some of the sample limitations of attempts to identify and measure motivations for sex, many of these initial investigations have established an important foundation for research. Some researchers have attempted to explore and validate different sex motives solely to predict other variables of interest (Horowitz, 2002; Nelson, 1978; Peterson & Muehlendhard, 2011; Tang et al., 2012; Tiegs, Perrin, Kaly, & Hassacker, 2007), while other researchers have been primarily interested in sexual motivations in and of themselves, exploring differing motivations and attempted to validate them (Browning, 2004; Cooper et al., 1998; DeLamater & MacCorquodale, 1979; Leigh, 1989; Meston & Buss, 2007). Some researchers have been interested in quantifying a comprehensive list of motivations – as many as 18 factors have been listed in a single sample (Browning, 2004; Meston & Buss, 2007). Other attempts have focused on narrower, theoretically driven motivations (e.g., Cooper et al., 1998). Those that have utilized comprehensive methods have employed EFA and reliability analyses to assess construct validity, but have yet to refine these measures with techniques such as confirmatory factor analyses (Browning, 2004; Meston & Buss, 2007).

### **Factor Structure Examined with Confirmatory Methods**

The SMS remains the only measure of motivations for sex that has been examined with confirmatory techniques. The steps outlined above that preceded CFA may have added to much of the stability of the factors, but reduced the number of first-order factors examined to six: (1) a pleasure factor termed Positive Self-Enhancement, (2) an emotional closeness factor termed Emotional Intimacy with Partner, (3) a stress reduction factor called Negative Mood Coping, (4) a recognition factor termed Self-Affirmation, (5) a pressure compliance factor termed Partner Approval, and (6) a peer conformity factor termed Peer Approval. Based on the theoretical approach used by the authors, two second-order factors (Aversion of Negative Self-Evaluations and Aversion of Negative Other-Evaluations) were added to this model. Figure 1 shows the full

model. Both the hierarchical and simple (i.e., the one without higher order factors) models produced adequate fit according to most model fit indices – Normed Fit Index (NFI) values > 0.90, Comparative Fit Index (CFI) values > 0.90, and Standardized Root Mean Square Residual (SRMR) values < 0.05. Though these data support the distinctions between motivations for sex, more comprehensive measures such as the YSEX (Meston & Buss, 2007) or the COSMIC (Browning, 2004) have not been examined using confirmatory techniques. Work must now be done to examine the 21 unique factors that have been supported in various other work (see Table 1) utilizing confirmatory techniques. Furthermore, given the ethnocultural diversity observed in motivations for sex, these confirmatory analyses need to compare models across ethnocultural groups.

### **Purpose**

Four distinct aims were explored for the current study: (1) validate previously found comprehensive factor structures of motivations for sex, (2) explore the factor structures and content of motivations for sex with multiple ethnocultural groups, (3) examine the relations between motivations for sex and relevant clinical correlates, such as sexual functioning and sexual satisfaction, and (4) explore how differences that might exist between ethnocultural groups in factor structure or content may relate to sexual behavior and sexual functioning. Research investigating motivations for sex as distinct but related constructs has either thoroughly refined the constructs and their factor structure to a limited number of motivations (e.g., Cooper et al., 1998) or provided comprehensive factor lists comprised of several motivations for sex without thorough analyses that refine and confirm the factor structure (e.g., Browning, 2004). Aim 1 augmented this literature by providing a comprehensive confirmation of the factors comprising motivations for sex. Additionally, much of this literature has been conducted with predominately Anglo American samples (e.g., Meston & Buss, 2007) and, when diverse samples

have been utilized (e.g., Browning, 2004), ethnocultural differences in factor structure and content have not been explored. Aim 2 directly addressed this limitation by exploring any factor differences between multiple ethnic groups living in the U.S. Lastly, clinicians have cited anecdotal evidence that motivations for sex may impact clinical outcomes such as sexual functioning, sexual satisfaction, and relationship functioning, but these hypothesized relations have yet to be examined empirically. Aim 3 provided an initial exploration of these relations and allow for comparisons between motivations for sex and clinical outcomes. Aim 4 explored ethnocultural differences in the relations between motivations for sex and clinical correlates.

### **Research Questions**

As the aims of this study are exploratory, no specific hypotheses were proposed. Instead, five research questions were examined:

RQ1) Can the 21 unique factors that have been previously found in research regarding motivations for sex be supported utilizing confirmatory techniques?

RQ2) Do confirmatory factor analytic results from RQ1 generalize across four different ethnic groups?

RQ3) Do ethnic groups differ in the degree to which common motivations for sex are endorsed?

RQ4) Which motivations for sex correlate with sexual functioning, sexual satisfaction, and relationship satisfaction?

RQ5) Do motivations for sex correlate with sexual functioning, sexual satisfaction, and relationship satisfaction similarly across different ethnic groups?

### **Method**

#### **Participants**

A total of 923 adult community participants were recruited. Inclusion criteria were: (a) currently sexually active; and (b) currently in a romantic relationship. Six participants who

appeared to respond carelessly (for additional information on attention items, see Measures section) were excluded. The remaining 917 participants were included in data analyses. Participants were recruited from each of the four largest ethnic groups in the U.S.: 474 Caucasian, 194 Latino, 131 African American, and 118 Asian American participants. Most participants were female (total female  $N = 586$ , 63.6%), and this was true for each ethnic group; Caucasian ( $N = 261$ , 55.1%), Latino ( $N = 144$ , 74.2%), African American ( $N = 78$ , 66.1%), and Asian American ( $N = 99$ , 75.6%). Mean age was 31.61 years ( $SD = 10.95$ ). Anglo American participants were significantly older and had been in a relationship significantly longer than other ethnic groups ( $p$ -values  $< .05$ ). Ethnic groups did not differ across any other demographic or sexual history variable. Most participants reported having two or fewer sexual partners within the last year ( $N = 747$ , 81.5%). Participants reported an average of approximately 18 years of age at sexual debut ( $M = 17.72$ ,  $SD = 3.12$ ). Participants also reported being in their current relationship for an average of approximately 6 years ( $M = 5.85$ ,  $SD = 7.33$ ). Most participants reported an exclusively heterosexual orientation ( $N = 535$ , 58.3%), a minority of participants reported an exclusively same-sex orientation ( $N = 36$ , 3.9%), and a substantial minority of participants reported a sexual orientation that was not exclusive to one sex ( $N = 311$ , 33.9%). Demographics are summarized in Table 2.

Participants were recruited through three sources: (1) MechanicalTurk<sup>TM</sup>, an internet-based recruitment and participant payment service, (2) advertisements on publicly available classified websites (e.g., Craigslist) and, (3) social media websites (e.g., Facebook). The survey lasted approximately 30 minutes. Participants recruited from MechanicalTurk<sup>TM</sup> received \$1.00 total compensation. Participants recruited from the other two strategies were entered into a raffle for \$50 gift cards. Participants completed an initial screening to ensure they met inclusion criteria. Participants who met inclusion criteria were provided with the link to the full survey.

Participants recruited from MechanicalTurk™ were provided \$0.08 for completing the screening. Participants completing the screening were informed that the screening survey would be utilized to determine eligibility for the larger study, but were not informed as to the exact inclusion criteria. Most participants ( $N = 514$ , 56.1%) were recruited via internet classified (e.g., Craigslist) or social media (e.g., Facebook) advertisements (for additional information regarding recruitment of participants, see Appendix A).

### **Procedure**

Participants were directed by the advertisement on the recruiting website to the web address for the study. All participants completed all study procedures, including eligibility screening, through either SurveyMonkey or Qualtrics internet survey software. Once participants viewed an informed consent webpage and agreed to participate, they were presented with a series of questionnaires. These included: items from the YSEX (Meston & Buss, 2007); the COSMIC (Browning, 2004), the Laumann Sexual Functioning Index (Laumann, Paik, & Rosen, 1999), the Global Measure of Sexual Satisfaction (GMSEX; Lawrence & Byers, 1998), the seven-item short form of the Dyadic Adjustment Scale (DAS-7; Busby, Christensen, Crane, & Larson, 1995), and a demographic and sexual history questionnaire. Descriptive information regarding the GMSEX, DAS-7, and LSFI are summarized in Table 3. Each measure is described below in greater detail. Each participant, regardless of recruitment source, completed the same series of questionnaires. Once participants finished, a debriefing page with instructions specific to their compensation was presented. Participants were given additional information regarding the purpose of the study and thanked for their participation.

### **Measures**

**Motivations for sex.** In order to assess a comprehensive set of motivations for sex, two measures were combined. Subscales from the YSEX (Meston & Buss, 2009) and the COSMIC



(Browning, 2004) were combined into one questionnaire. These two questionnaires were selected as they represent the two most comprehensive measures for which published data are available and combining them provides the 21 unique factors that have previously been found. All 72 items representing 18 subscales from the COSMIC were included, followed by the 29 items representing the three subscales unique to the YSEX (Physical Desirability, Utilitarian Goals, and Mate Guarding). The combined questionnaire consisted of 101 items. Items from the YSEX were interspersed throughout the COSMIC. As the two measures do not have equivalent response sets, response sets were modified such that participants were asked to rate how often they have sex for each reason and asked to rate this frequency on a 1 (rarely) to 5 (almost always) scale. Higher scores indicate engaging in sex more frequently for that reason. Additionally, every item on the COSMIC begins with the word “because”. As such, items on the YSEX were modified so they also began with the word “because”.

In prior studies, half of the 18 scales from the COSMIC (partner pleasure, role fulfillment, stress reduction, experimentation, recognition, procreation, making amends, spirituality, and peer conformity) evidenced excellent internal reliability ( $\alpha > .90$ ; Browning, 2004), eight (personal pleasure, emotional closeness, dominance, submission, pressured compliance, safety, rebellion, and revenge) evidenced good reliability ( $\alpha > .80$ ), and one (financial) evidenced adequate reliability ( $\alpha = .79$ ). The three scales that were added to the COSMIC from the YSEX (Meston & Buss, 2007) have evidenced adequate or better internal reliability ( $\alpha > .70$ ). The mate guarding ( $\alpha = .79$ ) and utilitarian goals ( $\alpha = .76$ ) motivations evidenced adequate internal reliability, while the physical desirability motive evidenced good internal reliability ( $\alpha = .80$ ). Descriptive information can be found in Table 4.

**Attentional items.** Several additional response items were added to the motivations for sex measures in an effort to better assure that participants provided effortful responses. Items

were taken from a list of “bogus” items which Meade and Craig (2012) found discriminated between participants providing effortful responses and participants providing more careless responses. In the current study, participants who failed to provide correct responses for the majority of these items ( $n = 6$ ) were considered to have provided careless responses and were excluded from analyses.

**Sexual functioning.** In order to assess sexual functioning, an adapted version of the Laumann Sexual Functioning Index (LSFI; Laumann et al., 1999) was utilized. The original LSFI consists of seven single-item indicators assessing (1) sexual desire difficulties, (2) sexual arousal difficulties, (3) orgasm difficulties, (4) performance anxiety, (5) premature climax, (6) sexual pain difficulties, and (7) lack of pleasure during sex. This measure can be administered to both men and women. In the original version, participants are asked to indicate on a dichotomous scale which, if any, of the seven symptoms they have experienced over the last year. Reliability data are not available due to the nature of these items. In the current study, the measure was modified to assess the frequency with which participants experience each of the symptoms they endorse. If a participant indicated difficulties with one of the seven domains, they were asked to rate the frequency with which they have experienced these difficulties on a 1 (*rarely*) to 4 (*always or nearly always*) scale, with higher scores indicating greater frequency of difficulties. Scores were recoded as 0 for participants who indicated they did not experience the specified difficulty. This rating scale has been used in previous studies examining sexual behavior and sexual functioning (Bridges & Morokoff, 2011). A composite sexual functioning score was formed by computing the average frequency ratings of LSFI items.

In order to assess sexual satisfaction, an important domain that is often included in assessments of sexual functioning, the Global Measure of Sexual Satisfaction (GMSEX; Lawrence & Byers, 1998) was used. The measure has evidence good internal consistency ( $\alpha =$

0.96) and test-retest reliability over a period of 18 months ( $r_{xx} = 0.73$ ). Participants rate their sexual relationship across five items on a seven-point bipolar scale, with higher scores indicating greater satisfaction. The bipolar anchors for each scale are: (1) *good* and *bad*, (2) *pleasant* and *unpleasant*, (3) *positive* and *negative*, (4) *satisfying* and *unsatisfying*, and (5) *valuable* and *worthless*. Descriptive information can be found in Table 3.

**Relationship satisfaction.** Relationship satisfaction was assessed with the with the 7-item short-form of the Dyadic Adjustment Scale (DAS-7; Hunsley, Pinsent, Lefebvre, James-Tanner, & Vito 1995). Six of the seven items are rated on a six-point Likert-type scale, while the seventh item is rated on a seven-point Likert-type scale. Responses are summed, with higher scores indicating greater relationship satisfaction. The DAS-7 has been found to have adequate internal consistency ( $\alpha = .78$ ; Hunsley, Best, Lefebvre, & Vito, 2005). Further, in a study with 148 couples who had presented to a university clinic for marital distress and 122 couples recruited from the community, those who had presented for treatment scored significantly lower ( $M = 17.8, SD = 5.5$ ) than the community participants ( $M = 25.8, SD = 4.7$ ; Hunsley et al., 2005). Descriptive information can be found in Table 3.

**Demographics and sexual history.** Participants were administered a separate demographics questionnaire. This questionnaire included items regarding participants' ethnicity, age, gender, relationship status, sexual orientation, medical history, psychiatric history, and sexual history.

## Results

### Data Preparation

Prior to beginning analyses, data were examined for missingness and to determine if analytic assumptions (e.g., multivariate normality) had been met. Approximately one quarter of cases was missing at least some portion of the motivations for sex questionnaire ( $N = 227$ ,

24.8%). Little's test suggested these cases were not missing completely at random [MCAR;  $\chi^2(14,932) = 17,305.76, p < .001$ ]. In order to address this, full information maximum likelihood (FIML) estimation, which has been shown to produce the least amount of bias in data estimation (e.g., Enders & Bandalos, 2001), was used for all analyses that employed structural equation model (SEM). No other variable contained more than approximately 5% missing cases.

Data from the motivations for sex questionnaire were also significantly kurtotic (Mardia's coefficient = 136.39). As such, bootstrapped standard errors were used for analyses examining significance of individual correlations or regression coefficients. Maximum likelihood bootstrapping was conducted with 500 samples.

### **Step 1: CFA of Combined Motivations for Sex Questionnaire**

All confirmatory factor analyses (CFA) were conducted in R version 3.0.1. In order to examine RQ1, CFA was conducted examining the 21 unique factors of motivations for sex that have previously been found. The entire sample ( $N = 917$ ) was utilized in this step. Factors were allowed to correlate. Good fit is often evaluated based on the following criteria: Chi-square/df ratio  $< 2.0$ , CFI  $> 0.95$ , root mean square error of approximation (RMSEA)  $< 0.08$ , and SRMR  $< 0.08$  (Hu & Bentler, 1999); however, given the complexity of this model (i.e., 101 measurement items, 21 latent variables, and correlations between all latent factors) more lenient criteria were applied. Specifically, recommended cutoff values of 0.90 (Bentler & Bonnett, 1980), and chi-square/df values of 5.0 (Bollen, 1989) were considered as indicating adequate model fit. Model re-specification was examined based on the standardized residual covariance matrix. Items with multiple standardized residual covariances greater than 2.0 were examined as candidates for removal. Items were removed iteratively until improvement in model fit was asymptotic.

Fit indices for the initial model produced mixed results. Most indices suggested good model fit ( $\chi^2/df = 3.19$ , SRMR = .071, RMSEA = .049, 90% CI = .048-.050) and others

suggested poor fit [ $\chi^2(4,739) = 15,095.51, p < .001, CFI = .84$ ]. In exploring model respecification, 10 items were removed iteratively. Three items were removed from the Utilitarian and Physical desirability scales. One item each was removed from the Making Amends, Mate Guarding, Recognition, and Pleasure factors. Each item removed was not the highest loading item, contained at least five residual covariances greater than 2.0, and removal of the item did not result in altering the theoretical composition of the factor. Items removed are summarized in Table 4. Following this, model fit improved substantially, although some indices still indicated poor fit [ $\chi^2(3,794) = 11,208.27, p < .001, CFI = .87$ ] and most indices suggested good fit (SRMR = .052, RMSEA = .046, 90% CI = .045-.047,  $\chi^2/df = 2.95$ ). Other model modifications were examined to improve fit (e.g., crossloading items and correlating error variances), but none resulted in significant improvement in model fit. Factor loadings from the final model are summarized in Table 4. Overall, model fit appeared acceptable, given model complexity (21 factors and 91 items).

## **Step 2: Ethnic Invariance of Motivations for Sex**

In order to examine RQ2, confirmatory factor analyses were completed with the model derived from Step 1. In this model, ethnicity was examined as a grouping variable to test ethnic invariance. While the model remained the same for each ethnic group, estimates from the model (e.g., factor loadings) were allowed to differ between ethnic groups. Table 4 summarizes factor loadings across each ethnic group. The same model was tested again, but factor loadings were constrained to be equal across ethnic groups. Given the complexity of the model, each motivation was examined individually. In accordance with recommendations of Dmitrov (2010), chi-square difference tests were conducted comparing the unconstrained and constrained models. Significant chi-square difference tests indicate model variance.

Making Amends, Mate Guarding, Recognition, and Pleasure factors could not be examined individually due to having too few degrees of freedom for model identification. Other individual factors were iteratively examined first. The Partner Pleasing factor, as it was the best fitting and least variant factor, was then paired with the Making Amends, Mate Guarding, Recognition, and Pleasure factors in order to provide additional degrees of freedom for the evaluation of these factors without significantly impairing model fit. Table 5 summarizes model fit for each model and displays results from chi-square difference tests.

In total, chi-square difference tests were not significant for models comparing 14 of the 21 factors ( $p$ -values  $> .05$ ). Non-significant models included the Dominance, Experimentation, Love, Making Amends, Mate Guarding, Partner Pleasing, Physical Desirability, Pleasure, Pressured Compliance, Recognition, Role Fulfillment, Safety, Stress Reduction, and Submission factors. Chi-square difference tests were significant ( $p$ -values  $< .05$ ) for models of seven factors: Financial, Peer Conformity, Procreation, Rebellion, Revenge/Jealousy, Spirituality, and Utilitarian factors.

### **Step 3: Mean Differences**

In order to examine RQ3, analysis of variance (ANOVA) tests were conducted to examine mean differences for each motivation found to be invariant in step 2. Tukey's HSD *post hoc* tests were conducted with any ANOVA found to be significant. ANOVA tests were conducted with SPSS version 21.0.

Analyses were conducted with sums of the 14 factors found to be invariant in Step 2: Dominance, Experimentation, Love, Making Amends, Mate Guarding, Partner Pleasing, Physical Desirability, Pressured Compliance, Pleasure, Recognition, Role Fulfillment, Safety, Stress Reduction, and Submission. Table 4 summarizes descriptive statistics for each of these variables across the four ethnic groups. Utilizing a Bonferroni correction for family-wise error,

only Dominance,  $F(3, 913) = 7.82$ ,  $p_{corrected} = .006$ , and Role Fulfillment,  $F(3, 913) = 4.76$ ,  $p_{corrected} = .048$  differed significantly across ethnic groups. Tukey's HSD *post hoc* analyses suggested that Anglo Americans endorsed Dominance items less than Asian Americans ( $M_{diff} = -0.23$ ,  $p = .029$ ), Latinos ( $M_{diff} = -0.20$ ,  $p = .026$ ), and African Americans ( $M_{diff} = -0.34$ ,  $p < .001$ ). No other group differences were significant among the Dominance motivation ( $p$ -values  $> .05$ ). Tukey's HSD *post hoc* analyses suggested that African Americans endorsed Role Fulfillment motivations more than Anglo Americans ( $M_{diff} = 0.40$ ,  $p = .001$ ), Latinos ( $M_{diff} = 0.39$ ,  $p = .011$ ), and Asian Americans ( $M_{diff} = 0.38$ ,  $p = .036$ ). No other group differences were significant for the Role Fulfillment motivation ( $p$ -values  $> .05$ ). Ethnic groups did not significantly differ on any other motivation (corrected  $p$ -values  $> .05$ ).

#### **Step 4: Relations with Clinically-Relevant Sexual and Relationship Variables**

RQ4 was examined by exploring relations between factors found to be invariant in Step 2, the average of the seven LSFI frequency scales, the DAS-7 Satisfaction subscale, and the GMSEX. Structural equation modeling (SEM) techniques were used with each of these clinically-relevant variables as the outcome variable. Each motivation for sex was used as a predictor variable. Due to model complexity, each pair of motivations for sex and clinically-relevant variable was examined in a separate model. In all models, gender was examined as a control covariate for each correlation due to previously found gender differences in motivations for sex (Browning, 2004; Cooper et al., 1998; Hill & Preston, 1996; Meston & Buss, 2007; Tang et al., 2012). Gender did not significantly predict any of the clinically-relevant variables ( $p$ -values  $> .05$ ). A total of 42 regression relationships were examined. As such, a Bonferroni correction for family-wise error was utilized ( $\alpha = .001$ ). A summary of regression weights and significant of each is presented in Table 7.

**Sexual dysfunction.** Dominance, Making Amends, Mate Guarding, Pressured Compliance, Recognition, and Role Fulfillment motivations positively predicted to sexual dysfunction ( $p$ -values  $< .001$ ). Love and Pleasure motivations were negatively related to the sexual functioning ( $p$ -values  $< .001$ ). No other motivations were significantly related to sexual dysfunction ( $p$ -values  $> .001$ ).

**Sexual satisfaction.** Love, Partner Pleasing, Physical Desirability, Pleasure, and Stress Reduction motivations positively predicted sexual satisfaction ( $p$ -values  $< .001$ ). Pressured Compliance motivations negatively predicted sexual satisfaction ( $p$ -value  $< .001$ ). No other motivations related significantly to sexual satisfaction ( $p$ -values  $> .001$ ).

**Relationship satisfaction.** Love, Partner Pleasing, and Pleasure related positively with relationship satisfaction ( $p$ -values  $< .001$ ). Pressured Compliance negatively predicted with relationship satisfaction ( $p$ -value  $< .001$ ). No other motivations related significantly to relationship satisfaction ( $p$ -values  $> .001$ ).

**Ethnic invariance of motivations for sex and clinically-relevant relations.** RQ5 was examined by comparing regression weights across ethnic groups. Similar to Step 2, ethnicity was examined as a grouping variable and models were allowed to vary between each ethnic group. In the first model, the unconstrained model, all paths were allowed to vary between groups. In subsequent models, individual regression weights were constrained to be equal across ethnicities. Given model complexity, regression weights were explored with each motivation and each correlate individually. Chi-square difference tests were then conducted comparing the constrained and unconstrained models. Significant chi-square tests were interpreted as indicating differing regression weights between ethnicities. Table 7 displays regression weights between clinically-relevant variables and each motivation for sex for each ethnic group. Chi-square difference tests for regression weights between the LSFI and Love, Partner Pleasing, Physical



Desirability, Pleasure, and Stress Reduction motivations were significant ( $p$ -values  $< .05$ ). Chi-square difference tests for regression weights between the GMSEX and the motivations of Partner Pleasing and Pressured Compliance were significant ( $p$ -values  $< .05$ ). Chi-square difference tests for regression weights between the DAS-7 and the motivations of Physical Desirability, and Pleasure were significant ( $p$ -values  $< .05$ ). No other chi-square difference tests of regression weights were significant ( $p$ -values  $> .05$ ). Table 8 displays chi-square difference tests.

### **Discussion**

The current study utilized confirmatory factor analytic techniques to examine a comprehensive set of motivations for sex (RQ1). This study examined ethnic differences in motivations for sex at the factorial (RQ2) and mean levels (RQ3). Lastly, this study examined the relationship between motivations for sex and clinically-relevant outcomes (RQ4), and compared these relationships across the four largest ethnic groups in the U.S (RQ5).

The current study represents one of the first confirmatory factor analyses of a comprehensive list of motivations for sex. Previously, literature had either examined motivations for sex utilizing confirmatory techniques with a relatively small number of motivations (e.g., Cooper et al., 1998) or had examined a comprehensive set of motivations with exploratory techniques (e.g., Browning, 2004). The current study included all six motivations that had previously been supported through confirmatory techniques. These six motivations – in this study referred to as Love, Partner Pleasing, Pleasure, Pressured Compliance, and Role Fulfillment – also represent the motivations for sex most often included in other measures. In addition to these six, 15 motivations that had not previously been examined with confirmatory techniques were added. Although model fit was not ideal, the present data support expanding to include 21 distinct motivations for sex: Dominance, Experimentation, Financial, Love, Making

Amends, Mate Guarding, Partner Pleasing, Peer Conformity, Physical Desirability, Pleasure, Pressured Compliance, Procreation, Rebellion, Recognition, Revenge/Jealousy, Role Fulfillment, Safety, Spirituality, Stress Reduction, Submission, and Utilitarian. Each motivation appeared to form a distinct group, as all items fit best on their proposed factor, even the items which were removed. Additionally, cross-loading items and correlating error terms gained negligible model fit. Instead, factor correlations appeared account for the relations between motivations for sex. Taken together, evidence from CFA in Step 1 supports a comprehensive set of at least 21 theoretically distinct motivations for sex.

### **Relations with Clinically-Relevant Variables**

This study is also among the first to examine the relations between motivations for sex and clinically-relevant sexual and relationship variables. Prior studies had examined relations between motivations for sex, sexual history, and risky sexual behavior (e.g., Cooper et al., 1998). The current study, however, found relations between motivations for sex and other clinically-relevant variables. Specifically, multiple motivations for sex significantly predicted sexual dysfunction in expected directions. It appeared self- and relationship-enhancement motivations positively predicted sexual and relationship satisfaction, and negatively correlated with sexual dysfunction. For example, Love and Pleasure motivations positively predicted sexual and relationship satisfaction variables while relating negatively with sexual dysfunction. This largely corroborates anecdotal evidence from clinical work and fits with proposed mechanisms of action for sexual dysfunction treatment. Specifically, focusing on one's own pleasure and relationship-enhancement during sex has been proposed as a key factor in maintaining sexual functioning and improving sexual functioning during treatment (Leiblum & Rosen, 1992; Masters & Johnson, 1970; Heiman & Meston, 1992). Since the development of *Sensate Focus* (Masters & Johnson, 1970), clinicians and researchers have speculated that focusing on relationship enhancement

during sexual contact improves intimacy, making sex more enjoyable, and deters attentional focus from potential sexual performance deficits. A similar focus on pleasurable aspects of sex has been proposed to improve sexual functioning by shifting attention to positive components of sexual contact and away from potential negative expectations (e.g., performance concerns). The current study provides further evidence for this relationship between focusing on relationship- and pleasure-enhancement during sex and sexual functioning.

Conversely, focusing on negative aspects of the relationship and sexual experience (e.g., relationship dissatisfaction or sexual performance anxiety) has been proposed to interfere with sexual functioning and sexual satisfaction (Leiblum & Rosen, 1992; Masters & Johnson, 1970; Heiman & Meston, 1992). This may provide one explanation for the relations found in the current study between sexual dysfunction, sexual satisfaction and motivations such as Mate Guarding or Pressured compliance. In both Mate Guarding and Pressured Compliance motivations, individuals engage in sex in order to avoid negative relationship consequences. In the case of Mate Guarding motivations, an individual engages in sexual contact in order to prevent a partner from leaving the relationship or being unfaithful (e.g., “Because I wanted to prevent a breakup”). The Pressure Compliance motive involves engaging in sex in order to prevent relationship discord (e.g., “Because my partner gets angry with me if I don’t”). Thus, for both motivations an individual focuses on the negative aspects of the relationship and engages in sex in order to avoid these negative aspects. Results from the current study suggest a negative focus relates positively with sexual dysfunction and negatively with sexual satisfaction.

Relations between motivations for sex and other sexual variables must be considered in the contexts of the relationships in which they occur. For example, women who experience domestic violence in their relationships very often report having little control over sexual timing (e.g., Lichtenstein, 2005). In such a relationship, partner behavior would appear to play a large

role in focusing on negative relationship outcomes during sex and reduced positive experiences during sex. As a result, relationship and contextual factors need to be better understood in order to understand the relations between motivations for sex and clinically-relevant variables. Results from the current study also support the importance of contextual factors in the relations between motivations for sex and clinically-relevant variables. Many of the correlations found in the overall sample varied between ethnic groups. These differences are discussed in greater detail later, but differences suggest ethnic comparisons may provide a starting point for better understanding motivations for sex and their relations with other variables.

### **Ethnic Differences in Motivations for Sex**

The sample and methodology used in this study allowed for three important types of comparisons of motivations for sex across the four largest ethnic groups in the U.S.: (1) Comparisons of factor structure, (2) average endorsement of each motivation, and (3) differences in relations to clinically-relevant outcomes. Each provides a substantially different insight into how motivations for sex may vary. Previous investigations of ethnocultural variability have largely examined ethnic differences in the average endorsement of each motivation (Browning, 2004; Tang, 2010, Tang et al., 2012). Mean comparisons, however, have been limited in revealing important ethnocultural differences. For example, multiple motivations were only proposed after utilizing qualitative methodologies with diverse samples (e.g., Spirituality; Browning, 2004). Thus, factor loading differences and differences in relations with clinically-relevant variables represent novel additions to the current literature on motivations for sex.

In examining the three types of comparisons made in this study, most motivations for sex – 15 of the 21 – evidence some sort of variability across ethnic groups. Table 9 summarizes the type of variability that was found for each motivation, and the motivations that did not display any variability. Six motivations (Experimentation, Making Amends, Mate Guarding,

Recognition, Safety, and Submission) evidenced no variability across ethnicities. None of the core six motivations consistently found in previous literature (Love, Partner Pleasing, Pleasure, Pressured Compliance, Role Fulfillment, and Stress Reduction) were consistent across ethnic groups, although all of these motives were ethnically invariant, indicating they represent similar constructs across ethnic groups.

Differences found in the current study are highly congruent with results from other work as nearly all of the factors shown to vary in prior work evidenced some degree of ethnic variability in the current study. Most notably, Browning (2004) had previously found ethnic differences in all six factors taken from the COSMIC that were found to have ethnic differences in factor loadings in the current study. Only mean differences, however, had been examined previously for the six factors. Mean differences for these factors were not explored in the current study, as differences in factor loadings suggest these factors take on different meanings across ethnic groups and mean comparisons would be difficult to interpret.

**Factor loading differences.** Factor loading differences were the largest source of variations in motivations for sex with one-third of the total factors found to be ethnically variant: Peer Conformity, Procreation, Spirituality, Utilitarian, Financial, Rebellion, and Revenge/Jealousy. This suggests that a large portion, although a minority, of sexual motives may take on different meanings across ethnic groups. As a result, interpretations regarding one third of the motivations may not be applied across ethnicities. That is, mean differences or correlations may not convey the same meaning across ethnic groups.

As one example of ethnic invariance, the item related to engaging in sex as expected in a “love relationship” did not load onto the Role Fulfillment factor for Asian Americans as it did among other ethnic groups. It was also the lowest loading items for Asian Americans. The highest loading Role Fulfillment item for Asian Americans, who were the group with the highest

factor loading for this item, referred to engaging in sex as an “obligation as a spouse.” These findings are largely consistent with research on Asian American cultural values. Specifically, humility and conformity are often seen as highly valued among most Asian American cultures (Kim, Atkinson, & Yang, 1999; Kim, Yang, Atkinson, Wolfe, & Hong, 2001). These values entail attending first to others’ needs and fulfilling family obligations (Kim, 1999). The conformity value also entails more than adhering to broader societal or peer group norms, but adhering to family expectations. Limiting displays of strong emotion appears to also be of great importance among Asian American cultural groups (Kim et al., 1999; Kim et al., 2001). As a result, fulfilling obligations may play a much larger role in fulfilling familial roles compared to expressing love.

In another example, the item related to seeking revenge did not load as highly onto the Revenge/Jealousy motivation for African American participants as it did for other ethnic groups. Specifically, the factor loading for seeking revenge among African Americans was the lowest Revenge/Jealousy item across all ethnicities ( $\lambda = .40$ ). All other loadings were notably higher ( $\lambda$ -values  $> .60$ ). Instead, the highest Revenge/Jealousy factor loadings for African Americans pertained to inducing jealousy. This may suggest that revenge and jealousy induction represent distinct motivations for African Americans, and may combine to form a single motivation among the other three ethnic groups. In essence, this may mean that using extra-relational sex to injure another may represent something distinct from engaging in sex to try to gain back a partner among African Americans. The distinction between the two potential motives is supported by previous literature that infidelity and dissolution of the relationship is more common among African Americans when compared to Anglo Americans (Penn, Hernandez, & Burmudez, 2007). Some have traced this tendency to roots of slavery and slave owning practices of preventing marriages, intentionally dissolving relationships that do form, raping women slaves,

and using men as breeders (Patterson, 1998; Penn et al., 2007). Such factors may contribute to greater relationship tumult for African Americans when compared to other groups who do not have a history of slavery in the U.S. With relationship dissolution more likely, using sex as a means for inducing jealousy may take on a different meaning from using sex as a form of revenge during relationship dissolution.

**Mean differences.** With regard to mean differences in motivations for sex for the factors found to be invariant across all ethnic groups, many previously found mean differences among Anglo Americans and Asian Americans in motivations for sex (Browning, 2004; Tang et al., 2012) were not replicated. This appears to be largely due to the overlap in the factors found to be variant in the current study and those with previously found mean differences. Mean differences were not examined in the current study for variant factors. Nevertheless, results support previously literature as six of the seven factors with ethnic differences in factor loadings had previously been found to vary between ethnic groups (Browning, 2004). The seventh factor found to be invariant was derived from the YSEX, for which ethnic comparisons are not available (Meston & Buss, 2007).

Despite much of the overlap with previous literature, the current study failed to replicate multiple ethnic differences from other work (Browning, 2004; Tang et al., 2013). Specifically, Asian Americans had been found to endorse greater degree of other-focused motives (e.g., Submission) and lower degrees of self-focused motives (e.g., Pleasure) when compared to Anglo Americans (Browning, 2004). These differences were not replicated in the current study. The differences between this study and prior works may result from significant sampling differences. For the current study, all participants were recruited online, whereas both prior studies recruited participants in person. The current study required that participants have access to and sufficient knowledge of the internet to find and complete the study. Socioeconomic status (SES) was not

assessed in the current study, but such knowledge of and access to the internet may have resulted in a more homogeneous sample with respect to SES or other relevant sociodemographic factors (e.g., education) when compared to samples used in prior studies of motivations for sex (Browning, 2004; Tang et al., 2012). The regional differences in recruitment may have also contributed to the differences between the current findings and that of previous work. In one prior study, 21.3% of participants were immigrants from Asia and 17.4% were Asian American (Browning, 2004). Immigration status was not assessed in the current study, but all participants had to know English sufficiently well to complete the survey while demonstrating careful responding. Nevertheless, the relatively high proportion of immigrants in prior work may have contributed to larger ethnic differences.

Among mean differences that were found, African American participants endorsed Role Fulfillment motivations more than participants from the other three ethnic groups. Although no ethnic differences were found in prior work examining the Role Fulfillment motivation (Browning, 2004), the sample from that study did not include a substantial enough proportion of African Americans to allow for comparisons. African Americans may endorse Role Fulfillment motivations more than other ethnic groups due to placing a higher importance sex and sexual satisfaction within a romantic relationship when compared to those of other ethnic groups (Cain et al., 2004). The higher importance placed on sex in a relationship may make sexual contact more vital to fulfilling one's role in a romantic relationship and for preserving relationship satisfaction.

Importantly, even with ethnic mean differences found in the current study, the majority of factors appear consistent across ethnicities. The four ethnic groups included in this study appear similar in the content and degree of 12 motivations for sex. Said differently, data from this study suggest individuals from the four largest ethnic groups in the U.S. engage in sex largely for



similar reasons. Although a lack of evidence for ethnic differences is not equivalent to finding evidence for sameness, this study suggests individuals, for the most part, do not vary tremendously in their reasons for engaging in sex on the basis of ethnicity. This finding is tempered by recruitment methodology, as exclusively internet-based recruitment may have contributed to a more homogenized sample and not allowed for ethnic differences to emerge. Future work should prioritize representative sampling across ethnic groups in the U.S. to allow for greater sampling diversity.

**Differences in relations with clinically-relevant variables.** Although factors themselves appear largely consistent, the implications of each factor (i.e., the relations with other variables) differ significantly across ethnic groups. In total, 6 of the 14 ethnically invariant motivations for sex displayed differences in the relations with other variables, including relations supporting many of the proposed mechanisms of action in sexual dysfunction treatment. Specifically, the relations between sexual dysfunction and Love, Mate Guarding, and Pressured Compliance varied across ethnic groups. Making Amends and Pressured Compliance appeared to positively relate to sexual dysfunction, but not as negatively across all ethnic groups. Similarly, Love negatively predicted sexual dysfunction across all ethnic groups, but the relation varied in magnitude and direction. Specifically, the relation was negative among Anglo Americans and Latinos, but was positive, although small ( $\gamma < .10$ ), among African Americans and Asian Americans.

The relations between sexual dysfunction and Love, Making Amends, and Pressured Compliance were all weakest among Asian Americans. This suggests the proposed mechanisms for action for sexual dysfunction treatment may be weaker among Asian Americans. It is unclear why these relations differ; however, cultural differences between Asian Americans and the other three ethnic groups may provide some insight. In addition to aspects of humility and conformity

described previously, these values involve placing a high priority on others' needs and maintaining familial harmony (Kim, 1999). The conformity value also entails more than adhering to broader societal or peer group norms, but adhering to family expectations. As a result, engaging in sex as a means of maintaining relationship harmony (i.e., Pressured Compliance) and stability (i.e., Mate Guarding) may not be interpreted as negatively among Asian American cultural groups. In comparison to other ethnic groups, the less negative implications of Pressured Compliance may result in a weaker relation with sexual dysfunction.

Cultural differences may also aid in understanding the weaker relation between Love and sexual dysfunction among Asian Americans when compared to other ethnic groups. Controlling and limiting one's emotional responses, even positive ones, has also been demonstrated as an important value among many Asian American groups (Kim et al., 1999; Kim et al., 2001). As such, using sex as a gesture of strong emotional attachment may not be viewed as positively. Focusing on expressing such a strong emotion may not be as positive in a sexual context for Asian Americans as for other ethnic groups.

There were several other relationships that also appeared ethnically variant when examining differences in regression weights. For example, the relation between Physical Desirability and sexual satisfaction appears much stronger among Asian Americans ( $\gamma = .31$ ) when compared to African Americans ( $\gamma = .03$ ; see Table 7). It is unclear why this discrepancy did not result in a significant chi-square difference test; however, inadequate sample size of individual ethnic minority groups may have diminished power to discover discrepancies among these groups.

### **Limitations and Future Directions**

Limitations temper many of the current study's findings. While the sample is more diverse than most others that have been used to examine the topic of motivations for sex, a large

majority of the sample was female. As a result, the study may better reflect motivations for sex among women. While the effect of gender was used as a control covariate for all correlational analyses, gender invariance was not explored in the current study. Prior work has demonstrated that some motivations for sex may apply equally to men and women (Cooper et al., 1998); however, this was completed with a limited set of motivations for sex. As such, relatively few of the motivations for sex presented here have been examined for gender invariance. Additionally, the sample was comprised of mostly Anglo Americans (51.6%). Covariance matrices would have largely been driven by relations among Anglo Americans. Given the relatively small number of participants from each ethnic minority group, departures of a single ethnic minority group from the relations of other groups would have resulted in only small changes in the overall covariance matrix. Constraining the groups to be equal in a case like this would not drastically alter model fit, as the constrained value would still very closely approximate the value for three groups comprising the overwhelming majority of the sample. Ethnic invariance tests may not have been as effective as a result of undersampling ethnic minority populations relative to Anglo American populations. This may have resulted in discrepancies between constrained and unconstrained values only being statistically significant when multiple ethnic groups' parameters are significantly different from that of Anglo Americans'. Additional discrepancies among ethnic minority groups may have been statistically significant with larger sample sizes of these populations. Future studies should prioritize equal sampling from multiple ethnic groups and from both genders.

Further, the current study, including recruitment, was conducted completely over the internet. This may have resulted in a highly educated (92.9% of the sample indicated having attended at least some college) sample. The entire sample had to have access to and knowledge of the internet in order to participate. As a result, participants may have been drawn largely from

high SES groups. This may have artificially homogenized the sample and masked many of the differences between ethnic groups. Samples with greater diversity may enhance the likelihood of finding ethnocultural differences in motivations for sex and allow for greater exploration of these differences.

Distinct from many other studies examining a comprehensive set of motivations for sex, this study did not allow for qualitative responses. This may have limited the diversity in observed motivations. Additionally, this may have limited participants' abilities to clarify or contextualize motivations. For example, individuals who engage in polyamorous relationships may simultaneously engage in sex for various motivations depending on the partner with whom they are interacting. Current methodology would not capture such motivations. In addition, the lack of qualitative methodologies constrains motivations for sex to only those contained within the study. Previous studies examining ethnocultural diversity uncovered additional motivations when qualitative approaches were included with diverse samples (Browning, 2004; Tang, 2010). By not including qualitative methodologies, the current study may have overlooked potentially important ethnocultural variability.

This study was also correlational and provides only preliminary evidence for the distinctiveness and ethnic invariance of a comprehensive list of motivations for sex. Experimental evidence regarding how to manipulate motivations for sex and how these motivations may impact other variables is still needed. For example, with the importance of partner-focused motives in sexual dysfunction treatment, and the positive relationship in this study between Partner Pleasing motivations and relationship satisfaction, experimental work related to enhancing partner-focused motives could be of great value. Applications of clinical techniques, such as motivation enhancement, could be explored as potential methods for enhancing partner-focused motives.

Given the exploratory nature of many analyses, caution must be exercised with interpretation. Despite efforts to compensate for family-wise error, examining as many regression coefficients and ANOVAs as were done may result in relations erroneously appearing as significant. Detailed theoretical and empirical work is needed to better understand the relations between motivations for sex and other sexual and romantic relationship variables.

Further, while it appears that lack of ideal model fit may have been the result of model complexity, it may also be an accurate reflection. Motivations may not represent coherent latent variable structures, as is represented in CFA. Instead, motivations may loosely cluster with one another enough to appear distinct. As a result, a CFA covariance structure may appear close to accurate, but not adequately capture some of the associations between some motivations for sex. Alternatively, different factor structures may also have been more appropriate and should be investigated in future studies.

A great deal of future research is needed to better understand motivations for sex. First, efforts should be made to better understand and validate the constructs themselves. The current study was only able to examine first-order constructs with all items loading on their previously hypothesized factors. Alternative model specifications, such as hierarchical models, should be examined to better determine the most appropriate theoretical model for motivations for sex. This may entail studies examining differences between motivations that are cues for sex (e.g., Physical Desirability) and motivations that are reinforcers (e.g., Pleasure). Hierarchical model structures such as that proposed by Cooper and colleagues (1998) may provide additional insights into how, if at all, the 21 motivations for sex group together. Additional, albeit more refined, studies like the current study may be useful in gaining fuller understanding of ethnocultural variability in motivations for sex and their relations to other variables. Longitudinal and experimental studies would aid in understanding the relation between

motivations for sex, and relationship and sexual functioning. Such inquiries may longitudinally track motivations over the course of a relationship or the lifespan. This may add insights into how motivations evolve as a result of the myriad factors that change through the course of a romantic relationship and the lifespan.

### **Conclusion**

In sum, the present study provides preliminary evidence for 21 distinct motivations for sex. Additionally, it appears that among the four largest ethnic groups in the U.S., individuals largely engage in sex for similar reasons. Ethnocultural variability does appear important, however, as significant differences exist in the content of many motivations for sex. Further, some ethnic groups appear to differ in the degree to which they endorse specific motivations. Nevertheless, participants from the four largest ethnic groups endorsed engaging in sex for largely similar reasons. Lastly, multiple motivations for sex may have important relations with clinically-relevant variables, but how motivations for sex relate to these variables may differ across ethnic groups.

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Figure 1.

*Original Factor Model from Cooper et al., 1998*

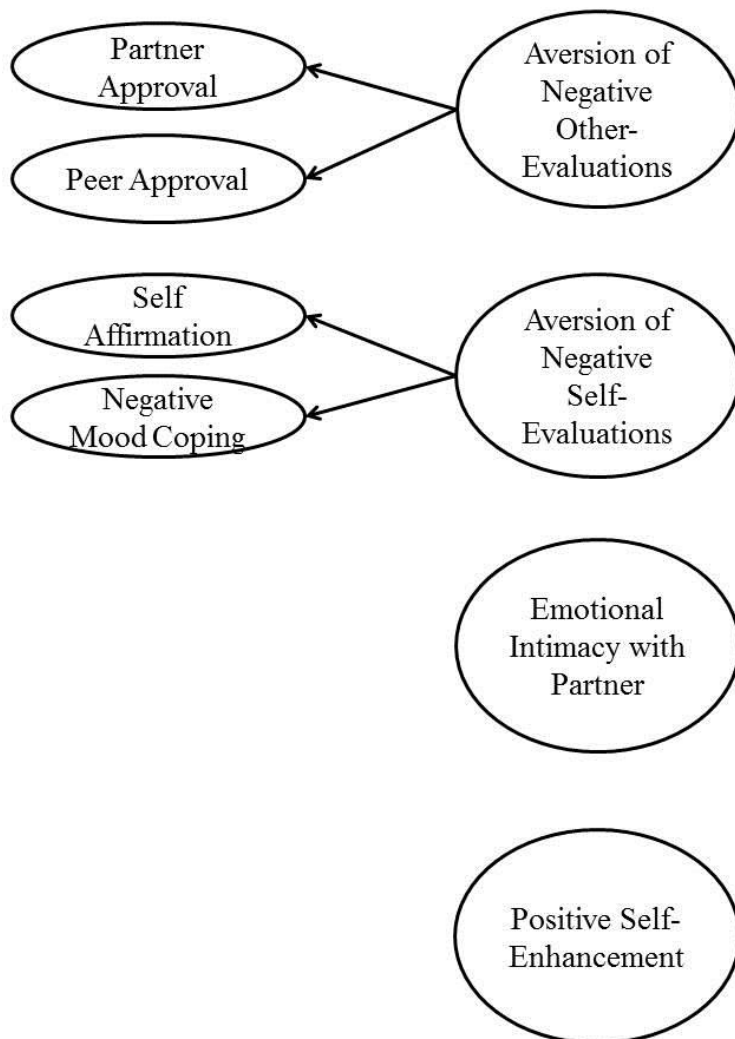
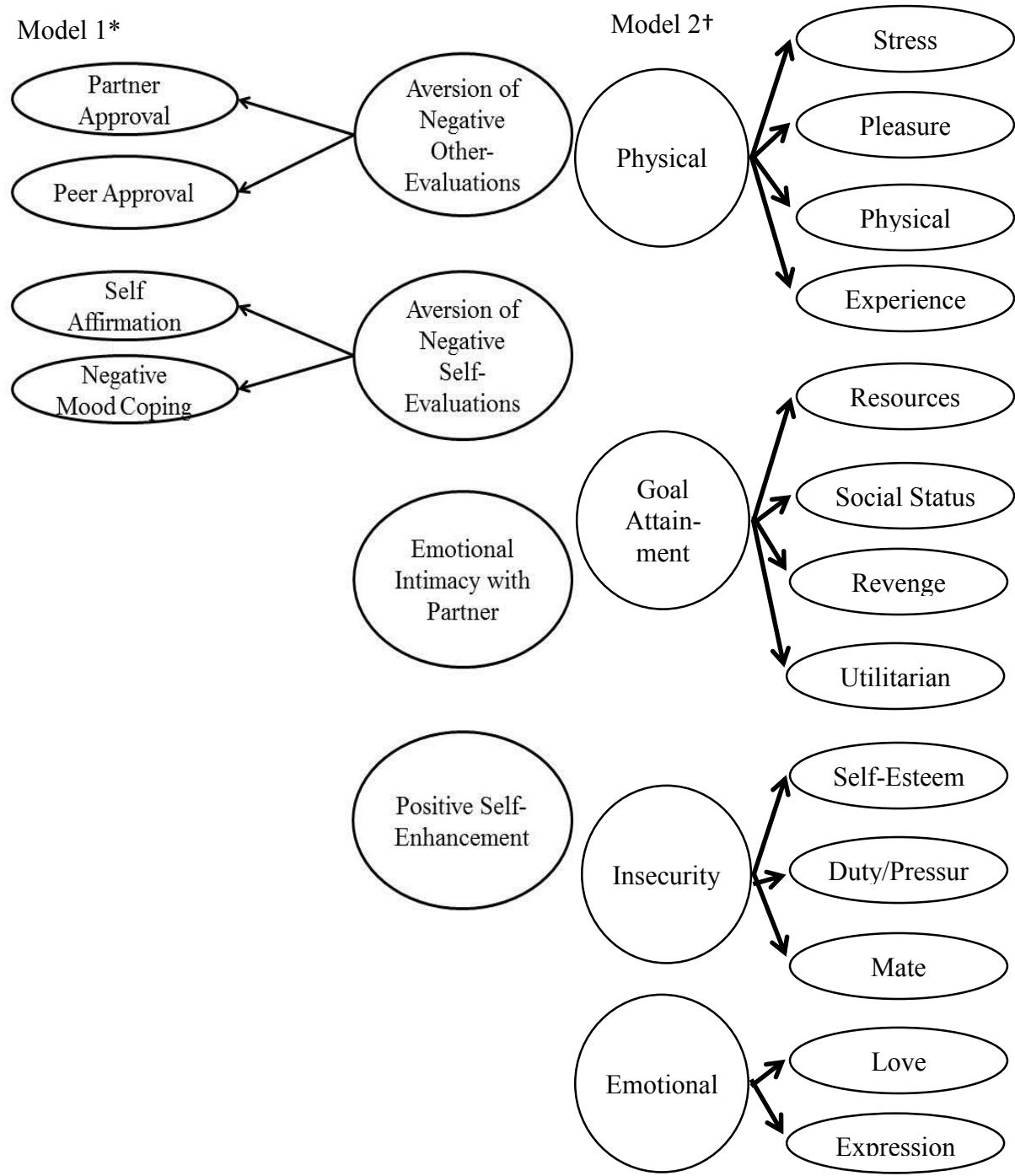


Figure 2.

Model Comparison of SMS and YSEX.



Note: \*Model taken from Cooper et al., 1998, †Model taken from Meston & Buss, 2007

Table 1.

*Distinct and Common Motivations for Sex Suggested by Different Scales.*

Motive	COSMIC (Browning, 2004)	YSEX (Meston & Buss, 2007)	SMS (Cooper et al., 1998)
Spirituality	X		
Dominance/Possession	X		
Rebellion	X		
Peer Conformity	X		X
Partner Pleasing	X		
Making Amends	X		
Procreation	X		
Love	X	X	X
Pleasure	X	X	X <sup>3</sup>
Recognition/Self- Affirmation	X	X	X
Experimentation/Exploration	X	X	
Submission	X	X	X
Stress Reduction	X	X	X
Safety/Protection	X	X <sup>1</sup>	
Revenge/Jealousy	X	X	
Role Fulfillment	X	X	
Pressured Compliance	X	X	
Financial Gain	X	X	
Physical Desirability		X	
Utilitarian Goals		X	
Mate Guarding		X	
Positive Emotional Enhancement	X <sup>2</sup>	X <sup>2</sup>	X <sup>3</sup>

Note: <sup>1</sup>This motive is included in the Utilitarian Goals motivation, although not all Utilitarian Goals are included in this motive on the SMS, <sup>2</sup>This motivation is subsumed under Love in the SMS and YSEX, <sup>3</sup>These motivations were combined to form a single Positive Self-Enhancement motive

Table 2.  
*Participant Demographic Information*

		<i>N</i>	<i>Percent</i>
<b>Gender</b>			
	Male	333	36.3%
	Female	582	63.5%
<b>Ethnicity</b>			
	African American	131	14.3%
	Anglo American	474	51.7%
	Asian American	118	12.9%
	Latino	194	21.2%
<b>Number of lifetime sexual partners</b>			
	1	173	18.9%
	2	80	9.1%
	3-4	146	16.6%
	5-6	97	11.0%
	7-9	97	11.0%
	10-12	64	7.3%
	13-15	46	5.2%
	16-18	23	2.6%
	19-21	16	1.8%
	22-24	14	1.6%
	25 or more	122	13.9%
<b>Frequency of sexual contact</b>			
	Once per day or more	42	4.8%
	4-5 times per week	124	14.1%
	2-3 times per week	273	31.0%
	Once per week	165	18.8%
	2-3 times per month	160	18.2%
	Once a month or less	116	13.2%
<b>Sexual orientation</b>			
	Members of opp. sex only	535	60.7%
	Mostly members of opp. sex	185	21.0%
	Equally attracted to both	101	11.5%
	Mostly members of same sex	25	2.8%
	Members of same sex only	36	4.1%

Table 2 cont.

		<i>N</i>	<i>Percent</i>
Highest level of education	Primary/elementary school	1	0.1%
	Middle school	2	0.2%
	Some high school	6	0.7%
	Graduated high school	56	6.1%
	Some college	189	20.6%
	Associate's degree	72	7.9%
	Bachelor's degree	171	18.6%
	Some graduate school	36	3.9%
	Graduate degree	103	11.2%
		<i>M</i>	<i>SD</i>
Age*	Total Sample	31.61	10.95
	African American	29.27	9.02
	Anglo American <sup>‡</sup>	34.44	11.99
	Asian American	27.79	6.78
	Latino	28.35	9.52
Number of years in current relationship*	Total Sample	5.84	7.33
	African American	4.56	5.26
	Anglo American <sup>‡</sup>	6.87	8.46
	Asian American	4.67	4.99
	Latino	4.79	6.20

Note: \*Significantly different across ethnic groups ( $p$ -values < .05); <sup>‡</sup>Anglo Americans were significantly older and in relationships significant longer than the other three ethnic groups.

Table 3  
*Descriptive Statistics of Clinically-Relevant Outcomes*

Variable	<i>M (SD)</i>	
<b>Average sexual dysfunction frequency</b>	Overall	0.87 (0.87)
	Af. Am. men	0.76 (0.71)
	Af. Am. women	0.93 (0.88)
	Anglo men	0.86 (0.87)
	Anglo women	1.00 (0.97)
	As. Am. men	0.56 (0.63)
	As. Am. women	1.00 (0.63)
	Latino men	0.73 (0.76)
	Latino women	0.99 (0.84)
<b>GMSEX</b>	Overall	28.95 (7.00)
	Af. Am. men	28.22 (8.15)
	Af. Am. women	29.46 (5.53)
	Anglo men	28.20 (7.33)
	Anglo women	28.75 (7.62)
	As. Am. men	30.00 (6.39)
	As. Am. women	28.82 (5.76)
	Latino men	29.53 (7.03)
	Latino women	29.73 (6.69)
<b>DAS-7</b>	Overall	25.28 (4.10)
	Af. Am. men	25.84 (4.45)
	Af. Am. women	24.41 (3.51)
	Anglo men	25.39 (4.23)
	Anglo women	25.31 (4.17)
	As. Am. men	26.62 (4.06)
	As. Am. women	25.11 (3.73)
	Latino men	25.09 (4.69)
	Latino women	25.20 (3.86)



Table 4  
*Descriptive Information of Variables Included in Study*

<b>Motivation for Sex Dominance</b>	<b><i>M (SD)</i></b>	<b>Factor loading</b>
“Because it increases the power I have in my relationship”	2.20 (1.35)	Overall = .63
		Af. Am. = .67
		Anglo Am. = .58
		As. Am. = .70
	Latino = .57	
<hr/>		
“Because it makes my partner mine”	2.73 (1.44)	Overall = .70
		Af. Am. = .62
		Anglo Am. = .71
		As. Am. = .78
		Latino = .70
<hr/>		
“Because it makes my partner open and vulnerable to me”	2.57 (1.36)	Overall = .67
		Af. Am. = .84
		Anglo Am. = .67
		As. Am. = .65
		Latino = .73
<hr/>		
“Because it enables me to strongly influence someone’s feelings and behavior”	1.79 (1.17)	Overall = .68
		Af. Am. = .55
		Anglo Am. = .65
		As. Am. = .62

Table 4 cont.

		Latino = .72
<b>Experimentation</b>		
	“Because I want to find out what turns me on”	2.79 (1.38)
		Overall = .73
		Af. Am. = .71
		Anglo Am. = .81
		As. Am. = .81
		Latino = .77
	“Because I want to discover something new about my	2.56 (1.37)
		Overall = .76
		Af. Am. = .68
		Anglo Am. = .84
		As. Am. = .67
		Latino = .74
	“Because I want to try sexual activities that I haven’t	2.69 (1.39)
		Overall = .81
		Af. Am. = .84
		Anglo Am. = .84
		As. Am. = .81
		Latino = .80
	“Because I want to learn new sexual techniques”	2.95 (1.33)
		Overall = .80
		Af. Am. = .64
		Anglo Am. = .58
		As. Am. = .80
		Latino = .66

Table 4 cont.

<b>Financial**</b>	
“Because it pays the bills”	1.17 (0.66)
	Overall = .78
	Af. Am. = .81
	Anglo Am. = .65
	As. Am. = .83
	Latino = .95
<hr/>	
“Because it supports my family”	1.23 (.73)
	Overall = .80
	Af. Am. = .68
	Anglo Am. = .74
	As. Am. = .87
	Latino = .82
<hr/>	
“Because I have no choice financially”	1.16 (.61)
	Overall = .91
	Af. Am. = .90
	Anglo Am. = .93
	As. Am. .88
	Latino = .95
<hr/>	
“Because it improves my financial situation”	1.18 (.64)
	Overall = .87
	Af. Am. = .82
	Anglo Am. = .86
	As. Am. = .96
	Latino = .87
<hr/>	
<b>Love</b>	
“Because my partner and I care a lot about each other”	4.23 (1.11)
	Overall = .63
	Af. Am. = .71

Table 4 cont.

		Anglo Am. = .76 As. Am. = .66 Latino = .69
<hr/>		
“Because it’s a way of expressing love”	4.18 (1.03)	Overall = .76 Af. Am. = .72 Anglo Am. = .84 As. Am. = .74 Latino = .74
<hr/>		
“Because it increases the love my partner and I have for	3.96 (1.17)	Overall = .79 Af. Am. = .75 Anglo Am. = .82 As. Am. = .73 Latino = .73
<hr/>		
“Because it deepens the relationship with my partner”	3.98 (1.04)	Overall = .75 Af. Am. = .65 Anglo Am. = .68 As. Am. = .60 Latino = .59
<hr/>		
<b>Making Amends</b>		
“Because it provides a way for me to make up for hurting my partner’s feelings”	1.83 (1.15)	Overall = .85 Af. Am. = .85 Anglo Am. = .87
<hr/>		

Table 4 cont.

	As. Am. = .80 Latino = .89
“Because it’s a way to show my partner I’m sorry for any wrong I’ve done”	1.81 (1.14) Overall = .84 Af. Am. = .75 Anglo Am. = .86 As. Am. = .94 Latino = .83
“Because it’s a way to compensate for disappointing my	1.69 (1.06) Overall = .68 Af. Am. = .52 Anglo Am. = .70 As. Am. = .74 Latino = .60
“Because it helps us make up after a fight”*	2.70 (1.39) Removed
<b>Mate Guarding</b>	
“Because I wanted to keep my partner from straying”	2.28 (1.35) Overall = .77 Af. Am. = .75 Anglo Am. = .79 As. Am. = .83 Latino = .74
“Because I wanted to decrease my partner’s desire to have sex with someone else”	2.00 (1.25) Overall = .71 Af. Am. = .80 Anglo Am. = .82

Table 4 cont.

	As. Am. = .82 Latino = .83
“Because I wanted to prevent a breakup”	1.58 (1.02) Overall = .73 Af. Am. = .71 Anglo Am. = .76 As. Am. = .64 Latino = .70
“Because I wanted to get my partner to stay with me”	1.92 (1.22) Overall = .82 Af. Am. = .74 Anglo Am. = .71 As. Am. = .70 Latino = .81
“Because I was afraid my partner would have an affair if I didn’t have sex with him/her”	1.79 (1.18) Overall = .80 Af. Am. = .80 Anglo Am. = .82 As. Am. = .81 Latino = .82
“Because I wanted to ensure the relationship was	2.56 (1.41) Overall = .71 Af. Am. = .68 Anglo Am. = .66 As. Am. = .73 Latino = .70
“Because I didn’t want to “lose” the person”	1.94 (1.20) Overall = .84

Table 4 cont.

			Af. Am. = .83 Anglo Am. = .88 As. Am. = .83 Latino = .85
	“Because I wanted the person to love me”*	2.41 (1.42)	Removed
	“Because I thought it would help “trap” a new partner”*	1.27 (0.78)	Removed
<b>Partner Pleasing</b>			
	“Because it makes my partner happy”	4.07 (0.98)	Overall = .67 Af. Am. = .68 Anglo Am. = .65 As. Am. = .62 Latino = .77
	“Because it makes my partner feel good”	4.11 (0.99)	Overall = .76 Af. Am. = .81 Anglo Am. = .78 As. Am. = .77 Latino = .71
	“Because my partner really appreciates it”	3.78 (1.20)	Overall = .75 Af. Am. = .73 Anglo Am. = .75 As. Am. = .74 Latino = .75
	“Because I want to please my partner”	3.96 (1.14)	Overall = .72 Af. Am. = .55

Table 4 cont.

			Anglo Am. = .71
			As. Am. = .80
			Latino = .80
<b>Peer Conformity**</b>			
	“Because people will tease me if I don’t”	1.21 (0.67)	Overall = .78
			Af. Am. = .49
			Anglo Am. = .70
			As. Am. = .81
			Latino = .94
	“Because if I don’t people will think there’s something wrong with me”	1.47 (0.94)	Overall = .67
			Af. Am. = .48
			Anglo Am. = .64
			As. Am. = .77
			Latino = .66
	“Because I want the approval of my friends”	1.25 (0.75)	Overall = .88
			Af. Am. = .89
			Anglo Am. = .87
			As. Am. = .95
			Latino = .86
	“Because I’m afraid the people I hang out with will put me down otherwise”	1.26 (0.72)	Overall = .81
			Af. Am. = .86



Table 4 cont.

			Anglo Am. = .80 As. Am. = .82 Latino = .80
<b>Physical Desirability</b>			
	“Because the person had an attractive face”	3.13 (1.27)	Overall = .82 Af. Am. = .66 Anglo Am. = .74 As. Am. = .72 Latino = .70
	“Because the person had a desirable body”	3.60 (1.19)	Overall = .76 Af. Am. = .67 Anglo Am. = .80 As. Am. = .72 Latino = .74
	“Because the person had beautiful eyes”	2.99 (1.37)	Overall = .64 Af. Am. = .53 Anglo Am. = .67 As. Am. = .70 Latino = .60
	“Because the person’s physical appearance turned me on”	3.72 (1.18)	Overall = .76 Af. Am. = .69 Anglo Am. = .80 As. Am. = .72

Table 4 cont.

			Latino = .77
	“Because I saw the person naked and could not resist”	2.58 (1.48)	Overall = .71
			Af. Am. = .71
			Anglo Am. = .68
			As. Am. = .76
			Latino = .73
	“Because the person was too physically attractive to resist”	2.74 (1.41)	Overall = .82
			Af. Am. = .88
			Anglo Am. = .77
			As. Am. = .82
			Latino = .85
	“Because the person was too “hot” (sexy) to resist”	2.86 (1.42)	Overall = .80
			Af. Am. = .89
			Anglo Am. = .83
			As. Am. = .85
			Latino = .89
	“Because the person smelled nice”*	2.58 (1.29)	Removed
	“Because the person was a good dancer”*	1.52 (0.97)	Removed
	“Because the person wore revealing clothes”*	1.88 (1.24)	Removed
<b>Pleasure</b>			
	“Because I enjoy it a lot”	4.40 (0.89)	Overall = .80
			Af. Am. = .78
			Anglo Am. = .82
			As. Am. = .87

Table 4 cont.

	“Because it feels so good”	4.32 (0.92)	Latino = .68 Overall = .84 Af. Am. = .82 Anglo Am. = .87 As. Am. = .79 Latino = .81
	“Because it’s physically pleasurable”	4.33 (1.01)	Overall = .76 Af. Am. = .55 Anglo Am. = .85 As. Am. = .60 Latino = .77
	“Because it’s exciting”*	4.06 (1.03)	Removed
<b>Pressured Compliance</b>	“Because otherwise my partner will be in a bad mood”	2.09 (1.23)	Overall = .73 Af. Am. = .69 Anglo Am. = .72 As. Am. = .69 Latino = .71
	“Because my partner bugs me until I do”	1.91 (1.18)	Overall = .80 Af. Am. = .76 Anglo Am. = .82 As. Am. = .76 Latino = .81

Table 4 cont.

“Because my partner will be angry if I don’t”	1.69 (1.07)	Overall = .82
		Af. Am. = .72
		Anglo Am. = .85
		As. Am. = .79
		Latino = .81
“Because my partner pressures me to”	1.61 (1.03)	Overall = .80
		Af. Am. = .79
		Anglo Am. = .86
		As. Am. = .79
		Latino = .79
<b>Procreation**</b>		
“Because I want to have a baby”	1.73 (1.23)	Overall = .93
		Af. Am. = .97
		Anglo Am. = .96
		As. Am. = .90
		Latino = .93
“Because I want to bring a new life into the world”	1.71 (1.24)	Overall = .93
		Af. Am. = .97
		Anglo Am. = .92
		As. Am. = .92
		Latino = .90
“Because I want a baby”	1.68 (1.21)	Overall = .96
		Af. Am. = .89
		Anglo Am. = .97

Table 4 cont.

	As. Am. = .98 Latino = .98
“Because I want to be a mother (father)”	1.65 (1.20) Overall = .94 Af. Am. = .85 Anglo Am. = .96 As. Am. = .91 Latino = .94
<b>Rebellion**</b>	
“Because it’s forbidden”	1.51 (0.98) Overall = .59 Af. Am. = .56 Anglo Am. = .53 As. Am. = .63 Latino = .64
“Because people tell me not to”	1.31 (0.86) Overall = .91 Af. Am. = .93 Anglo Am. = .92 As. Am. = .97 Latino = .89
“Because people try to prevent me from doing so”	1.25 (.72) Overall = .88 Af. Am. = .91 Anglo Am. = .88 As. Am. = .86 Latino = .87
“Because other people say we shouldn’t”	1.28 (0.81) Overall = .86

Table 4 cont.

			Af. Am. = .77
			Anglo Am. = .87
			As. Am. = .90
			Latino = .84
<b>Recognition</b>			
	“Because I want people to think of me as attractive”	2.39 (1.32)	Overall = .71
			Af. Am. = .67
			Anglo Am. = .69
			As. Am. = .65
			Latino = .81
	“Because I want people to consider me sexy”	1.97 (1.20)	Overall = .86
			Af. Am. = .84
			Anglo Am. = .88
			As. Am. = .85
			Latino = .90
	“Because I want people to see me as sexually desirable”	1.95 (1.23)	Overall = .86
			Af. Am. = .75
			Anglo Am. = .88
			As. Am. = .83
			Latino = .81
	“Because it improves my self-concept”*	2.10 (1.27)	Removed
<b>Revenge/Jealousy*</b>			
*			

Table 4 cont.

“Because when done with another person it shows my regular partner how it feels to be replaced by someone else”	1.24 (0.74)	Overall = .86
		Af. Am. = .80
		Anglo Am. = .83
		As. Am. = .84
		Latino = .83
“Because it’s a way to get revenge”	1.31 (0.81)	Overall = .71
		Af. Am. = .40
		Anglo Am. = .68
		As. Am. = .61
		Latino = .88
“Because sexual activity with another person gets my partner to stop taking me for granted”	1.31 (0.82)	Overall = .77
		Af. Am. = .65
		Anglo Am. = .88
		As. Am. = .87
		Latino = .68
“Because having sex with someone else teaches my partner a lesson”	1.35 (0.88)	Overall = .71
		Af. Am. = .67
		Anglo Am. = .73
		As. Am. = .65
		Latino = .81

Table 4 cont.

<b>Role Fulfillment**</b>	
“Because it is a couple’s responsibility to give each other sexual satisfaction”	3.25 (1.32)  Overall = .72 Af. Am. = .74 Anglo Am. = .68 As. Am. = .76 Latino = .69
“Because it is required in a committed relationship”	2.62 (1.39)  Overall = .84 Af. Am. = .79 Anglo Am. = .84 As. Am. = .90 Latino = .80
“Because it’s my obligation as a spouse or love partner”	2.86 (1.39)  Overall = .87 Af. Am. = .91 Anglo Am. = .87 As. Am. = .92 Latino = .87
“Because it is something I should do as a spouse or partner in a love relationship”	3.16 (1.29)  Overall = .63 Af. Am. = .66 Anglo Am. = .62 As. Am. = .59 Latino = .63
<b>Safety</b>	



Table 4 cont.	
“Because people don’t bother me verbally or physically when they know I have a protector”	1.62 (1.06) Overall = .69
<hr/>	
“Because my lover will prevent anyone from abusing me”	1.48 (1.04) Overall = .69
	Af. Am. = .48
	Anglo Am. = .70
	As. Am. = .65
	Latino = .81
<hr/>	
“Because no one will insult me with a lover by my side”	1.35 (0.86) Overall = .85
	Af. Am. = .89
	Anglo Am. = .87
	As. Am. = .86
	Latino = .85
<hr/>	
“Because people who might otherwise hassle me know they would have to answer to my lover”	1.30 (0.80) Overall = .81
	Af. Am. = .67
	Anglo Am. = .79
	As. Am. = .90
	Latino = .79
<hr/>	
<b>Spirituality**</b>	
“Because it leads me to have religious experiences”	1.29 (0.80) Overall = .87

Table 4 cont.

			Af. Am. = .83 Anglo Am. = .86 As. Am. = .85 Latino = .81
	“Because it can lead me to spiritual enlightenment”	1.55 (1.04)	Overall = .80 Af. Am. = .94 Anglo Am. = .81 As. Am. = .78 Latino = .84
	“Because it puts me in touch with my creator”	1.40 (0.94)	Overall = .78 Af. Am. = .67 Anglo Am. = .82 As. Am. = .88 Latino = .68
	“Because it increases my spiritual awareness”	2.18 (1.28)	Overall = .61 Af. Am. = .59 Anglo Am. = .62 As. Am. = .61 Latino = .65
<b>Stress Reduction</b>			
	“Because it reduces stress”	3.59 (1.17)	Overall = .67 Af. Am. = .60 Anglo Am. = .71 As. Am. = .61

Table 4 cont.

		Latino = .67
	“Because it mellows me out”	Overall = .76
		Af. Am. = .84
		Anglo Am. = .80
		As. Am. = .66
		Latino = .74
	“Because it eliminates nervous energy”	Overall = .69
		Af. Am. = .52
		Anglo Am. = .74
		As. Am. = .80
		Latino = .64
	“Because it provides an escape from the strains of life”	Overall = .71
		Af. Am. = .57
		Anglo Am. = .74
		As. Am. = .83
		Latino = .58
<b>Submission</b>		
	“Because during sex my partner gets me to give up all sense of control”	Overall = .70
		Af. Am. = .70
		Anglo Am. = .70
		As. Am. = .70
		Latino = .65
	“Because during sex I like it when my partner controls me”	Overall = .83

Table 4 cont.

			Af. Am. = .86
			Anglo Am. = .84
			As. Am. = .82
			Latino = .82
	“Because during sex my partner makes me feel	2.11 (1.32)	Overall = .85
			Af. Am. = .73
			Anglo Am. = .89
			As. Am. = .88
			Latino = .86
	“Because during sex my partner becomes dominant”	2.22 (1.32)	Overall = .80
			Af. Am. = .67
			Anglo Am. = .82
			As. Am. = .83
			Latino = .80
<b>Utilitarian**</b>			
	“Because I wanted to defy my parents”	1.32 (0.83)	Overall = .66
			Af. Am. = .43
			Anglo Am. = .71
			As. Am. = .68
			Latino = .65
	“Because I wanted to get a favor from someone”	1.36 (0.90)	Overall = .74
			Af. Am. = .45
			Anglo Am. = .71
			As. Am. = .72

Table 4 cont.

		Latino = .88
“Because I wanted to become more focused on work – sexual thoughts are distracting”	1.63 (1.04)	Overall = .57 Af. Am. = .48 Anglo Am. = .57 As. Am. = .67 Latino = .51
“Because I wanted to change the topic of conversation”	1.56 (0.99)	Overall = .72 Af. Am. = .72 Anglo Am. = .74 As. Am. = .70 Latino = .65
“Because I wanted to get rid of a headache”	1.65 (1.05)	Overall = .51 Af. Am. = .39 Anglo Am. = .59 As. Am. = .68 Latino = .45
“Because the person had taken me out for an expensive	1.46 (0.93)	Overall = 0.66 Af. Am. = .43 Anglo Am. = .69 As. Am. = .84 Latino = .59
“Because I wanted to get out of doing something”	1.76 (1.15)	Overall = .64 Af. Am. = .45

Table 4 cont.

		Anglo Am. = .69
		As. Am. = .79
		Latino = .65
“Because I wanted to burn calories”**	2.31 (1.29)	Removed
“Because I wanted to keep warm”**	2.06 (1.27)	Removed
“Because I thought it would help me to fall asleep”**	2.32 (1.34)	Removed

Note: \*Item was removed during model respecification; \*\*Factor was ethnically variant ( $p < .05$ )

Table 5  
*Ethnic Invariance Tests of Motivations for Sex Factors*

<b>Factor/Model</b>	$\chi^2$	df	<i>p-values</i>	$\chi^2/df$	CFI	SRMR	<b>RMSEA (90% CI)</b>
<b>Revenge/Jealous y<sup>‡</sup></b>							
Unconstrained	50.13	8	<.001	6.63	0.97	0.037	.076 (.057 - .097)
Constrained	90.04	17	<.001	5.30	0.96	0.039	.069 (.055-.083)
Difference	39.91	9	<.001				
<b>Mate guarding</b>							
Unconstrained	341.95	80	<.001	4.27	0.94	0.036	.060 (.053 - .066)
Constrained	363.08	101	<.001	3.59	0.94	0.037	.053 (.048 - .059)
Difference	21.13	21	.451				
<b>Physical</b>							
Unconstrained	140.26	20	<.001	7.01	0.95	0.050	.081 (.069 - .094)
Constrained	145.16	32	<.001	4.54	0.96	0.052	.062 (.052 - .073)
Difference	4.90	12	.961				
<b>Stress Reduction</b>							
Unconstrained	53.91	8	<.001	6.74	0.96	0.040	.079 (.060 - .100)
Constrained	64.28	17	<.001	3.78	0.96	0.040	.055 (.041 - .070)
Difference	10.37	9	.321				
<b>Rebellion<sup>‡</sup></b>							
Unconstrained	36.24	8	<.001	4.53	0.99	0.022	.062 (.043 - .083)
Constrained	54.35	17	<.001	3.20	0.98	0.026	.049 (.035-.064)
Difference	18.11	9	.034				
<b>Safety</b>							
Unconstrained	34.76	8	<.001	4.35	0.98	0.018	.061 (.041 - .082)
Constrained	40.67	17	<.001	2.39	0.98	0.021	.039 (.024 - .055)
Difference	5.91	9	.749				
<b>Dominance</b>							
Unconstrained	51.23	8	<.001	6.40	0.95	0.045	.077 (.058 - .098)
Constrained	62.03	17	<.001	3.65	0.95	0.045	.054 (.040 - .069)
Difference	10.80	9	.290				
<b>Financial<sup>‡</sup></b>							
Unconstrained	73.14	8	<.001	9.14	0.97	0.029	.094 (.075 - .115)
Constrained	181.22	17	<.001	10.66	0.94	0.051	.103 (.090 - .117)

Table 5 cont.

Difference	108.08	9	<.001				
<b>Partner Pleasing</b>							
Unconstrained	18.35	8	0.0187	2.29	0.99	0.009	.038 (.015 - .061)
Constrained	29.46	17	0.0305	1.73	0.99	0.015	.028 (.009 - .045)
Difference	11.10	9	0.269				
<b>Pressured Compliance</b>							
Unconstrained	35.35	8	<.001	4.15	0.98	0.023	.061 (.042 - .083)
Constrained	47.24	17	<.001	2.78	0.98	0.024	.044 (.030 - .059)
Difference	11.88	9	0.220				
<b>Utilitarian<sup>‡</sup></b>							
Unconstrained	164.56	56	<.001	2.94	0.95	0.047	.046 (.038 - .054)
Constrained	202.26	74	<.001	2.73	0.94	0.049	.044 (.036 - .051)
Difference	37.701	18	0.004				
<b>Submission</b>							
Unconstrained	34.41	8	<.001	4.30	0.99	0.008	.060 (.040 - .082)
Constrained	39.38	17	0.002	2.32	0.99	0.008	.038 (.023 - .054)
Difference	4.98	9	0.836				
<b>Spirituality<sup>‡</sup></b>							
Unconstrained	83.65	8	<.001	10.46	0.96	0.044	.102 (.083 - .122)
Constrained	106.26	17	<.001	6.25	0.95	0.043	.076 (.062 - .090)
Difference	22.61	9	0.007				
<b>Procreation<sup>‡</sup></b>							
Unconstrained	102.26	8	<.001	12.78	0.98	0.011	.114 (.095 - .134)
Constrained	130.97	17	<.001	7.70	0.98	0.011	.086 (.072 - .101)
Difference	28.71	9	0.001				
<b>Love</b>							
Unconstrained	30.56	8	<.001	3.82	0.98	0.014	.056 (.036 - .077)
Constrained	42.39	17	0.001	2.49	0.98	0.014	.040 (.025 - .056)
Difference	11.82	9	0.223				
<b>Peer Conformity<sup>‡</sup></b>							
Unconstrained	28.81	8	<.001	3.60	0.99	0.025	.053 (.033 - .075)
Constrained	73.55	17	<.001	4.33	0.97	0.026	.060 (.047 - .075)
Difference	44.74	9	<.001				



Table 5 cont.

<b>Role Fulfillment</b>							
Unconstrained	25.68	8	0.001	3.21	0.99	0.022	.049 (.029 - .071)
Constrained	32.47	17	0.013	1.91	0.99	0.024	.032 (.014 - .048)
Difference	6.79	9	0.659				
<b>Experimentation</b>							
Unconstrained	20.41	8	0.009	2.55	0.99	0.010	.041 (.019 - .064)
Constrained	31.32	17	0.018	1.84	0.99	0.011	.030 (.012 - .047)
Difference	10.91	9	0.282				
<b>Making Amends*</b>							
Unconstrained	75.21	52	0.019	1.45	0.99	0.041	.022 (.009 - .033)
Constrained	83.80	58	0.015	1.44	0.99	0.041	.022 (.010 - .032)
Difference	8.59	6	0.198				
<b>Pleasure*</b>							
Unconstrained	114.69	52	<.001	2.21	0.98	0.036	.036 (.027 - .045)
Constrained	120.41	58	<.001	2.08	0.98	0.030	.034 (.026 - .043)
Difference	5.72	6	0.455				
<b>Recognition*</b>							
Unconstrained	73.24	52	0.028	1.41	0.99	0.032	.021 (.007 - .032)
Constrained	79.73	58	0.031	1.37	0.99	0.032	.020 (.007 - .031)
Difference	6.49	6	0.370				

Note: ‡Factor was found to be ethnically variant ( $p < .05$ ); \*Factor was examined in conjunction with Partner Pleasing factor. Partner Pleasing factors loadings were not constrained.

Table 6  
*Ethnic Mean Differences in Motivations for Sex*

Motivation	$M_{\text{African American}}$ ( <i>SD</i> )	$M_{\text{Anglo American}}$ ( <i>SD</i> )	$M_{\text{Asian American}}$ ( <i>SD</i> )	$M_{\text{Latino}}$ ( <i>SD</i> )
Dominance*	2.09 (0.91)	1.76 <sup>‡</sup> (0.76)	1.99 (0.85)	1.95 (0.85)
Experimentation	2.91 (1.19)	2.69 (1.14)	2.65 (1.15)	2.85 (1.13)
Love	4.10 (0.86)	4.11 (0.89)	4.02 (0.88)	4.08 (0.86)
Making Amends	1.89 (1.02)	1.73 (0.93)	1.83 (1.03)	1.79 (0.95)
Mate Guarding	2.18 (1.10)	1.98 (0.93)	2.07 (1.00)	2.03 (1.01)
Partner Pleasing	4.08 (0.85)	3.98 (0.84)	3.87 (0.92)	3.97 (0.91)
Physical Desirability	2.61 (0.88)	2.70 (0.87)	2.71 (0.89)	2.65 (0.92)
Pressured Compliance	2.63 (1.07)	2.54 (1.07)	2.64 (1.19)	2.42 (1.02)
Pleasure	4.38 (0.78)	4.39 (0.82)	4.10 (0.87)	4.40 (0.78)
Recognition	1.99 (1.06)	2.15 (1.07)	2.17 (1.10)	2.01 (1.18)
Role Fulfillment*	3.31 <sup>†</sup> (1.19)	2.91 (1.08)	2.93 (1.16)	2.93 (1.10)
Safety	1.49 (0.70)	1.38 (0.73)	1.54 (0.82)	1.49 (0.88)
Stress Reduction	3.39 (1.06)	3.21 (1.02)	3.04 (1.04)	3.30 (1.04)
Submission	2.51 (1.21)	2.17 (1.13)	2.36 (1.17)	2.42 (1.17)

Note: \* $p$ -value less than Bonferroni corrected  $\alpha$ -value of .003, <sup>‡</sup>Anglo Americans endorsed Dominance motivations less than any other ethnic group –  $p$ -values < .05, <sup>†</sup>African American participants endorsed greater Role Fulfillment motivations than all other ethnicities –  $p$ -values < .05

Table 7  
*Regression Weights Predicting Clinically-Relevant Factors*

Motivation for Sex	Clinical Factor	Ethnicity	$\gamma$	Corrected $p$ -value* <sup>†</sup>
Dominance*	LSFI	Combined	.14	<.001
		Af. Am.	.17	
		Anglo. Am.	.17	
		Asian Am.	.08	
		Latino	.16	
Dominance	GMSEX	Combined	.03	.438
		Af. Am.	-.06	
		Anglo. Am.	<.01	
		Asian Am.	.17	
		Latino	.02	
Dominance	DAS-7	Combined	-.06	.182
		Af. Am.	-.14	
		Anglo. Am.	<.01	
		Asian Am.	-.07	
		Latino	-.13	
Experimentation	LSFI	Combined	.06	.126
		Af. Am.	.19	
		Anglo. Am.	.02	
		Asian Am.	<.01	
		Latino	.13	
Experimentation	GMSEX	Combined	.06	.098
		Af. Am.	.02	
		Anglo. Am.	.04	
		Asian Am.	.20	
		Latino	.03	
Experimentation	DAS-7	Combined	-.01	.862
		Af. Am.	-.05	
		Anglo. Am.	.05	
		Asian Am.	-.13	
		Latino	-.05	
Love*	LSFI	Combined	-.21	<.001
		Af. Am.	.07	
		Anglo. Am.	-.28	
		Asian Am.	.02	
		Latino	-.21	

Table 7 cont.

Love*	GMSEX	Combined	.47	<.001
		Af. Am.	.36	
		Anglo. Am.	.51	
		Asian Am.	.44	
		Latino	.43	
Love*	DAS-7	Combined	.44	<.001
		Af. Am.	.54	
		Anglo. Am.	.48	
		Asian Am.	.25	
		Latino	.30	
Making Amends*	LSFI	Combined	.20	<.001
		Af. Am.	.29	
		Anglo. Am.	.20	
		Asian Am.	.11	
		Latino	.23	
Making Amends*	GMSEX	Combined	-.10	.008
		Af. Am.	-.11	
		Anglo. Am.	-.15	
		Asian Am.	.08	
		Latino	-.10	
Making Amends*	DAS-7	Combined	-.13	.002
		Af. Am.	-.05	
		Anglo. Am.	-.12	
		Asian Am.	-.10	
		Latino	-.19	
Mate Guarding*	LSFI	Combined	.25	<.001
		Af. Am.	.34	
		Anglo. Am.	.27	
		Asian Am.	.18	
		Latino	.23	
Mate Guarding*	GMSEX	Combined	-.09	.013
		Af. Am.	-.12	
		Anglo. Am.	-.14	
		Asian Am.	.06	
		Latino	-.05	
Mate Guarding*	DAS-7	Combined	-.11	.005

Table 7 cont.

		Af. Am.	-.14	
		Anglo. Am.	-.07	
		Asian Am.	-.07	
		Latino	-.19	
Partner Pleasing	LSFI	Combined	-.03	.476
		Af. Am.	.13	
		Anglo. Am.	-.07	
		Asian Am.	.14	
		Latino	-.15	
Partner Pleasing*	GMSEX	Combined	.31	<.001
		Af. Am.	.08	
		Anglo. Am.	.38	
		Asian Am.	.38	
		Latino	.26	
Partner Pleasing*	DAS-7	Combined	.26	<.001
		Af. Am.	.18	
		Anglo. Am.	.33	
		Asian Am.	.17	
		Latino	.16	
Physical Desirability	LSFI	Combined	-.07	.076
		Af. Am.	<.01	
		Anglo. Am.	-.19	
		Asian Am.	-.06	
		Latino	.17	
Physical Desirability*	GMSEX	Combined	.14	<.001
		Af. Am.	.03	
		Anglo. Am.	.17	
		Asian Am.	.31	
		Latino	.11	
Physical Desirability*	DAS-7	Combined	.10	.026
		Af. Am.	.04	
		Anglo. Am.	.21	
		Asian Am.	-.07	
		Latino	.04	
Pleasure*	LSFI	Combined	-.22	<.001
		Af. Am.	-.11	
		Anglo. Am.	-.50	
		Asian Am.	-.19	

Table 7 cont.

Pleasure*	GMSEX	Latino	-.16	
		Combined	.45	<.001
		Af. Am.	.45	
		Anglo. Am.	.53	
		Asian Am.	.45	
Pleasure*	DAS-7	Latino	.38	
		Combined	.27	<.001
		Af. Am.	.36	
		Anglo. Am.	.39	
		Asian Am.	.04	
Pressured Compliance*	LSFI	Latino	.16	
		Combined	.35	<.001
		Af. Am.	.37	
		Anglo. Am.	.39	
		Asian Am.	.18	
Pressured Compliance*	GMSEX	Latino	.39	
		Combined	-.28	<.001
		Af. Am.	-.30	
		Anglo. Am.	-.34	
		Asian Am.	<.01	
Pressured Compliance*	DAS-7	Latino	-.26	
		Combined	-.23	<.001
		Af. Am.	-.34	
		Anglo. Am.	-.20	
		Asian Am.	-.22	
Recognition*	LSFI	Latino	-.32	
		Combined	.16	<.001
		Af. Am.	.06	
		Anglo. Am.	.17	
		Asian Am.	.11	
Recognition*	GMSEX	Latino	.25	
		Combined	-.10	.011
		Af. Am.	-.06	
		Anglo. Am.	-.13	
		Asian Am.	.11	
Recognition*	DAS-7	Latino	-.14	
		Combined	-.10	.023

Table 7 cont.

		Af. Am.	-.06	
		Anglo. Am.	-.02	
		Asian Am.	-.30	
		Latino	-.21	
Role Fulfillment*	LSFI	Combined	.20	<.001
		Af. Am.	.22	
		Anglo. Am.	.21	
		Asian Am.	.28	
		Latino	.18	
Role Fulfillment*	GMSEX	Combined	-.09	.019
		Af. Am.	-.09	
		Anglo. Am.	-.13	
		Asian Am.	.02	
		Latino	-.08	
Role Fulfillment	DAS-7	Combined	-.02	.610
		Af. Am.	-.03	
		Anglo. Am.	<.01	
		Asian Am.	<.01	
		Latino	-.04	
Safety*	LSFI	Combined	.09	.020
		Af. Am.	-.04	
		Anglo. Am.	.08	
		Asian Am.	<.01	
		Latino	.28	
Safety	GMSEX	Combined	<.01	.935
		Af. Am.	.05	
		Anglo. Am.	-.02	
		Asian Am.	.13	
		Latino	-.13	
Safety	DAS-7	Combined	-.07	.109
		Af. Am.	<.03	
		Anglo. Am.	-.04	
		Asian Am.	.04	
		Latino	-.22	
Stress Reduction*	LSFI	Combined	-.10	.011
		Af. Am.	.07	
		Anglo. Am.	-.20	
		Asian Am.	-.07	

Table 7 cont.

Stress Reduction*	GMSEX	Latino	.11	
		Combined	.17	<.001
		Af. Am.	.06	
		Anglo. Am.	.19	
		Asian Am.	.31	
Stress Reduction	DAS-7	Latino	.11	
		Combined	.06	.152
		Af. Am.	.03	
		Anglo. Am.	.13	
		Asian Am.	-.08	
Submission*	LSFI	Latino	.03	
		Combined	.08	.028
		Af. Am.	.06	
		Anglo. Am.	.06	
		Asian Am.	-.02	
Submission	GMSEX	Latino	.23	
		Combined	.06	.123
		Af. Am.	.06	
		Anglo. Am.	.05	
		Asian Am.	.08	
Submission	DAS-7	Latino	.02	
		Combined	-.05	.209
		Af. Am.	.03	
		Anglo. Am.	<.01	
		Asian Am.	-.12	
		Latino	-.15	

Note: \**p*-values corrected for non-normality using bootstrapped standard errors, †Bonferroni corrected  $\alpha$ -value = .001



Table 8  
*Ethnic Invariance Chi-Square Difference Tests of Regression Weights*

Motivation for Sex	Clinical Factor	$\chi^2_{diff}$	df <sub>diff</sub>	<i>p</i> <sub>diff</sub>
Dominance	LSFI	1.37	3	.713
	GMSEX	2.56	3	.465
	DAS-7	1.49	3	.685
Experimentation	LSFI	3.20	3	.362
	GMSEX	1.83	3	.609
	DAS-7	2.23	3	.527
Love	LSFI*	9.20	3	.027
	GMSEX	3.68	3	.298
	DAS-7	4.57	3	.206
Making Amends	LSFI	3.00	3	.392
	GMSEX	5.06	3	.168
	DAS-7	2.19	3	.535
Mate Guarding	LSFI	1.78	3	.620
	GMSEX	3.79	3	.284
	DAS-7	1.85	3	.605
Partner Pleasing	LSFI*	7.87	3	.049
	GMSEX*	10.87	3	.012
	DAS-7	6.97	3	.073
Physical Desirability	LSFI*	15.17	3	.002
	GMSEX	2.61	3	.455
	DAS-7*	8.72	3	.033
Pleasure	LSFI*	16.93	3	<.001
	GMSEX	5.14	3	.162
	DAS-7*	8.79	3	.032
Pressured Compliance	LSFI	3.80	3	.284
	GMSEX*	11.42	3	.009
	DAS-7	3.08	3	.380
Recognition	LSFI	1.78	3	.620
	GMSEX	4.80	3	.187
	DAS-7	5.53	3	.137
Role Fulfillment	LSFI	0.76	3	.859
	GMSEX	3.11	3	.376
	DAS-7	0.20	3	.978
Safety	LSFI	6.73	3	.081
	GMSEX	3.88	3	.275

Table 8 cont.

Safety	DAS-7	4.70	3	.196
Stress Reduction	LSFI*	11.77	3	.008
	GMSEX	2.03	3	.567
	DAS-7	3.81	3	.282
Submission	LSFI	4.49	3	.213
	GMSEX	0.22	3	.974
	DAS-7	2.94	3	.400

Note: \*Regression weight significantly differed between ethnic groups ( $p < .05$ )

Table 9  
*Summary of Sources of Ethnic Differences in Motivations for Sex*

Source of variability	Motive
Factor loadings	Financial Peer Conformity Procreation Rebellion Revenge/Jealousy Spirituality Utilitarian
Mean differences	Dominance <i>Role Fulfillment</i>
Relations with other variables	
Sexual Dysfunction	<i>Love</i> <i>Partner Pleasing</i> Physical Desirability <i>Pleasure</i> <i>Stress Reduction</i>
Sexual Satisfaction	<i>Partner Pleasing</i> <i>Pressured Compliance</i>
Relationship Satisfaction	Physical Desirability <i>Pleasure</i>
No variability	Experimentation Making Amends Mate Guarding Recognition Safety Submission

Note: Italics indicates motives from the core six motivations included in nearly all measures of motivations for sex

## Appendix A

### Description of Participant Recruitment Efforts

Significant effort was expended in order to recruit the current sample, particularly participants from ethnic minority groups. Recruitment began in February of 2013 through Amazon's MechanicalTurk service. The service allows for a recruiter, which is also called a requester, to limit the potential participants, also called workers, who can see a given advertisement. Limitations can be based on a number of parameters that MechanicalTurk tracks. For example, if participants perform poorly or fail to complete agreed upon assignments, their work may be rejected by the recruiter. Participants who complete a high percentage of assignments and provide quality responses to assignments may earn the designation of a "master worker." In order to view and participate in the screening portion of the study, participants were required to have a 90% success rate in completing assignments although they were not required to be "master workers." Periodically, the MechanicalTurk advertisement would be removed and replaced in order for the advertisement to appear more prominently to potential participants. The advertisement informed participants they would be presented with an initial survey and, if they qualified, they would be referred to another study. The initial survey served to screen participants for eligibility criteria. Participants were paid \$0.08 for completing the screening procedure and \$0.92 for completing the second portion of the study, which resulted in a total compensation of \$1.00 for participants who completed the entire study. A total of 1,585 participants were screened and 404 participants were recruited for the full study through MechanicalTurk. The majority of participants recruited were Anglo American ( $n = 254$ , 62.9%). A minority of participants recruited were African American ( $n = 63$ , 15.6%), Asian American ( $n = 34$ , 8.4%), and Latino ( $n = 53$ , 13.1%).

Additional recruitment strategies began in April of 2014 due to difficulties recruiting participants from ethnic minority groups through MechanicalTurk. In particular, recruitment efforts were expanded to include advertisements posted on internet classified advertisement websites (e.g., Craigslist). Advertisements were strategically placed in major metropolitan areas throughout the United States with high ethnic minority demographics. These included cities such as Atlanta, Detroit, Honolulu, Houston, Los Angeles, New York City, San Francisco, and Seattle. In May of 2013, recruitment was expanded a second time. Advertisements were then placed on social media websites (e.g., Facebook). These advertisements were targeted to participants who likely belonged to ethnic minority groups based on membership in social media groups related to specific ethnicities (e.g., social media groups that specifically mention belonging to Asian American groups). For both social media and internet classified advertisements, participants were informed they would complete an initial screening survey and, if they qualified, would be able to participate in a larger study for which they would be entered into one of four \$50 raffles. A total of 2,605 participants were screened and 519 participants were recruited for the full study through online classified and social media advertisements. A majority of participants (56.5%) recruited through these sources belonged to one of the three ethnic minority groups targeted for this study: African American ( $n = 68$ , 13.1%), Asian American ( $n = 65$ , 12.1%), and Latino ( $n = 160$ , 30.8%). A minority of participants recruited through internet classified and social media advertisements were Anglo American ( $n = 254$ , 63.9%).

For both recruitment sources, participants who qualified were provided with different links to the second portion of the study depending on their reported ethnicity and gender. This allowed for tracking of recruitment totals from each gender and ethnic group. Once the proposed

number of participants for a given group had been reached for the second portion of the study, future participants from that group were screened out through the survey software. Recruitment of Anglo American women was completed in May of 2013. Recruitment of all other groups continued until July of 2014 when all participant recruitment ended.

## Appendix B

Approval for Recruitment of Human Subjects from the University of Arkansas Institutional

Review Board

January 23, 2013

## MEMORANDUM

TO: Arthur Andrews III  
Ana Bridges

FROM: Ro Windwalker  
IRB Coordinator

RE: New Protocol Approval

IRB Protocol #: 13-01-406

Protocol Title: *Ethnocultural Differences in Motivations for Sex*

Review Type:  EXEMPT  EXPEDITED  FULL IRB

Approved Project Period: Start Date: 01/23/2013 Expiration Date: 01/22/2014

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Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (<http://vpred.uark.edu/210.php>). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

**This protocol has been approved for 4,800 participants.** If you wish to make *any* modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 210 Administration Building, 5-2208, or [irb@uark.edu](mailto:irb@uark.edu).