

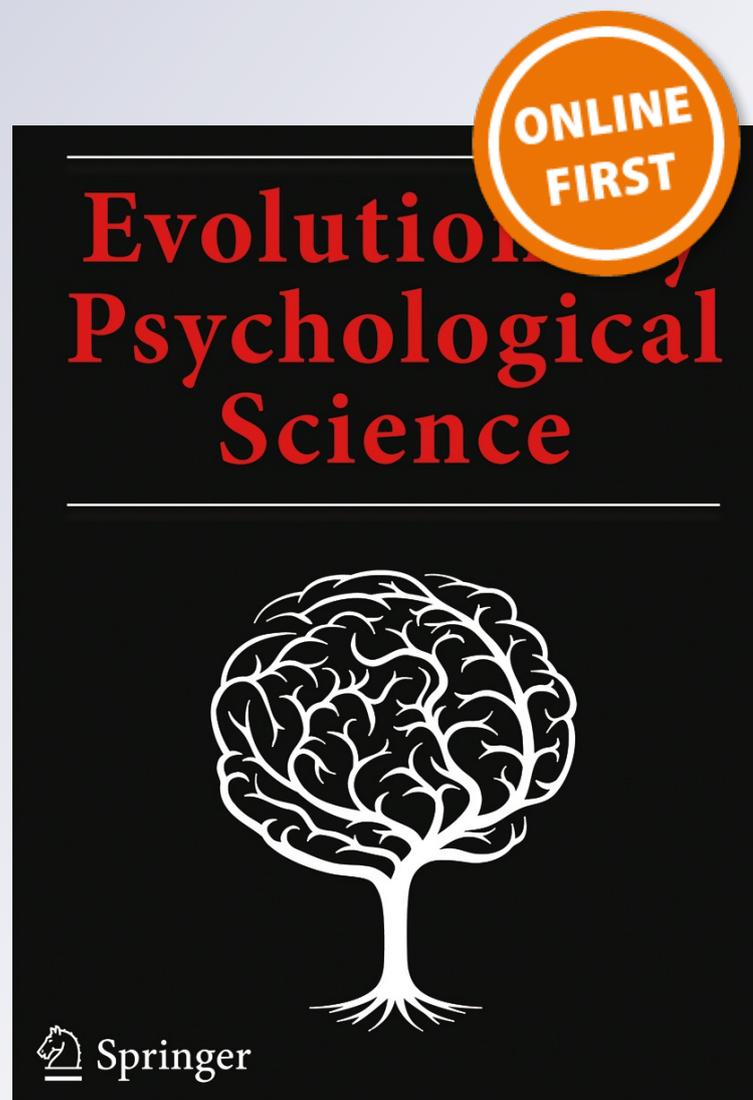
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Sex and Mating Strategy Impact the 13 Basic Reasons for Having Sex

Leif Edward Ottesen Kennair¹ · Trond Viggo Grøntvedt¹ · Mehmet Mehmetoglu¹ · Carin Perilloux² · David M. Buss³

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Abstract There is a large number of varied reasons for having sexual intercourse, ranging from sexual joy and pleasure to less frequent reasons such as wanting to hurt a person or feeling obliged to have sex with someone. The current paper investigated to what degree the reasons for having sex found by Meston and Buss are predicted systematically and independently by sexual strategies theory. The contribution of the paper is threefold: (1) the first reproduction of the factor structure found in the original study, (2) the reproduction in a more gender-egalitarian population investigates claims from social role theory, and (3) a novel set of contributions as preferred mating strategy and sex of respondents interact to predict reasons for having sex. We tested our predictions in a sample of 1372 students. The original factor structure was reproduced. Sex differences were abundant and showed mostly support for sexual strategies theory. Mating context also influenced reasons for having sexual intercourse in accordance with sexual strategies theory, rather than social role theory. The results are discussed with regard to both social role theory and sexual strategies theory, and the impact of studying reasons for sex in an egalitarian society.

Keywords Sexual motivation · Sexual strategies theory · Sex differences

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Introduction

Prior to Meston and Buss (2007; see also Meston & Buss, 2009), the scientific literature usually suggested that there were a limited number of reasons for having sex, such as pleasure and procreation (e.g., Hill and Preston 1996; Leigh 1989). Meston and Buss documented, through a nomination procedure, more than 200 unique reasons for having sex: from romantic, loving, relational reasons to colder, more utilitarian reasons, to unsavory reasons such as revenge, manipulation, and physical harm.

Based on this cache of data, Meston and Buss (2007) statistically organized the responses into 4 basic factors and 13 meaningful subfactors. The physical factor consisted of reasons related to relief of tension (*stress reduction*), pleasure (*pleasure*), the physical appearance of one's partner (*physical desirability*), and the improvement and practice of sexual skills (*experience seeking*). The second factor, goal attainment, consisted of reasons related to obtaining objects or reaching goals (*resources*), concerns about peers and social reputation (*social status*), the desire to hurt someone (*revenge*), and wishing to achieve an advantage (*utilitarian*). The third factor, emotional, consisted of reasons related to maintaining and increasing attachment with one's partner (*love and commitment*) and reasons related to communication with one's partner (*expression*). The final factor, insecurity, consisted of reasons related to feelings of confidence and power (*self-esteem boost*), feelings of obligation to or coercion from one's partner (*duty/pressure*), and the use of sex to prevent losing one's partner (*mate guarding*).

There are three aims to this study: (1) reproduction (given current concerns about the replicability of results in the social sciences, we attempted to reproduce the original factor structure for the reasons people give for having sex); (2) extending results across cultures (given social role theory's suggestion

that findings consistent with sexual strategies theory (SST) or features of human mating psychology may not replicate in more gender-egalitarian cultures, investigating the pattern of sexual motivations in Norway is highly relevant; reproducing the factor structure of the original study would not support the social role theory); and (3) testing the theoretical predictions of SST concerning sex differences and differences in long-term versus short-term mating strategies. This would tie the empirical findings from Meston and Buss' original work to extant theory.

The Relevance of Sex of Actor and Mating Strategy for Different Motivations

There are at least two causal factors that potentially influence the relevance of a given motivation for having sex: the sex of the individual and his or her mating strategy (Buss and Schmitt 1993). As Schmitt (2005) has shown, sex and mating strategy are not completely independent. Rather, men tend to be more open to short-term mating strategies than women, based on sex differences in the opportunity costs associated with mating in our species (Trivers 1972). For particular motivations, the importance and contribution of mating strategy and sex of actor might vary, however, such that some motivations will be better predicted by sex of actor while other motivations will be better predicted by mating strategy.

Sex of actor, according to SST (Buss and Schmitt 1993; Kennair, Schmitt, Fjeldavli, and Harlem 2009), predicts sexual behavior at a group level. For example, sex of actor predicts whether sex is a restricted commodity that is bargained for and difficult to attain, or whether there will be an interest in sexual variety. Mating strategy (Buss and Schmitt 1993), the degree to which one is motivated to pursue short-term sexual relations or long-term committed relationships, varies between individuals (Simpson and Gangestad 1991) and can influence sex-typical response patterns.

Reasons for having sex in long-term relationships will be more similar between the sexes. For men, short-term relationships historically have been a means, albeit restricted by female choice, of increasing number of offspring at low cost or with little investment. Although, some costs, such as those inflicted by a woman's kin or primary mate, may be quite severe in some contexts. Therefore, men's reasons for having sex in short-term contexts will likely involve psychological features such as desire for variety, lack of intimacy, and instrumental motivations. Short-term benefits for women are often more complicated, however, as they must outweigh the opportunity costs of pregnancy (Trivers 1972). SST suggests that women can benefit from short-term mating through several different pathways: (1) immediate resources (e.g., food, protection) for herself and offspring; (2) cultivating a backup mate, in the event that her primary relationship is terminated; and (3) acquiring, via extra-pair reproduction, better genes

than her current partner can provide (Greiling and Buss 2000). If the 13 motives are relevant constructs that describe universal features of human motives for having sex, then one should be able to predict from first principles how sex of actor and preferred mating strategy interact to predict differential endorsement of the various sets of motives at the group level (see, e.g., Buss and Schmitt 1993; Schmitt and Buss 1996).

Norway as a Natural Lab for Testing Claims of Universality

First advanced by Buss and Barnes (1986) to represent an alternative explanation to SST, the structural powerlessness hypothesis suggests that sex-differentiated psychological mechanisms have not evolved; rather, sex differences in behavior are a result of current social structures, specifically sexual inequality in personal access to resources. Other authors have further elaborated theories of sexually monomorphic mating psychology, such as social role theory, which would predict that the original SST findings, based on American samples, would be significantly less sexually differentiated, or even sex neutral, in more gender-egalitarian cultures (Eagly and Wood 1999; Wood and Eagly 2007). A society that places value on and actually provides equal rights and opportunities for men and women would offer an ideal population for pitting the competing theories against each other. Norway provides such a population: not only is Norway currently among the world's most egalitarian societies on several different international measures, it has also been so for a long time (Grøntvedt and Kennair 2013).

In the period the data from the original paper were collected (2000–2004), the USA did not exceed the tenth place on the list of most gender-egalitarian nations in the world based on the United Nations gender empowerment measure. During the same time, Norway did not fall below the second place. The difference was comparable in earlier years but is even more pronounced toward the end of the data collection period, in similar, refined measurements of gender equality (e.g., the global gender gap used by the World Economic Forum, see Hausmann, Tyson & Zahidi 2009). If social role theory is correct, we should find that sex differences in mating psychology should decrease or disappear in cultures that are relatively more gender egalitarian—with Norway serving as an ideal natural lab given its extremely high ranking in gender equality. A limited number of studies have investigated sexual or mating psychology in Norwegian samples (Bendixen 2014; Bendixen and Kennair 2014; Bendixen et al. 2015; Grøntvedt and Kennair 2013; Grøntvedt, Kennair, and Mehmetoglu 2015; Kennair, Nordeide, Andreassen, Strønen, and Pallesen 2011; Kennair et al. 2009), and although these support the predictive power of SST over social role theory, further samples from more egalitarian societies are needed in order to test the predictions from theories emphasizing cultural influences

on human sexuality. Because cross-cultural studies that have included Norwegian samples typically have small samples (e.g., Buss, 1989; Lippa 2009), larger samples from more egalitarian societies, such as Norway, are scientifically needed in order to test the predictions from theories emphasizing cultural influences on human sexuality.

Predictions

If the findings from Meston and Buss (2007) reflect relevant features of our evolved motives for sex, then they should be represented in human universal psychological mechanisms. If individuals experience roughly the same inputs to these particular psychological mechanisms, we should find evidence of similar patterns across nations regardless of gender equality. Conversely, if SST is applicable only to cultures with gender inequality, then its predictions regarding sex differences and mating strategy effects would fail to be supported in gender-egalitarian Norway and would instead provide support for social role theory's sexually monomorphic mating psychology. Our first prediction, therefore, is that we will be able to reproduce Meston and Buss's (2007) 13-subfactor structure in a Norwegian sample using a similar method.

Our second prediction is that the factors will show systematic differences based on participant sex and mating strategy, as predicted from the first principles of evolutionary theory and by SST (Buss 1998; Buss and Schmitt 1993; Kennair et al. 2009; Schmitt and Buss 1996). Table 1 summarizes our a priori predictions for each of the 13 subfactors which are described in more detail below. There will be some expected interplay between mating strategy and sex of actor; for example, it might be difficult in a given case to predict from first principles whether long-term-oriented men and short-term-oriented women will differ. Overall, we expected the

largest and most significant differences to be found between short-term-oriented men and long-term-oriented women. Given that this topic has not been investigated previously, our predictions vary in strength and clarity from what Symons (1987) called evolutionarily inspired hunches to more clear and theoretically anchored novel predictions.

Meston and Buss's (2007) physical factor contains four subfactors, which tap motivations related to having sex to obtain good genes or just for the sake of having sex—hallmarks of a short-term mating strategy. The stress reduction subfactor includes items such as “I thought it would relax me” and “I'm addicted to sex.” The pleasure subfactor includes items such as “I wanted to feel the pure pleasure” and “It's fun.” The physical desirability subfactor includes items such as “The person had an attractive body” and “The person had an attractive face.” The experience seeking subfactor combines novelty with sexual variety, as in “I wanted to experience what it would be like to have sex with another person” and “I was curious about my sexual abilities.” Based on SST, these four subfactors were predicted to be endorsed more by individuals pursuing a short-term mating strategy, but perhaps also more likely to be endorsed by men than by women due to men's higher physiological sex drive (Baumeister, Catanese, and Vohs 2001) and greater ease at reaching orgasm via sexual intercourse (e.g., Richters, de Visser, Rissel, and Smith 2006; von Sydow 2002). This is not to say that women do not have sex for reasons of pleasure; indeed, pleasure has been rated among the most frequently endorsed reasons by women for having sex (Meston and Buss 2007). Nonetheless, the threshold for men should be lower than for women to engage in sexual activity based solely on reasons of pleasure.

The goal attainment factor contains four subfactors which focus on using sexual access to obtain tangible or social benefits. The resources subfactor includes items such as “I wanted

Table 1 Predictions of the study

Factor	Subfactor	Mating strategy/sex	Predictions
Physical	Stress reduction	Sex than strategy	ST-Men>LT-Men>ST-Women>LT-Women
	Pleasure	Strategy than sex	ST-Men>ST-Women>LT-Men>LT-Women
	Physical desirability	Sex than strategy	ST-Men>LT-Men=ST-Women>LT-Women
	Experience seeking	Strategy than sex	ST-Men>ST-Women>LT-Men>LT-Women
Goal attainment	Resources	Strategy	ST-Women=ST-Men>LT-Women=LT-Men
	Social status	Sex than strategy	ST-Men>LM=ST-Women>LT-Women
	Revenge	Strategy than sex	ST-Women>ST-Men>LT-Women>LT-Men
	Utilitarian	Unclear	No prediction
Emotional	Love and commitment	Strategy than sex	LT-Women>LT-Men>ST-Women>ST-Men
	Expression	Strategy than sex	LT-Women>LT-Men>ST-Women>ST-Men
Insecurity	Self-esteem boost	Strategy than sex	ST-Men>ST-Women>LT-Women=LT-Men
	Duty/pressure	Sex than strategy	LT-Women>ST-Women>LT-Men>ST-Men
	Mate guarding	Unclear	No prediction

ST-Men short-term-oriented men, *LT-Men* long-term-oriented men, *ST-Women* short-term-oriented women, *LT-Women* long-term-oriented women

to get a job” and “I wanted to get a raise.” The social status subfactor includes reasons such as “I thought it would strengthen my social status” and “I wanted to brag to my friends about my conquests.” The revenge subfactor includes items such as “I wanted to even the score with a cheating partner” and “I wanted to make someone else jealous.” The utilitarian subfactor includes reasons such as “I wanted to get out of doing something” and “I wanted to keep warm.” Because all goal attainment reasons suggest bartering sex for something else, this implies that individuals with a short-term mating strategy, in which feelings of love and attachment are unnecessary prior to sexual relations, will be more likely to endorse these items. The items within each subfactor reflect an array of motivations, preventing us from making clear predictions about sex differences for each specific subfactor.

The emotional factor contains two subfactors that reflect the desire to use sex as a means of cementing a romantic relationship. The love and commitment subfactor includes reasons such as “I wanted to express my love for the person” and “I wanted to show my affection to the person.” The expression subfactor includes items such as “I wanted to welcome someone home” and “I wanted to say I’ve missed you.” The need to express these types of emotions seems to imply a longer-term relationship and likely reflects a desire to instill confidence in a romantic partner about one’s commitment to the relationship. We therefore predicted that the emotional subfactors would be associated with long-term mating strategies but did not predict a sex difference.

The insecurity factor contains three subfactors which represent using sex in a reactive or protective manner. The duty/pressure subfactor includes reasons such as “It was expected of me” and “I didn’t know how to say no.” The mate guarding subfactor includes items such as “I wanted my partner to stay with me” and “I wanted to decrease my partner’s desire to have sex with someone else.” These subfactors reflect motivation to maintain an existing relationship; consequently, we predicted they would be endorsed more by individuals pursuing a long-term strategy. Kennair et al. (2009) found—in a Norwegian sample of couples—that men took the initiative to sex more often and that women reported significantly more satisfaction with frequency of sex in their relationships. Thus, there is reason to believe that women more than men have sex due to duty and pressure, such as unsatisfied nagging from male partners (though we note that Meston and Buss (2007) actually reported that men endorsed the reason “My partner kept insisting” more than women in their sample). Further, we predicted that long-term-oriented individuals would endorse these items more than short-term-oriented individuals due to the greater costliness of the perceived consequences of losing one’s mate or his/her investment. The self-esteem boost subfactor includes reasons such as “I wanted to boost my self-esteem” and “I wanted to feel attractive.” This subfactor suggests using sex in a selfish way rather than to improve a

relationship or provide pleasure to one’s partner; therefore, we predicted that these items would be endorsed more by individuals pursuing a short-term strategy in which commitment and love are not required. We further predicted that for both mating strategy pursuers, men would endorse these reasons more than women because prior research has found that men experience somewhat more enhanced self-esteem from sex than do women (Greiling and Buss 2000) and because Meston and Buss (2007) originally found that men did indeed endorse these reasons more than women.

Methods

Participants

The questionnaire was distributed and collected during different periods from the fall of 2006 until the spring of 2009. Participants were recruited from the Dragvoll campus and Gløshaugen campus, both situated in Trondheim, Norway. A total of 1327 participants (473 men and 854 women) who indicated they had had at least one sexual experience prior to the study constituted the sample of the study.

Measurements

The main part of the Norwegian version of the “YSEX?” questionnaire provided participants with various reasons for engaging in sexual intercourse. Participants were then asked to indicate how often they have had sexual intercourse for each reason. Participants were given five options: 0 % = “None of my sexual experiences,” 25 % = “Few...,” 50 % = “Some...,” 75 % = “Many...,” and 100 % = “All of my sexual experiences.” Numbers which deviated from the pre-set scale were recoded into the aforementioned scale format using thresholds (e.g., a 12 % answer was set to 25 %, 26 % was set to 50 %). In addition, participants were asked to indicate on a 7-point Likert scale the degree to which they were *actively seeking short-term sexual partners* (1 = currently not seeking at all, 7 = currently seeking strongly; Buss and Schmitt 1993). A short-term partner was defined as someone with whom the participant wanted to have sex with at least once (Buss and Schmitt 1993). The mating strategy measure was dichotomized to reflect strategies that were exclusively long-term relationships (i.e., scores = 1) or strategies that include elements of short-term relationships (i.e., scores > 1). The conceptual reason for dichotomizing this variable was that only individuals not at all looking for a short-term partner (i.e., scoring 1 on the scale) should be considered long-term orientated. As such, any level of interest in a short-term partner (i.e., any score above 1) makes the individual short-term orientated. Furthermore, the original 7-point ordinal variable was highly skewed to the right, providing a statistical reason for dichotomizing (Streiner 2002).

The instrument was administered through a translated Norwegian version of the 237-item “YSEX?” questionnaire developed by Meston and Buss (2007). The original questionnaire was translated to Norwegian by a group of Norwegian students and then back-translated by Prof. L. E. O. Kennair (bilingual) and two students who were familiar with American culture and language. The back-translated version was finally approved by Prof. D. M. Buss in order to ensure the original connotations of the items.

Analytical Procedures

To assess our hypotheses, we divided participants into four groups: men looking for a long-term relationship (LT-Men), men looking for a short-term relationship (ST-Men), women looking for a short-term relationship (ST-Women), and women looking for a long-term relationship (LT-Women). The 13 first-order factors reflected by 142 reasons in Meston and Buss's (2007) exploratory study were adopted for the purposes of the current work. These factors are stress reduction, pleasure, physical desirability, experience seeking, resource, social status, revenge, utilitarian, love and commitment, expression, self-esteem boost, duty/pressure, and mate guarding. In order to achieve satisfactory convergent and discriminant validity in our sample, we used 79 of the 142 items to express exactly the same 13 factors extracted by Meston and Buss (2007). More specifically, the 79 items used were the items that represented the 13 factors adequately in that each factor captured a satisfactory amount of variance of their associated items as well as not correlating problematically with any of the other factors. The presence of these two conditions is known to contribute significantly to the improvement of a factor model. The factor model expressed by the 79 items fit the data better than alternative ones, including those using the remaining items. We consider this refinement our contribution to bringing the work of Meston and Buss a step closer to a confirmatory stage, given that the original work necessarily was the very first step in developing an inventory of sexual reasons. Future studies can thus, by building upon our refinement, further strengthen the validity of the inventory and perhaps provide an even more parsimonious one.

The factor model was examined using the principal component approach as done in the original work of Meston and Buss (2007). The principal component analysis in our study was incidentally carried out using the partial least squares structural equation (PLS-SEM) framework using the PLS-PM module of XLSTAT software. PLS-SEM gives similar results to those obtained from the traditional principal component analysis. However, one advantage of using PLS-SEM is that it facilitates an adequate examination of discriminant validity of a factor model. Another advantage is that we directly obtain a factor metric (similar to item aggregates/average) that resembles the original measurement

unit of the items. Finally, we used one-way analysis of variance (ANOVA) to compare the four groups' means on each of the 13 factors (reasons for having sex).

Results

Here, we first establish a satisfactory measurement/factor model and accordingly examine the mean differences between the four groups based on the 13 factors.

Measurement Model

Table 2 provides the details of the measurement model. As can be observed, all of the reflective measures show satisfactory levels of reliabilities (DG rho > 0.70), and average variance extracted (AVE) values are close to or above the recommended threshold of 0.50. Further, all of the loadings are above the guideline of 0.50 (for exploratory studies) and statistically significant. These acceptable measures confirm the convergent validity of the factors.

Another desirable psychometric characteristic of a good measurement model is that the factors exhibit discriminant validity. As observed in Table 3, all the AVE values are larger than the squared correlations between the factors, confirming the discriminant validity of the factors in the measurement model. Due to the demonstrated construct validity (convergent and discriminant), the study's measurement model appears to be a good one, a condition which is necessary for comparing the four groups on the basis of the factors.

ANOVAs for Sex and Preferred Mating Strategy

There was a significant effect of our group (LT-Men, ST-Men, LT-Women, ST-Women) on stress reduction [$F(3, 1323) = 11.003, p < 0.001$]. As shown in Table 4, mean comparisons revealed that LT-Men and ST-Men both had a significantly higher mean than LT-Women on stress reduction. On the same factor, ST-Men had also a significantly higher mean than ST-Women. As for the remaining mean comparisons, no significant differences were found. The groups also differed on pleasure [$F(3, 1323) = 3.437, p < 0.05$]. Mean comparisons revealed that both ST-Men and ST-Women had a significantly higher mean than LT-Women on pleasure. No other significant differences were found between the groups' means.

There was a significant effect of group on physical desirability [$F(3, 1323) = 7.848, p < 0.001$]. According to the mean comparisons, both ST-Men and LT-Men had a significantly higher mean than LT-Women on physical desirability. Further, ST-Women had also a significantly higher mean than LT-Women. No other significant differences were found between the groups' means. On experience seeking, there emerged a significant effect of group [$F(3, 1323) = 20.751, p < 0.001$].

Table 2 Measurement model with standardized factor loadings ($N=1327$)

Constructs	Indicators	Loadings	CR (DG rho)	AVE
Stress reduction	I'm addicted to sex	0.639	0.806	0.458
	I'm a sex addict	0.610		
	I thought it would relax me	0.575		
	It could help me "get sex out of my system" so that I could focus on other things	0.776		
	I thought it would make me feel healthy	0.759		
Pleasure	I wanted to feel the pure pleasure	0.734	0.823	0.538
	It's fun	0.712		
	I was horny	0.729		
	I wanted an orgasm	0.758		
Physical desirability	The person had an attractive body	0.637	0.883	0.560
	The person had an attractive face	0.777		
	The person's physical appearance turned me on	0.686		
	The person was too sexy to resist	0.844		
	I saw the person naked and couldn't resist	0.825		
	The person had beautiful eyes	0.695		
Experience seeking	I wanted to experience what it would be like to have sex with another person	0.648	0.881	0.483
	I wanted to experience whether having sex with another partner would feel different or better	0.653		
	I was curious about my sexual abilities	0.689		
	I wanted the experience	0.709		
	I was curious about how the other person was like in bed	0.773		
	I wanted to improve my sexual skills	0.740		
	I wanted adventure/excitement	0.606		
	I was curious about sex	0.728		
Resources	I wanted to get a job	0.765	0.884	0.608
	I wanted to get a raise	0.906		
	The person offered me drugs to do it	0.891		
	I wanted to make money	0.683		
	I wanted to reproduce	0.613		
Social status	I thought it would strengthen my social status	0.721	0.862	0.511
	I wanted to brag to my friends about my conquest	0.634		
	I wanted to improve my reputation	0.686		
	I wanted to be popular	0.716		
	I wanted to have more sex than my friends	0.753		
	I was competing with someone else to "get the person"	0.770		
Revenge	I wanted to even the score with a cheating partner	0.639	0.869	0.527
	I wanted to make someone else jealous	0.767		
	I wanted to get back at my partner for cheating on me	0.728		
	I wanted to get even with someone (i.e. get revenge)	0.779		
	I wanted to hurt an enemy	0.788		
	I had just ended another relationship and I was vulnerable	0.639		
Utilitarian	I wanted to get out of doing something	0.563	0.743	0.421
	I wanted to keep warm	0.705		
	The person had taken me out on an expensive dinner	0.682		
	I wanted to burn calories	0.635		
Love and commitment	I wanted to express my love for the person	0.620	0.875	0.440
	I wanted to show my affection to the person	0.752		
	I realized I was in love	0.742		
	I wanted to feel connected to the person	0.554		
	I wanted to become one with another person	0.717		
	I desired emotional closeness (i.e. intimacy)	0.622		
	It felt like a natural next step in my relationship	0.692		
	I wanted to increase the emotional bond by having sex	0.646		
	I wanted to communicate on a deeper level	0.594		

Table 2 (continued)

Constructs	Indicators	Loadings	CR (DG rho)	AVE
Expression (consolidation)	I wanted to welcome someone home	0.754	0.882	0.555
	I wanted to say "I've missed you"	0.755		
	I wanted to celebrate a birthday, wedding anniversary or another special occasion	0.659		
	I wanted to say "Goodbye"	0.715		
	I wanted to say "I'm sorry"	0.792		
	I wanted to say "Thank you"	0.786		
Self-esteem boost	I wanted to boost my self-esteem	0.641	0.843	0.520
	I wanted to feel better/get better self-esteem	0.754		
	I wanted to feel attractive	0.786		
	I wanted attention	0.782		
	I wanted my partner to notice me	0.625		
Duty/pressure	It was expected of me	0.530	0.860	0.470
	I felt obliged to	0.614		
	I felt like it was my duty	0.755		
	I did not want to disappoint the person	0.748		
	I didn't know how to say no	0.682		
	I wanted to make him/her stop nagging about sex	0.719		
	My partner kept insisting for a period of time	0.724		
	I wanted my partner to stay with me	0.558		
Mate guarding	I did not want to "lose" the person	0.573	0.854	0.426
	I wanted to prevent a breakup	0.721		
	I wanted to decrease my partner's desire to have sex with someone else	0.603		
	I wanted to keep my partner away from other people	0.718		
	I was afraid my partner would have an affair if I didn't have sex with him/her	0.651		
	I wanted to ensure the relationship was committed	0.761		
	I wanted the person to love me	0.603		

CR composite reliability (Dillon-Goldstein's rho), AVE average variance extracted

Mean comparisons indicated that both ST-Men and ST-Women rated experience seeking significantly higher than LT-Men. Likewise, ST-Men and ST-Women had a significantly higher mean than LT-Women. No other significant differences were found between the groups' means.

Group had a significant effect on resources too [$F(3, 1323)=3.406, p<0.05$]. Mean comparisons indicated that ST-Men rated resources significantly higher than both LT-Women and ST-Women. As for the remaining mean comparisons, no significant differences were found. There was further a significant effect of group on social status [$F(3, 1323)=28.637, p<0.001$]. Mean comparisons revealed that ST-Men had a significantly higher mean on social status than LT-Women, LT-Men, and ST-Women. ST-Women had incidentally a significantly higher mean than LT-Women as well. As for the remaining mean comparisons, no significant differences were found.

For the revenge factor, the effect of group was also significant [$F(3, 1323)=8.761, p<0.001$]. Looking at the mean comparison results in Table 4, we see that ST-Women rated revenge significantly higher than both LT-Women and LT-Men. Furthermore, ST-Men also rated revenge significantly

higher than both LT-Women and LT-Men. No other significant differences were found between the groups' means. The effect of group on utilitarian was significant too [$F(3, 1323)=3.521, p<0.05$]. Mean comparisons showed that ST-Women, ST-Men, and LT-Women all rated the utilitarian factor significantly higher than LT-Men. No other significant differences were found between the groups' means.

On love and commitment, there emerged a significant effect of group [$F(3, 1323)=27.423, p<0.001$]. Mean comparisons revealed that LT-Women had a significantly higher mean on love and commitment than LT-Men, ST-Men, and ST-Women. Further, on the same factor, both LT-Men and ST-Women had a significantly higher mean than ST-Men. No significant difference was found between LT-Men and ST-Women. A significant effect of group on expression emerged [$F(3, 1323)=11.569, p<0.001$]. According to the mean comparisons, LT-Women rated expression significantly higher than LT-Men, ST-Men, and ST-Women. ST-Women had a significantly higher mean than ST-Men as well. No other significant differences were found between the groups' means.

Group had a significant effect on the three remaining factors, namely, self-esteem boost [$F(3, 1323)=3.717,$

Table 3 Discriminant validity (squared correlations < AVE) (N= 1327)

	Stress	Pleasure	Physical desirability	Experience seeking	Resources	Social status	Revenge	Utilitarian	Love and commitment	Expression	Self-esteem	Duty/pressure	Mate guarding
Stress reduction	1												
Pleasure	0.146	1											
Physical desirability	0.149	0.272	1										
Experience seeking	0.266	0.233	0.191	1									
Resources	0.062	0.001	0.000	0.040	1								
Social status	0.144	0.019	0.023	0.169	0.084	1							
Revenge	0.120	0.007	0.011	0.066	0.225	0.256	1						
Utilitarian	0.159	0.027	0.045	0.098	0.162	0.131	0.175	1					
Love and commitment	0.043	0.147	0.152	0.080	0.000	0.002	0.000	0.033	1				
Expression	0.110	0.101	0.099	0.123	0.014	0.023	0.067	0.147	0.237	1			
Self-esteem boost	0.223	0.112	0.109	0.396	0.024	0.193	0.061	0.128	0.119	0.147	1		
Duty/pressure	0.099	0.013	0.029	0.134	0.020	0.130	0.068	0.122	0.031	0.109	0.193	1	
Mate guarding	0.137	0.029	0.069	0.152	0.048	0.083	0.183	0.158	0.116	0.136	0.238	0.213	1
Average variance extracted	0.458	0.538	0.560	0.483	0.608	0.511	0.527	0.421	0.440	0.555	0.520	0.470	0.426

$p < 0.05$], duty/pressure [$F(3, 1323) = 4.667, p < 0.01$], and mate guarding [$F(3, 1323) = 6.011, p < 0.001$]. The mean comparisons revealed the same pattern for all three of these factors: both ST-Men and ST-Women rated each factor significantly higher than LT-Men did. ST-Women had also a significantly higher mean on each factor than LT-Women did. No other significant differences were found between the groups' means.

Until now, we have presented only the significant mean differences between the four groups. In Fig. 1, we visualize the means of these groups to facilitate a further understanding of the study's results. From this, we can conclude that most of the specific predictions were supported for relationships between the four groups. For social status and love and commitment, five of six specific relationships were as predicted. For experience seeking, revenge, and expression, four of six predictions were confirmed. For stress reduction and physical desirability, three of the six specific relationships were predicted. For pleasure and self-esteem boost, two of the six specific relationships were predicted.

As a further analytical step, we used a series of regression analyses to predict the 13 reasons for having sex from mating strategy (term) and sex of respondent to identify and compare the magnitudes of their effects. The results, shown in Table 5, indicate that sex has a stronger effect than strategy on the reason stress reduction, whereas strategy exerts a stronger effect than sex on pleasure, experience seeking, and revenge. There were however no statistical differences between the effects of sex and strategy on the remaining factors; thus, predictions suggesting that either sex or strategy would be most relevant were not quite accurate for the latter factors, as both variables impacted reasons for having sex.

Discussion

The first aim of this study was to reproduce the 13-subfactor structure found in Meston and Buss (2007) in a more gender-egalitarian culture (i.e., Norway) using the same method as the original study. The data analysis showed that the measurement model developed based on Meston and Buss (2007) was indeed satisfactory, indicating that the 13 reasons for having sex are applicable to the Norwegian sample as well. Further, the refinement and reduction of items could bring this scale closer to a confirmative stage. We then tested the applicability of SST to predict how sex of respondent and mating context impact the endorsement of the 13 groups of reasons for having sex.

Both mating strategy and sex of respondent influence endorsement of the 13 subfactors, as shown in Fig. 1. This suggests that SST (Buss and Schmitt 1993) and our interpretation of previous empirical research made it possible to predict the impact of sex and mating strategy on endorsement of reasons

Table 4 The means of the four groups on the 13 factors (reasons for having sex) ($N=1327$)

Factor	Groups				Significant* mean differences found between
	LT-Men	ST-Men	ST-Women	LT-Women	
Stress reduction	1.384 (0.490)	1.447 (0.600)	1.292 (0.456)	1.259 (0.427)	LM>LW; SM>LW; SM>SW
Pleasure	3.171 (0.894)	3.320 (1.021)	3.313 (0.887)	3.147 (0.926)	SM>LW; SW>LW
Physical desirability	2.482 (1.027)	2.554 (0.925)	2.426 (0.859)	2.256 (0.912)	LM>LW; SM>LW; SW>LW
Experience seeking	1.712 (0.553)	1.953 (0.724)	1.873 (0.616)	1.643 (0.541)	SM>LW; SW>LW; SW>LM; SM>LM
Resources	1.023 (0.083)	1.053 (0.307)	1.017 (0.136)	1.015 (0.097)	SM>LW; SM>SW
Social status	1.068 (0.173)	1.204 (0.428)	1.079 (0.252)	1.034 (0.123)	SM>LW; SW>LW; SM>SW; SM>LM
Revenge	1.031 (0.138)	1.102 (0.312)	1.084 (0.216)	1.035 (0.148)	SM>LW; SW>LW; SW>LM; SM>LM
Utilitarian	1.065 (0.157)	1.124 (0.299)	1.146 (0.298)	1.119 (0.213)	LM<LW; SW>LM; SM>LM
Love and commitment	2.375 (0.738)	2.137 (0.776)	2.394 (0.711)	2.615 (0.751)	LM<LW; SM<LW; SW<LW; SW>SM; LM>SM
Expression	1.458 (0.474)	1.429 (0.496)	1.541 (0.550)	1.631 (0.524)	LM<LW; SM<LW; SW<LW; SW>SM
Self-esteem	1.420 (0.517)	1.539 (0.665)	1.588 (0.592)	1.485 (0.531)	SW>LW; SW>LM
Duty/pressure	1.215 (0.360)	1.306 (0.432)	1.351 (0.477)	1.268 (0.373)	SW>LW; SW>LM
Mate guarding	1.135 (0.280)	1.228 (0.393)	1.262 (0.433)	1.181 (0.297)	SW>LW; SW>LM; SM>LM

() show standard deviations

SM short-term-oriented men, LM long-term-oriented men, SW short-term-oriented women, LW long-term-oriented women

* $p<0.05$ using the Newman-Keuls post hoc test

for having sex. Mating strategy and sex of respondent influenced the 13 subfactors differently. However, the differences between the four groups were small (Table 5) and there were fewer differences than predicted. Despite investigating endorsement of reasons for having sex in one of the most egalitarian societies in the world, there still seems to be an effect of biological sex, and sex differences are relevant despite predictions from social role theory concerning reduced differences in more egalitarian samples (Eagly and Wood 1999; Wood and Eagly 2007).

There was considerable difference between the subfactors with regard to endorsement by all four groups. Overall, both sexes rated pleasure as the most relevant motive for sexual intercourse, as Meston and Buss (2007) also found in the original study. Also, the love and commitment subfactor was highly endorsed, as in the original study. Similarities were also found in the least endorsed subfactors, where both samples showed overall low values for resources, revenge, and social status. Despite there being many different reasons for sex, and there is a need to considering these many different motives in different contexts (from sex in long-term relationships to sexual harassment), some conscious reasons for having sex are obviously more typical than others, and the pattern is stable across these two nations.

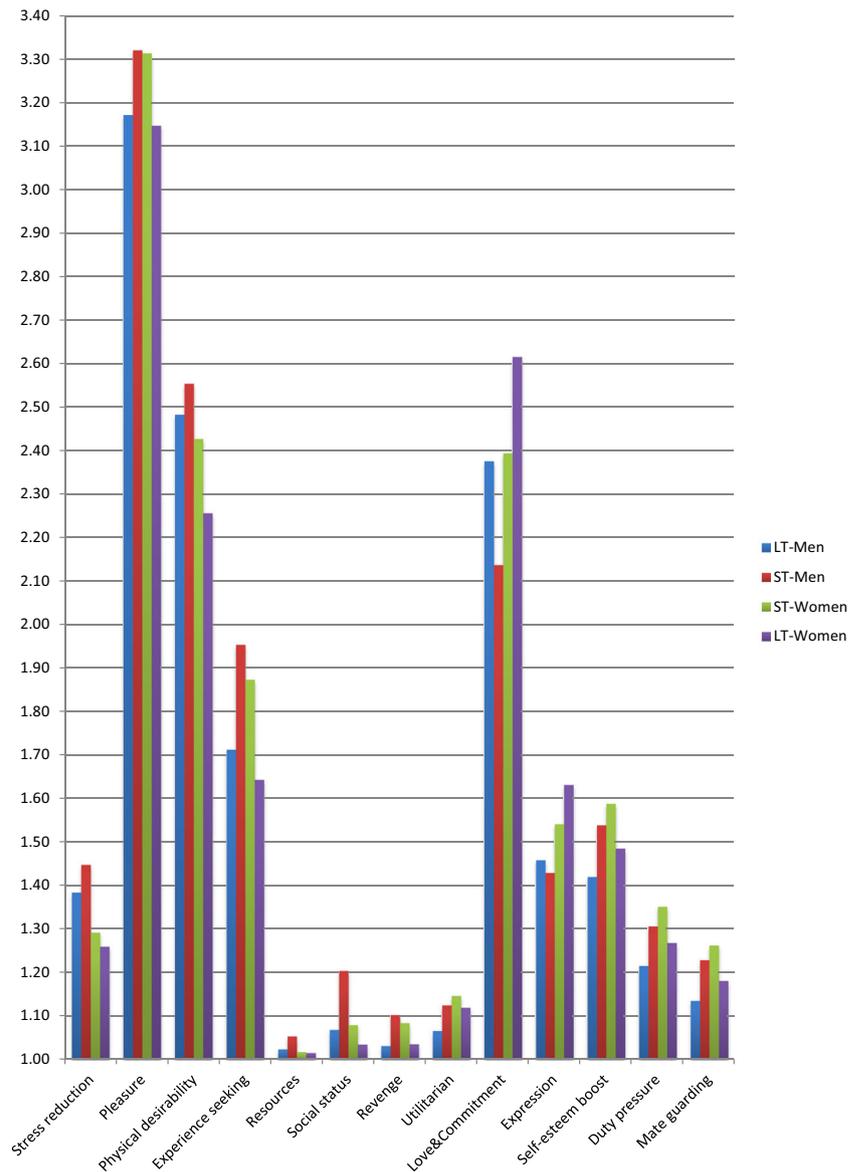
Some findings are more difficult to explain with the current theory. Could the pattern of the subfactor mate guarding emerge because short-term-oriented individuals wish to use sex as a means of contact, but long-term-oriented individuals associate sex with making love, confirming the committed

relationship (Perilloux, Fleischman, and Buss 2008)? The instrumentalism of these reasons might therefore not be perceived as relevant for long-term individuals, especially when their relationship is threatened. People pursuing a short-term mating context could also be interested in keeping a partner for opportunistic sex. Explanations for the intriguing subfactor patterns await future empirical tests.

Love and commitment and expression varied as a function of both sex and mating strategy. Previous studies (Buss and Schmitt 1993; Buss et al. 1999; Schmitt and Buss 1996; Trivers 1972) have indicated that women prefer a partner who is willing to invest in the relationship; reasons for sex associated with love and commitment are likely behavioral consequences of this desire.

It was not clear why mating strategy would also impact duty/pressure reasons; we would still expect the effect of sex rather than strategy, and we would especially not expect short-term strategies to have the greatest impact. However, the items included in the subfactor might be differentially important for the different strategies. Our original prediction was based on the notion that these items (e.g., “My partner kept insisting for a period of time” and “I wanted to make him/her stop nagging about sex”) were reasons to engage in sex specifically in long-term contexts as they were linked to a partner and a longer period of time, suggesting a longer relationship. But it might be that the reasons linked to pressure such as “I didn’t know how to say no” (especially in short-term relationships) have greater impact than the reasons linked to duty (“I felt like it was my duty”; especially

Fig. 1 Reasons for having sex by the four groups (LT-Men, ST-Men, ST-Women, and LT-Women)



in long-term relationships). In addition, the pressure items might be linked to similar processes as in sexual harassment and not necessarily primarily relevant for secure and mature sexual relationships. Kennair and Bendixen (2012) found that pursuit of a short-term strategy was linked both to increased harassment of others as well as increased risk of being harassed. Sexual pressure is a form of sexual harassment. If unrestricted sexual orientation and sexual harassment are linked, then short-term relationships might be more relevant for endorsing pressure as a reason for having sex.

The resources subfactor was predicted to be associated most with strategy. We expected that women could use sex as a way of obtaining resources (such as a job or a raise), but that does not mean that our sample has done this or will admit to it. Even in a sexually liberal society such as Norway, admitting to prostitution-like behavior is undesirable (Bendixen

and Kennair 2008, 2009). Thus, there may be a general dampening of female endorsement of such items, resulting in the sex difference. Why mating strategy did not emerge as the main predictor must await future research.

Despite several predictive failures and interesting empirical anomalies, the a priori predictions (especially the relationships between the specific groups) were largely supported, suggesting that SST (Buss and Schmitt 1993) is a relevant theoretical framework for understanding when and who will be motivated by various reasons for having sex.

Limitations and Future Directions

Despite Norway and the USA having different gender equality ratings by the UN (2009) and World Economic Forum (Hausmann, Tyson, and Zahidi 2009) in the relevant time period,

Table 5 Comparison of the coefficients on mating strategy (term) and sex predicting the 13 reasons

	Stress reduction	Pleasure	Physical desirability	Experience seeking	Resources	Social status	Revenge	Utilitarian	Love and commitment	Expression	Self-esteem	Duty/pressure	Mate guarding
Term	<i>0.028</i> [0.074]	<i>0.157</i> [0.162]	<i>0.122</i> [0.128]	<i>0.224</i> [0.391]	<i>0.010</i> [0.087]	<i>0.070</i> [0.385]	<i>0.057</i> [0.333]	<i>0.0328</i> [0.143]	<i>-0.247</i> [-0.300]	<i>-0.080</i> [-0.156]	<i>0.100</i> [0.181]	<i>0.074</i> [0.205]	<i>0.0786</i> [0.258]
Sex	<i>-0.134</i> [-0.357]	<i>-0.009</i> [-0.009]	<i>-0.154</i> [-0.161]	<i>-0.079</i> [-0.139]	<i>-0.022</i> [-0.180]	<i>-0.082</i> [-0.451]	<i>-0.008</i> [-0.053]	<i>0.0359</i> [0.156]	<i>0.267</i> [0.324]	<i>0.141</i> [0.274]	<i>0.064</i> [0.116]	<i>0.049</i> [0.137]	<i>0.0410</i> [0.135]
Term-sex	<i>0.106</i> **	<i>0.148</i> *	<i>0.031</i>	<i>0.144</i> **	<i>0.011</i>	<i>0.012</i>	<i>0.042</i> **	<i>-0.003</i>	<i>0.019</i>	<i>0.060</i>	<i>0.036</i>	<i>0.024</i>	<i>0.037</i>

Unstandardized coefficients in italics. [] show effect sizes in terms of semi-standardized coefficients corresponding to Cohen's *d*

*Significant at 0.1, **significant at 0.05

some might argue that these nations still are more similar than not. And it is true that they are both Western nations. Yet, any claim, such as that of social role theory, that the sex differences found in the USA will be attenuated in more gender-egalitarian cultures requires testing in a gender-egalitarian culture, and Norway represents arguably the highest levels of gender equality in the world. If the sex differences are not significantly lower in such a culture, then a key empirical prediction from social role theory is not supported. Therefore, the relevance of the structural powerlessness hypothesis (Buss and Barnes 1986) and the similarly based social role theory (Eagly and Wood 1999; Wood and Eagly 2007) has been weakened by the current results.

Meston and Buss (2007) indicated social desirability as one potential limitation of this type of study. Previous research has indicated that self-reported sexuality and impression enhancement have been a problem for American samples in the age group investigated (Meston, Heiman, Trapnell, and Paulhus 1998), where women act in a more sexually restrained manner and endorse more conservative attitudes toward uncommitted sexual relations. We acknowledge that this might also be a problem in the Norwegian sample. But we suggest that the Norwegian sample is more liberal about sexual matters than the American sample (Widmer, Treas, and Newcomb 1998). The Norwegian youth culture is well informed with regard to sexual behavior. This is reflected in radio and TV shows answering questions about sex and explicitly showing other types of sexual behavior than in traditional sex education. Both of these programs are specifically directed toward youths, and the presenters are young adults. This liberal attitude of young Norwegians seems to be reflected in the current paper: women who are short-term oriented rated themselves highest of all four groups on self-esteem boost, utilitarian, duty/pressure, and mate guarding, and significantly higher than some men on 8 of the 13 reasons. Social desirability surrounding issues of sexuality, therefore, is less likely to be a problem in Norway than in most other cultures.

The major limitation of the current study is that we had few control variables. The questionnaire containing the full list of items was too long to include additional questionnaires, given that participation was entirely voluntary and no credits could be awarded. Furthermore, the operationalization of short-term orientation may be improved in future research, including perhaps longer-form measures of sociosexual orientation (Penke and Asendorpf 2008; Simpson and Gangestad 1991).

It is relevant to note that these are the reasons of young students in both the USA and Norway. There is reason to believe that mating psychology varies with age, and an older sample might therefore have had more explicitly reproductive reasons (Easton, Confer, Goetz, and Buss 2010) and maybe also considered resource exchange from the sexual economics of long-term heterosexual relationships (Baumeister and Vohs 2004). A younger sample may also be more short-term oriented, although this is not certain (Bleske-Rechek, VandenHeuvel, and Vander Wyst 2009). Future investigations

probably ought to consider whether the factor structure is stable in older samples. However, for the current reproduction of the findings of Meston and Buss's (2007) factor structure with an American undergraduate sample, young Norwegian students are seen as the most relevant sample.

Conclusion

The current paper makes three major contributions. In the current scientific context that some highly touted psychological findings turn out to be embarrassingly unreplicable, studies that reproduce original findings are urgently needed (Ioannidis 2005). Further, there needs to be tests of the generalizability of findings, especially in nations that differ in levels of gender equality. The current study provides both reproduction of the original factor structure and cross-cultural generalizability. The categories of reasons for sex discovered by Meston and Buss (2007) are both theoretically meaningful and possible to reproduce cross-nationally. Second, the current research provides clear empirical tests of various social role theories; these tests disconfirm those key predictions. Third, the current paper tests a number of novel a priori theoretical predictions, derived from considering the interaction of gender and preferred mating strategy, most of which were confirmed. Taken together, these three contributions advance both theory and empirical knowledge of human sexual strategies.

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