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Sex Differences in Sexual Desires and Attitudes in Norwegian Samples

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Abstract

Despite highly replicable predictable differences between the sexes on various sexual desires and attitudes, critics of evolutionary perspectives argue against the biological origins of such differences, highlighting cultural explanations. Critics suggest that there are no cross-cultural evolutionary predictable, systematic differences. Eagly and Wood (1999) suggest that in egalitarian cultures sex differences will be small or disappear. We tested whether Trivers' (1972) Parental Investment Theory and Buss and Schmitt's (1993) Sexual Strategies Theory predicted sex differences in sexuality within samples of students (N=1072) in egalitarian Norway. We expected similar interest in long-term relationships, but that females seek short-term partners less than males. Furthermore, males were expected to have less restricted sociosexuality, fantasize more, take more initiative to sex and be less satisfied with frequency of sex. The predictions were supported in the evolutionarily-predicted directions. Clinical consequences of claiming there are no sex differences in sexuality, when indeed they exist, are discussed.

Keywords: sex desire; sex differences; Norway

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Introduction

Cultural approaches to sexuality often focus on conspicuous sexual variations between cultures. Some sexual behaviour is highlighted as distinctive in one culture, and it is solely described as the result of traditional practices and sets of beliefs within that particular culture. Often missing from such cultural ethnographies is a recognition of functionally similar sexual behaviours as expressed in other cultures, especially as expressed within the context of hunter-gatherer cultures that are most representative of our ancestral past (Brown, 1991).

Although it is true that many sexual attitudes and behaviours vary across cultures, much of human sexuality shows a degree of consistency across cultures. Evolutionary approaches to human sexuality have been used to explain many of these observed sexual similarities across cultures, especially similarities regarding sex differences in sexuality (e.g., Buss, 1989; Symons, 1979). Indeed, even cultural variations in the degree of sexual differentiation have been amenable to evolutionary explication (Gangestad et al., 2006; Low, 2000; Schmitt, 2005).

Critics of biological explanations of human sexuality insist, however, that variability across cultures is evidence against evolutionary psychology, and continue to downplay the importance of evolutionary theory's ability to predict human psychology and sexuality (see, e.g., Segal, 2000). In a critique of the application of biological and evolutionary theory (more precisely, Trivers' (1972) parental investment theory), a Norwegian gender researcher claimed there is nothing about the production of egg cells or sperm that predicts sexual behaviour (see Lorentzen, 2004).

In fact, Trivers' (1972) theory is about the relative contributions to parental investment by males and females across species. Although egg cells and sperm do represent differences in the minimal contributions of females and males to offspring—with female egg cells representing a higher contribution than male sperm cells—in many species the overall level of parental investment is actually greater in males (e.g., the Mormon cricket, katydids, and seahorses). In humans and all mammals, however, the relative investment contributions of females are much larger than males (e.g., internal female fertilization, gestation, and lactation are necessary

investments by human females in natural environments). In addition, human males typically invest considerably less in active parenting effort than females do across all known cultures (Low, 1989). In short, humans do appear to be a typical animal in that human females invest more in offspring than human males.

Even so, it is perhaps possible that humans are exempt from the implications of this sex difference in parental investment. There are several specific predictions that follow from Trivers' (1972) middle-level theory of parental investment that would allow us to test this supposition (see Buss, 2004; Kennair, 2004; Kenrick et al., 1990; Ketelaar & Ellis, 2000). Namely, the sex that invests more in offspring (in humans, the female sex), tends to be relatively discriminating in mate choice, to be smaller in physical size, to mature earlier, to be less aggressive, and to pursue less risky life history strategies (Alexander & Noonan, 1979). All of these empirical predictions have been repeatedly tested and confirmed as existing sex differences in humans (for a review, see Schmitt et al., 2003). Again, Trivers' theory suggests that it is the degree of parental investment, not biological sex itself, that actually predicts sex differences in mating behaviour. As such, there have been few theories more robust and empirically verified than parental investment theory and its application to sex differences in humans.

Over a decade ago, Buss and Schmitt (1993) extended Trivers' (1972) theory by proposing Sexual Strategies Theory (SST). According to SST, men and women have evolved a repertoire of different mating actions, tactics, and strategies. One fundamental strategy within this repertoire is long-term mating. Long-term mating is typically marked by extended courtship, heavy investment, the pair-bonding emotion of love, and the dedication of resources over a long temporal span to the mating relationship and any offspring that ensue. Another strategy within our human repertoire is short-term mating, defined as a fleeting sexual encounter such as a one-night stand. Between the ends of this temporal continuum are brief affairs, prolonged romances, and other intermediate-term relationships. Which sexual strategy or mix of strategies an individual pursues is predicted to be contingent on factors such as opportunity, personal mate value, sex ratio in the local mating pool, parental influences, regnant cultural norms, and other features of social and personal context (see also Gangestad & Simpson, 2000; Schmitt, 2005).

Although SST views both sexes as having long-term and short-term strategies within their repertoire, men and women are predicted to differ fundamentally in certain respects. In short-term mating, for example, both sexes are predicted to pursue brief mating opportunities in delimited contexts, but for different reproductive reasons that reflect sex-specific adaptive problems. For women, the asymmetry in obligatory parental investment leaves them little to gain in reproductive output by engaging in indiscriminate, short-term sex with numerous partners (see Schmitt et al., 2003). However, for men the potential reproductive benefits from less discriminate mating can be profound. Consider that one man can produce as many as 100 offspring by indiscriminately mating with 100 women in a given year, whereas a man who is monogamous will tend to have only one child with his sole partner during that same time period. In evolutionary currencies, this represents a strong selective pressure—and a potent adaptive problem—for men's mating strategies to favor at least some desire for sexual variety (Buss & Schmitt, 1993).

In contrast, whether a woman mates with 100 men or is monogamously bonded with only one man, she will still tend to produce only one child in a given year. The potential reproductive benefits from multiple mating with numerous partners, therefore, are much higher for men than women (Symons, 1979). But men cannot mathematically in average have more heterosexual short-term sex than females in average, despite having evolutionary benefits and thus probably evolved desires for short-term sex. For each male who has heterosexual sex, there will be a female partner - thus for each intercourse the two sexes will both increase their score by one. Thus female desire may, where females have the freedom to choose, limit average male short-term sex.

It is important to note that women can reap evolutionary benefits from short-term mating as well. A key caveat to this, however, is that women's short-term strategy appears to center more on obtaining a man of particularly high status or genetic *quality* (e.g., a man with high facial symmetry, high facial masculinity, and ample testosterone; see Gangestad, 2001) rather than obtaining numerous men in a way that generates high-volume *quantity*.

A key premise of SST, therefore, is that both sexes can reap reproductive rewards from engaging in short-term mating under certain circumstances. Even though both sexes may adaptively pursue short-term mateships, however, men and women are hypothesized by SST to

differ in the *evolved psychological design* of their short-term strategies. According to SST, three of the more distinctive features of men's short-term mating psychology are: (1) men possess a greater desire than women do for a variety of sexual partners, (2) men require less time to elapse than women do before consenting to sexual intercourse, and (3) men tend to more actively seek short-term mateships than women do (Buss & Schmitt, 1993, p. 210). In each case, these hypothesized desires function to help solve men's adaptive problem of obtaining large numbers of short-term partners.

Schmitt et al. (2003) confirmed the existence of these sex differences in short-term mating psychology across several samples from the International Sexuality Description Project (ISDP; see also Schmitt, 2005). Although sex differences in short-term mating tendencies have appeared to be somewhat larger in more conservative and traditional cultures (Schmitt, 2005), few samples across the ISDP were from nations sufficiently high enough in progressive sex-role ideology to test the implication that truly liberal attitudes toward men's and women's sexual roles will eliminate sex differences in sexual psychology (see Eagly & Wood, 1999; Lorentzen, 2004; cf. Lueptow et al., 2001). Consequently, in this article we attempted to replicate these classic sex differences in short-term mating psychology with the relatively progressive nation of Norway (Williams & Best, 1990; Williams et al., 1979). Indeed, Norway is typically the highest rated nation in terms of gender empowerment as indexed by the United Nations (United Nations Development Programme, 1997). We are not arguing that there are no differences in gender roles – obviously there may be. We wish to test whether these – when considering sexual behaviour, desires and attitudes – are influenced and predicted by biology or mainly predicted by the cultural attitudes. From an evolutionary perspective one expects culture to be generated by evolved mental mechanisms (Tooby & Cosmides, 1992). Eagly & Wood (1999) expect the Norwegian culture to affect our findings.

Based on SST, we expect to find sex differences in short-term mating psychology despite the largely secularised (Zuckerman, 2007) and increasingly progressive (Bjerke et al., 1989) culture of Norway. In Norway, attitudes to sex are now mostly based on the principle that adolescents and young adults of both sexes are entitled to have sex if they are 16, consenting and protect

themselves against unwanted pregnancies and sexually transmitted diseases. We expect these differences despite the positive attitudes to single mothers and welfare benefits for single mothers in Norway. Norwegian culture may be among the most sexually liberal and progressive among modern nations (Williams & Best, 1990; consider also Lewin, 2008, for an historical, sociological analysis of Scandinavia in general), and is an exceptional test-case for determining whether sex differences in sexual psychology disappear when men and women are treated similarly in terms of politics, education, and socialization (United Nations Development Programme, 1997). Obviously there may be personal attitudes about what it means to be a man or woman in relation to sexual desires – but if this is so these are supposed to be among the least bifurcated and influential given Norwegian culture. An alternative would be that cultures do not influence these personal attitudes and roles – this would suggest the Eagly & Wood's (1999) argument is incorrect, but it would not mean that there are no cross cultural attitudes and roles. Yet again, evolutionary theory attempts to explain the origins of these attitudes and roles.

In this article, we tested the following predictions that follow from parental investment theory (Trivers, 1972) and SST (Buss & Schmitt, 1993):

Hypothesis 1: Both women *and* men have long term mating in their strategic repertoires, and hence do not differ systematically in any predictable manner in the degree to which they seek long term mates, when not in relationships. This follows from the cost of human infants, and thereby the increased fitness of offspring that receive male investment.

Hypothesis 2: Men should tend to more actively seek short-term mateships than women do (see Buss & Schmitt, 1993; Schmitt et al., 2003; Schmitt, Shackelford, & Buss, 2001).

Hypothesis 3: Men should possess a greater desire than women do for a variety of sexual partners (see Buss & Schmitt, 1993; Schmitt et al., 2003; Schmitt, Shackelford, & Buss, 2001).

Hypothesis 4: Men should require less time to elapse than women do before consenting to sexual intercourse (see Buss & Schmitt, 1993; Clark & Hatfield, 1989; Schmitt et al., 2003; Schmitt, Shackelford, & Buss, 2001).

Hypothesis 5: If with a long-term partner, men should take the initiative more to have sex with their partner (Okami & Shackelford, 2001).

Hypothesis 6: If with a long-term partner, men should be less satisfied with the frequency of sex within the relationship (Okami & Shackelford, 2001).

Note that Hypothesis 5 and 6 do not follow directly from SST (Buss & Schmitt, 1993), although SST does expect men to have a stronger sex drive in general. There may be many contextual factors that may play a role here, including a wish to have children. As we have no measures of these contextual factors we can only address the question of whether males have a general stronger sex drive, even in a sexual liberal and egalitarian culture.

Hypothesis 7: Men should fantasize about sex with someone other than their current partner more than women do (see also Ellis & Symons, 1990).

Hypothesis 8: Men and women should not differ in the number of past sexual partners.

This is more an expectation, than a hypothesis. Less than being a test of human sexuality, this says something about the sample: whether the groups of males and females are overlapping mating populations, and whether they are answering truthfully. Thus we expect that men and women should not differ in the number of past sexual partners they have had.

There cannot be, mathematically, a difference between the number of heterosexual sexual partners of males and females – in average – if the respondents are telling the truth and the two sexes are overlapping mating populations. There must be one female sexual short-term encounter for each heterosexual males short-term sexual intercourse. Thus average behavioural similarity is given. There just cannot be a true average sex difference. Studies that that find a difference may either have biased reporting (maybe due to gender roles or cultural attitudes, consider Jonason & Fisher, 2009), or sampling of non-overlapping mating populations. It is the differences in desires and attitudes and behaviour not limited or influenced by the other sex' behaviour that are predicted in this study.

Hypothesis 9: Men should possess more positive attitudes toward unrestricted, low commitment sex than women do; that is, they should on average have a more unrestricted sociosexuality than women do (see Schmitt, 2005; Simpson & Gangestad, 1991).

Of course, cross-cultural replication and support for these hypotheses would not, in itself, provide definitive proof that the results are due to evolved mental mechanisms. However, such

results would represent a refutation of the claim (see Lorentzen, 2004) that sexual behaviour is not predicted by parental investment theory (Trivers, 1972) or, more specifically Sexual Strategies Theory (Buss & Schmitt, 1993). Moreover, support when testing these hypotheses in Norwegian culture would provide an important extension of the systematic pattern of results found in Buss and Schmitt (1993) across a highly progressive culture, and would make it reasonable to claim that parental investment theory, and Sexual Strategies Theory, may predict the sexual behaviours, attitudes and desires of young human adults. This would not mean that cultural influences are not important or that gender identity does not exist – these influences surely exist and may be studied. But this provides one the best tests of, and most obvious cultures to test the impact of biology, given the predictions of Eagly and Wood (1999).

Methods

Participants

We utilized three different samples for the present study. All of them included students at the Norwegian University of Science and Technology in Trondheim (NTNU). The first sample was collected for the *International Sexuality Description Project 2* (ISDP-2) administered by David P. Schmitt. For this sample, we distributed 200 questionnaires to psychology students at NTNU and 16 male cadets at the Royal Norwegian Air Force Academy. A total of 130 responded (65%), including 82 women and 48 men. Respondents were 23.1 years old on average (collected spring 2006).

The second sample consisted of 86 psychology students, 68 females (average age of 21.6) and 18 males (average age of 23.7) (collected autumn 2007).

In the third sample, 1195 questionnaires were distributed, 954 individuals responded (80%). This sample consisted of students from a broad range of different subjects and disciplines; mathematics, chemistry, physics, informatics (computer science), social anthropology, social economics and history. A total of 562 men and 383 women participated. Respondent's average age was 20.6 years (collected summer 2008)

The total sample was examined for invalid responses. Participants who did not state their sex, provided undifferentiated responses (providing the same answer to all time periods) to the question of *Probability of consenting to sexual intercourse* (most undifferentiated female answers were negative, most undifferentiated male answers were positive), provided extreme (several thousand) or unserious scores on the question of *Number of sexual partners desired* (all of these were male), provided inconsistencies such as claiming no sexual relationships in relationship status and stating that one had had more than zero partners on the SOI items, and those whose age was below 18 (all participants were above 18) were removed from analyses. The distribution would have been influenced and skewed by these cases, although it is worth noting that, in general, they would have increased differences in the supportive direction of the hypotheses.

Also, to increase the homogeneity of the sample we only included participants less than 30 years of age. This was because there is reason to believe that different age groups will respond systematically different to our questions in ways that we cannot address given our limited distributions of ages (Schmitt et al., 2002).

The final sample used for analyses is presented in the following, Table 1. Due to missing data, the *N* for each analysis varies – no missing data was replaced.

Table 1. Descriptive data.

	Females		Males	
N	512		560	
Age *M* (*SD*)	20.84	(2.04)	20.76	(1.96)
Engaged *N* (%)	10	(2)	4	(1)
Married *N* (%)	4	(1)	3	(1)
Cohabiting *N* (%)	125	(24)	73	(13)
Currently dating more than one *N* (%)	17	(3)	22	(4)
Currently dating one *N* (%)	160	(31)	125	(22)
Not currently in relationship *N* (%)	183	(36)	296	(53)
Never had sexual relations *N* (%)	31	(6)	77	(14)

Note: Several different answers were possible for dating status.

Procedure

The participants filled out anonymous questionnaires in lectures. They did not receive credit or any other reward for partaking in the study. All respondents were carefully informed that the survey was totally voluntary and completely anonymous.

To ensure anonymity, the respondents a) were asked not to show their answers to anyone, b) were asked not to write their names on the survey or make any marks that could identify them, and c) were asked to deposit their questionnaires in a sealed drop box.

The paper questionnaires used in the first and third sample were scanned electronically. While the first sample received all of the questions of the ISDP-2, the two latter samples were only asked about the measures described below providing the specific tests of this paper.

Measures

The items were translated for the International Sexuality Description Project 2. In addition to reporting their sex, age and current dating status (items 1, 2 and 3), participants responded to measures of different sexual strategies (items 4, 5 and 7), experience of control over and satisfaction in sexual activity in sexual dyads (item 6), and facets of the respondents overt and covert sociosexual behaviours and sexual attitudes (items 8, 9, 10, 11, and 12).

Anonymous Romantic Attraction Survey

The following items were used in Buss & Schmitt's (1993) paper on the Sexual Strategies Theory.

Mating orientation. "Please state the degree to which you currently are seeking a long-term mate (e.g. marriage) and the degree to which you currently are seeking a short-term mate (e.g. one-night stands or short affairs etc.)"

Both items were rated on 7-point Likert-scales (1=not at all currently seeking, 7= strongly currently seeking). Feedback suggested that it was difficult for satisfied and faithful participants currently in relationships to decide whether they should indicate their satisfaction with their

relationship with a high or low score. We therefore only use participants that are not in a current relationship in the analyses of answers to these items.

Number of sexual partners desired. "How many sexual partners would you ideally like to have... ... tomorrow?, ... the next day?, ... next week?, ... next six month?, ... the next year?, ... 2 years?, ... 3 years?, ... 4 years?, ... 5 years?, ... 10 years?, ... 20 years?, ... 30 years?, and ... rest of your life?"

Respondents were asked to add up the numbers. For example, if you would like 4 sexual partners in the next 6 months and 6 more in the 6 months after, you have to write 10 in "the next year" and so on.

Probability of consenting to sexual intercourse. "If the conditions were right, would you consider having sexual intercourse with someone you viewed as desirable if you had known that person for... ... 10 years?, ... 5 years?, ... 2 years?, ... 1 year?, ... 6 moths?, ... 3 months?, ... 1 month?, ... 1 week?, ... 1 day?, ... 1 evening?, ... 1 hour? ... 1 minute?"

Each time interval was rated on a 6-point Likert-scale (1=definitely yes, 6=definitely no). There is no neutral choice.

Even so, typically the statistical difference between treating these scales as categorical versus continuous are negligible. In the end eliminating the 0-point does not have a meaningful impact and reporting means on these scales is reasonable (Schmitt et al., 2003). In addition, we felt eliminating the neutral point was very important for obtaining higher quality data (studies show with sensitive questions many people defer to the neutral point and we wanted to avoid this; we wanted subjects to make a decision either positive or negative toward having sex at different points in time).

Dyadic Sexual Regulation (DSR)

The next two items are taken from the Dyadic Sexual Regulation (DSR) scale (Catania, McDermott, Wood, 1984).

Initiative and satisfaction with frequency of sex. "On a scale from 1 (strongly agree) to 7 (strongly disagree), how do you agree or disagree to these statements about yourself?"

"I often take the initiative in beginning sexual activity"

"I have sexual relations with others as often as I desire"

In this study, we considered these questions relevant as a measure of how often one seeks sexual relations, and whether one experiences that the frequency of sexual relations is satisfactory, respectively.

Sociosexual Orientation Inventory (SOI)

The last seven items are taken from the Sociosexual Orientation Inventory (SOI). The SOI is a multi-item inventory developed by Simpson and Gangestad (1991) as a measure of individual differences in willingness to engage in uncommitted sexual relations. At one end of the SOI dimension are the individuals who possess a restricted sociosexual orientation (these individuals are likely to have few sexual partners and to be monogamous once mated), in the other end we find the individuals who exhibit unrestricted sociosexual orientation (these individuals have many sexual partners and are more likely to be unfaithful or commit acts of mate poaching; Schmitt, 2005). The SOI measure includes items that assess both behaviours and attitudes (Jackson & Kilpatrick, 2007; Penke & Asendorpf, 2008). Importantly, the causes and correlates of sociosexual behaviours and sociosexual attitudes are sometimes different depending on whether they are overt and covert (Penke & Asendorpf, 2008). Consequently, we focussed on differentiated facets of sociosexuality across overt and covert scales of sociosexual behavior and attitudes.

Three items assess individuals' *sexual overt behaviour*.

Number of partners in past year. "With how many different partners have you had sex within the past year?

Number of partners foreseen. "How many different partners do you foresee yourself having sex with during the next five years?"

Number of one-night stands. "With how many different partners have you had sex with on one and only one occasion?"

These questions were open-ended. Respondents were free to give any answer (number) they would like.

One item assesses individuals' *sexual covert behaviour*.

Frequency of sexual fantasy. "How often do you fantasize about having sex with someone other than your current (most recent) boyfriend/girlfriend/ partner?"

This item was answered on an 8-point scale indicating different time periods (e.g. 1= never, 4= once every two weeks, 8= at least once a day).

The last three statements assess individuals' *attitudes* toward engaging in causal, uncommitted sexual relations.

Attitudes toward casual, uncommitted sex index. "On a scale from 1 (strongly disagree) to 9 (strongly agree), do you agree or disagree to these statements?"

"Sex without love is OK"

"I can imagine myself being comfortable and enjoying causal sex with different partners"

"I would have to be closely attached to someone (both emotionally and psychologically) before I could feel comfortable and fully enjoy having sex with him or her"

The full SOI scale is calculated by reversing the last attitude item, and then averaging the attitude items. Then one averages the z-scores of the four first items and the z-score of the average attitude score (Simpson & Gangestad, 1991).

Results

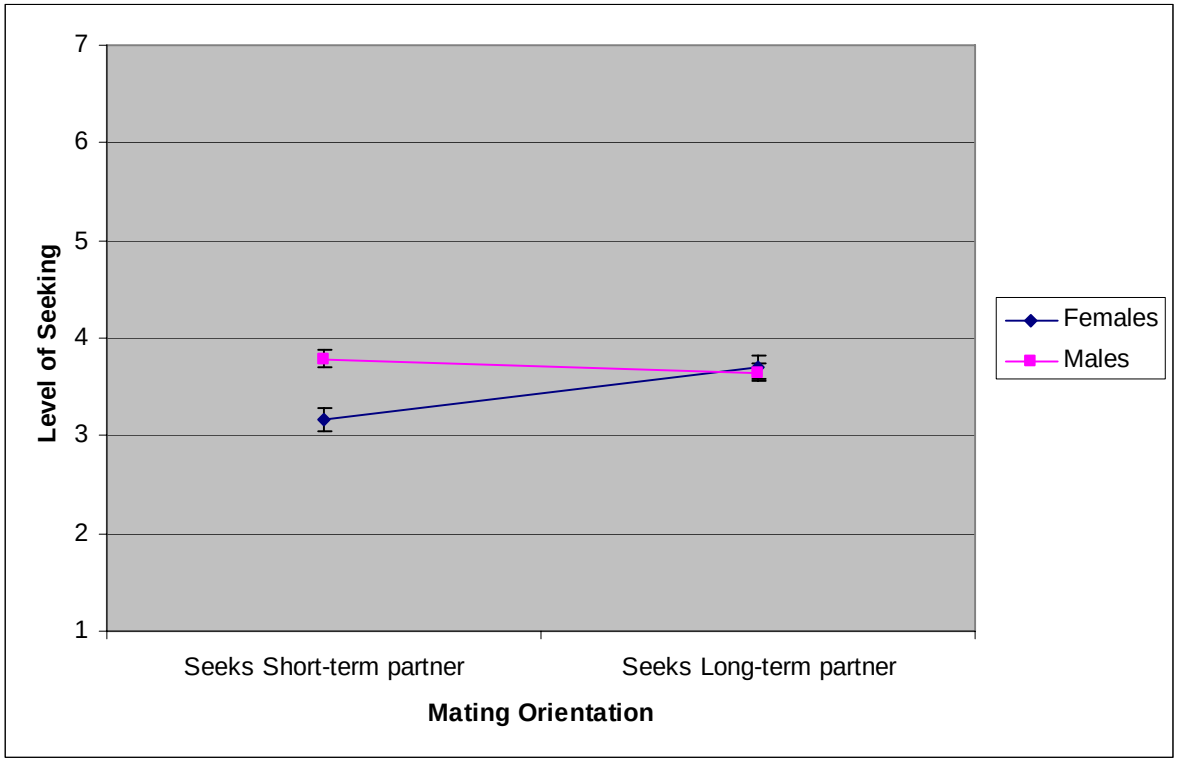
Numerous questions regarding the degree to which one seeks a long-term or short-term partner were answered differently by those in relationships – some indicated to what degree they were satisfied, others to what degree they were not looking for a *new* partner. Thus, key questions must be considered within contexts of whether or not participants are currently in a relationship. We report our results in the enumerated contexts of our nine hypotheses.

Hypothesis 1: We found that single men and women seek long-term partners to a similar degree (supporting Hypothesis 1; see Fig. 1). There is no significant difference (males, N=293, M= 3.65, SD=1.41; females, N=177, M= 3.69, SD= 1.56; $t(468)=0.31$, $p=0.76$, $d=0.0$)

Hypothesis 2: In support of Hypothesis 2, single males seek short-term partners to a significantly larger degree than single females (males, N=283, M= 3.79, SD=1.48; females, N=173, M= 3.16, SD= 1.64; $t(333.3)=-4.12$, $p<0.001$, $d=0.4$).

Whereas single males did not differ significantly in their interest in long-term or short-term partners, single females are significantly less interested in short-term partners (paired sample t-tests: males, $t(287)=-1,17$, $p=0.242$; females, $t(168)=3.13$, $p<0.01$).

Figure 1. Mating Orientations.

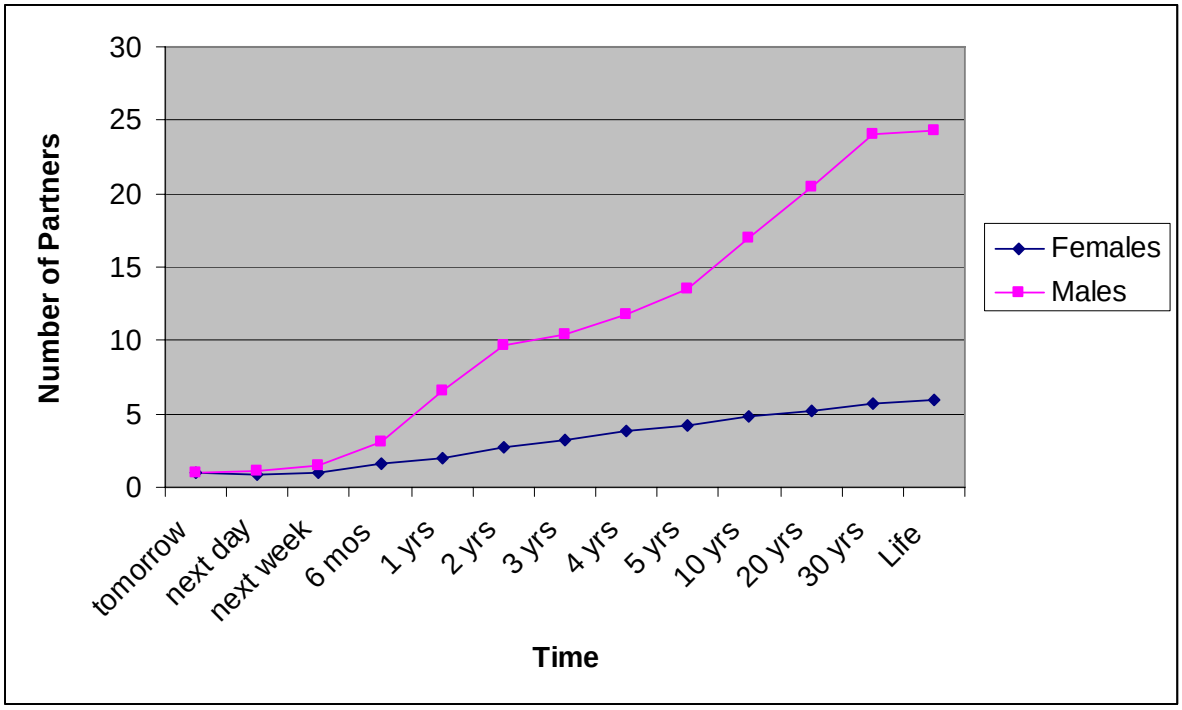


Note: Degree of seeking short-term and long-term partners rated from 1 Not at all currently seeking to 7 Strongly currently seeking.

Hypothesis 3: Men should possess a greater desire than women do for a variety of sexual partners. How many sexual partners one ideally desires differed significantly between the sexes with males desiring more partners from "Next week" ($t(741.97)=-3.40$, $p<0.001$) and onward,

supporting Hypothesis 3. All of the differences are significant (p<0.001). All subjects are included in analyses. See Fig. 2.

Figure 2. Number of partners desired across different time spans (means).



As Table 2 illustrates, both males and females have both long-term and short-term psychologies. Males are significantly more interested in variance from the day after tomorrow and throughout life. At the same time, females are interested in limited variance, and half of the females desire the possibility for more than one partner after a couple of years. Also the medians indicate that there are both sex differences, but also individual differences.

Table 2. Median number of partners desired, % that desires more than one for each time period, and Pearson's chi square for percentages wanting more than one sexual partner for each time period.

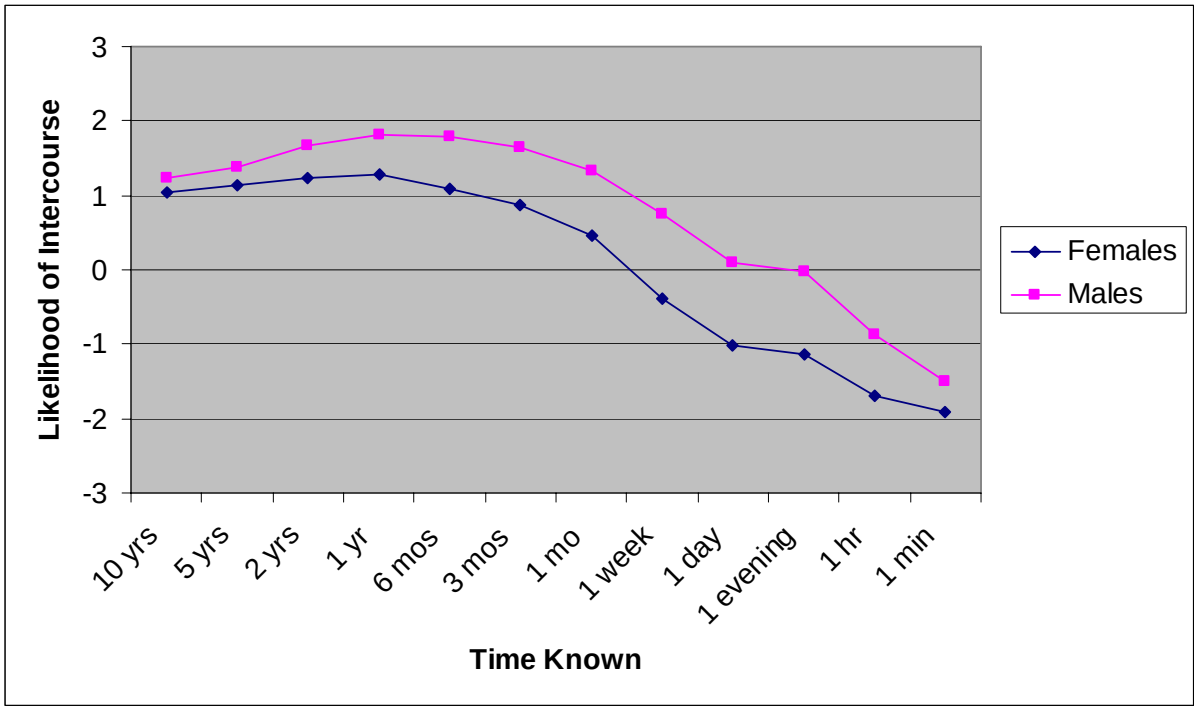
	Males			Females			χ^2	
	N	Median	% > 1	N	Median	% > 1		
Tomorrow	427	1	6,6	351	1	5,1	0.71	
Next day	414	1	11,1	341	1	6,2	5.67	*
Next week	424	1	20,5	340	1	7,9	23.51	***
6 mos	424	2	51,7	351	1	23,1	66.08	***
1 yr	427	2	59,3	341	1	32,8	53.01	***
2 yrs	410	3	67,1	331	1	45,3	35.44	***
3 yrs	393	4	68,7	326	2	52,8	19.12	***
4 yrs	387	5	68,5	321	2	53,6	16.47	***
5 yrs	386	5	69,2	318	2	54,7	15.57	***
10 yrs	385	6	68,8	319	3	57,1	10.44	**
20 yrs	384	7	68,5	317	3	57,1	9.70	**
30 yrs	383	7	68,4	317	3	57,7	8.54	**
Life	416	6	65,6	373	2	53,4	12.33	***

Note: *p<0.05, **p<0.01, ***p<0.001

Hypothesis 4: Men should require less time to elapse than women do before consenting to sexual intercourse. The time that lapses from one meets a hypothetical attractive partner until one will have intercourse with an attractive partner if circumstances allowed for it, differs significantly between the sexes, with males more interested in or willing to have sex after the shortest time interval (supporting Hypothesis 4).

T-tests show that males are more positive than females from having known the hypothetical attractive partner from 1 minute (t(1004)=-3.24, p<0.01) and onward until 5 years (p<0.001 from 1 hour till 2 yrs; p<0.05 at five years). The difference at 10 yrs is no longer significant (p=0.114), and for both sexes interest in having sex with someone one has known for more than a year tapers off. All subjects are included in analyses. See Fig. 3.

Figure 3. Likelihood of Intercourse.



Note: Each time interval is scored on a six point scale from definitely yes (3) to definitely not (-3).

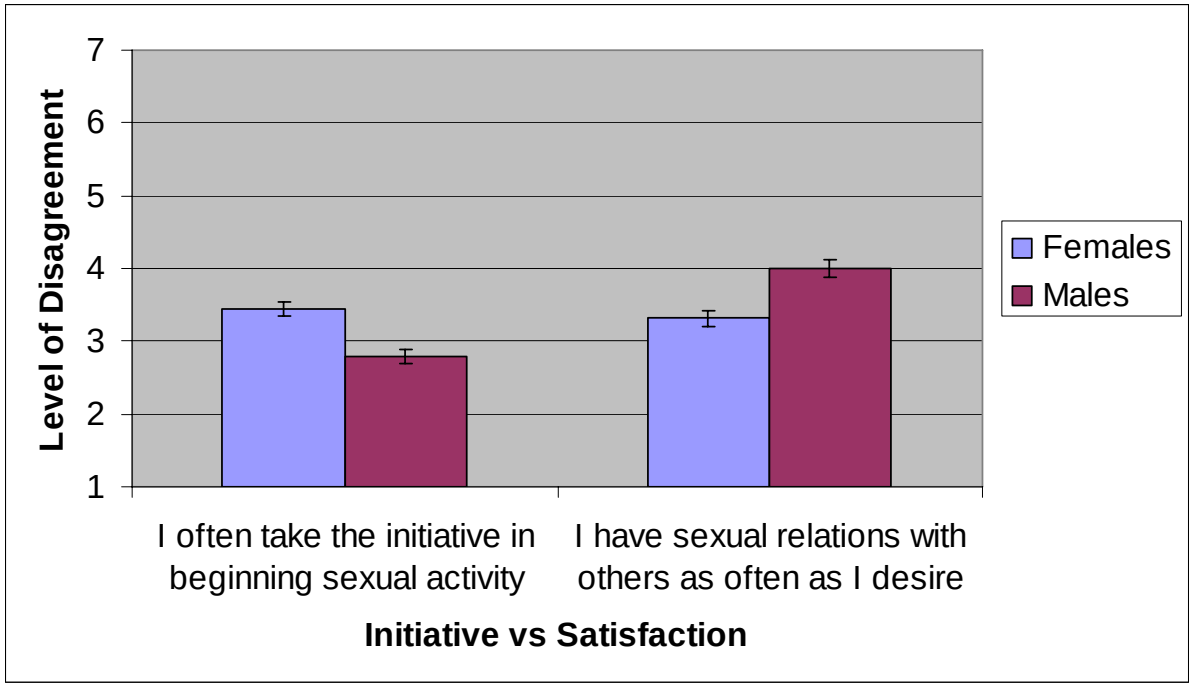
Hypothesis 5: If with a long-term partner, men should take the initiative more to have sex with their partner; *Hypothesis 6*: If with a long-term partner, men should be less satisfied with the frequency of sex within the relationship. Two questions considering initiative and motivation ("I often take the initiative in beginning sexual activity") and whether one has as much sex as one desires ("I have sexual relations with others as often as I desire") were considered mainly relevant for those dating or in relationships (married, engaged or cohabiting). The answers of those not in relationships and who have not had sex would probably contain noise – as they might be scoring current initiatives and satisfaction, rather than current and relevant behaviour.

Dating males and males in long-term relationships take the initiative in beginning sexual activity significantly more than females with similar relationship status, supporting Hypothesis 5 (males, N=206, M=2.80, SD=1.48; females, N=299, M=3.44, SD=1.51; $t(503)=4.79$, $p<0.001$, $d=0.4$).

Dating women and women in long-term relationships are more satisfied with how often they have sex than males with similar relationship status, supporting Hypothesis 6 (males, N=207, M=4.00, SD=1.82; females, N=294, M=3.32, SD=1.90; $t(499)=-4.01$, $p<0.001$, $d=0.4$).

In other words, women in relationships take less initiative to sex, but are at the same time more satisfied with the amount of sex they have – the opposite is true for men. There was a significant difference in males' ratings of initiative versus satisfaction with frequency (paired samples, $t(205)=-8.46$, $p<0.001$), there was no difference for women ($p=0.392$). See Fig. 4.

Figure 4. Initiative in beginning sexual activity versus Satisfaction with frequency of sexual relations.



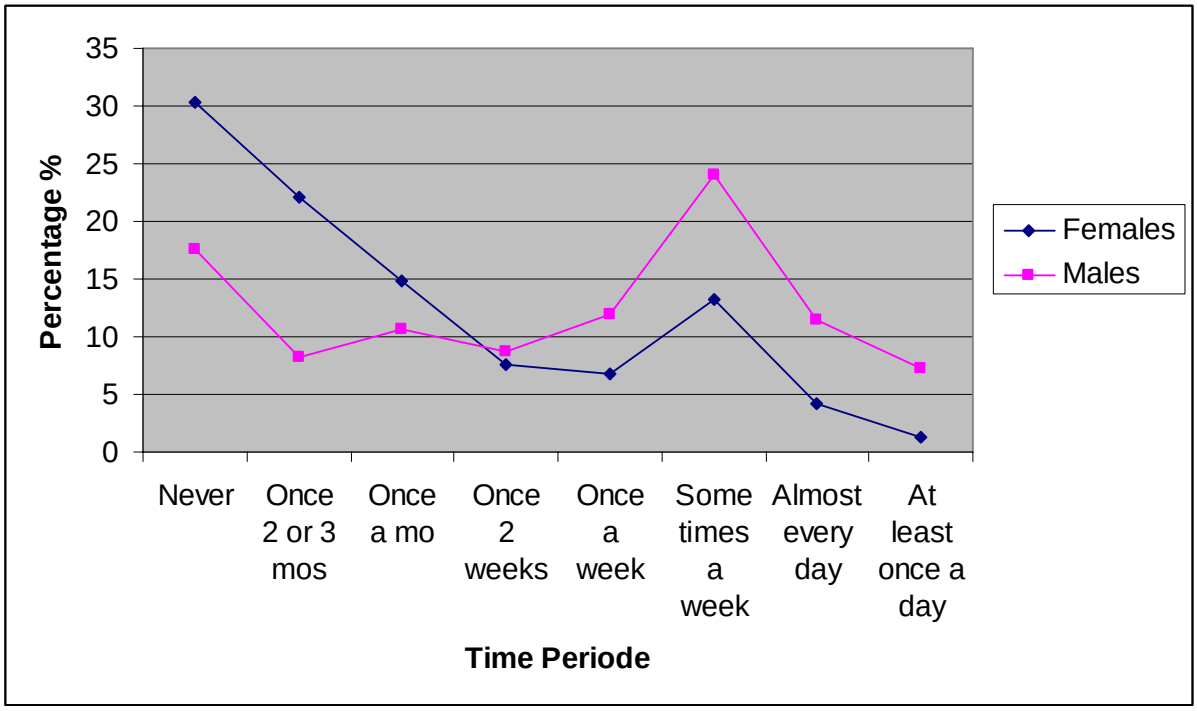
Note: Scale is rated from 1 (Strongly Agrees with statement) to 7 (Strongly Disagrees with statement) – higher scores therefore indicate disagreement with statements.

Hypothesis 7: Men should fantasize about sex with someone other than their current partner more than women do. One of the questions of the SOI asks how often one fantasises about having sex with someone other than one's current (most recent) girlfriend/ boyfriend/ partner. Those who have not had sexual relationships were excluded from the analysis. The percentage of females (N= 386) and males (N=411) that engage in such fantasies are presented in Fig. 5.

About 30% of females never engage in such fantasies versus only 17.5% of the males, supporting Hypothesis 7. On the other hand, while only a quarter of the females report such fantasies once a week or more often, more than half of the males report having sexual fantasies

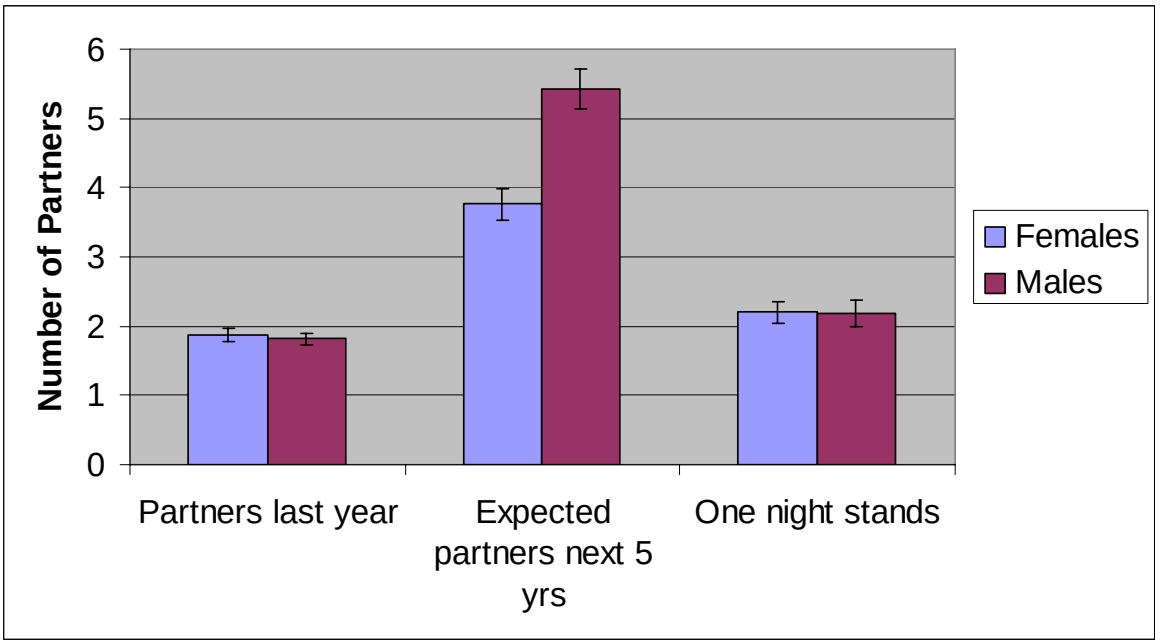
about someone other than their partner in the same period. About 7% of the males have such fantasies every day versus only 1 percent of the females. The most frequent response for females was never, the most frequent response for males was some times a week. These findings confirm previous results suggesting that the largest sex differences in short-term mating psychology occur within very brief temporal contexts (McBurney et al., 2005), with men especially willing to sexually engage both behaviourally and in fantasy with strangers (Clark & Hatfield, 1989).

Figure 5. Percentage of females and males who have sexual fantasies about others than current (or recent) partner.



Hypothesis 8: Men and women should not differ in the number of past sexual partners. The SOI further asks how many different partners one has had intercourse with the last year, how many different partners one believes one will have intercourse with the next five years and how many different partners one has had intercourse with only the one time. Fig. 6 presents the results for subjects who have had sex.

Figure 6. Number of sexual partners last year, expected sexual partners next 5 years and one night stands.



Note: While two numbers are historical partners and is a report of behaviour, the expected number of partners is a prediction about future behaviour – and probably includes a certain element of desire as well as other biases indicating beliefs about own tendencies to engage in behaviour and success in actually achieving desires (wishful thinking).

As Fig. 6 shows the numbers of reported sexual partners the last year and number of one night stands were almost perfectly similar, supporting Hypothesis 8. In general in the literature these numbers tend to differ, with males reporting more partners – but in overlapping mating populations the numbers ought to be similar.

There was a significant sex difference in the reported expected number of partners the next five years, with males expecting to have significantly more sexual partners than females (males, N=407, M=5.42, SD=5.81; females, N=381, M=3.76, SD=4.50; $t(759.89)= -4.50$, $p<0.001$, $d=0.3$).

Hypothesis 9: Men should possess more positive attitudes toward unrestricted, low commitment sex than women do; that is, they should on average have a more unrestricted sociosexuality than women do. The last three items from the SOI asks about attitudes about sex without love and the respondents' ability to enjoy casual sex with different partners and need for emotional attachment when having sex (See Table 2).

There were sex differences in the agreement with all of these three statements, indicating that males in general have less restricted sociosexuality – are more interested in sex without emotional attachment, in one night stands, or extra pair sex – than females, supporting Hypothesis 9 (see Table 2). All cases were included, as the responses are relevant for all subjects.

Table 3. Sex Differences in Sociosexuality.

	Females			Males						
	N	M	SD	N	M	SD	t	df	p	*d*
Sex without love is OK	492	5.20	2.59	527	5.61	2.55	-2.58	1017	0.010	-0.2
I can imagine myself being comfortable and enjoying casual sex with different partners	491	3.55	2.41	522	5.01	2.39	-9.64	1011	0.000	-0.6
I would have to be closely attached to someone (both emotionally and psychologically) before I could feel comfortable and fully enjoy having sex with him or her	493	5.50	2.61	523	4.74	2.51	4.76	1014	0.000	0.3

Note: last statement is reversed compared to the first two statements – higher agreement indicates more restricted sociosexuality, while higher agreement on the first two indicates less restricted sociosexuality.

Hypothesis 9 may be further addressed by considering the SOI as a scale. There was a significant difference between males and females for the full SOI scale (males, N=510, M=0.07, SD=0.58; females, N=488, M=-0.13, SD=0.54; $t(996)= -5.53$, $p<0.001$, $d=0.3$).

Discussion

We expected to observe a specific pattern of sex differences in our sample of young Norwegian students, as predicted by Sexual Strategies Theory, thus replicating findings from Buss and Schmitt (1993) and Schmitt (2005). Namely, men tend to possess a greater desire than women do for a variety of sexual partners, to require less time to elapse than women do before consenting to sexual intercourse, and to more actively seek short-term mateships than women do. The alternative hypotheses would be that there would be no or dramatically reduced sex differences in sexuality in relatively egalitarian Norway (Eagly & Wood, 1999), or that the pattern of differences would be unsystematic and not predicted by evolutionary middle-level theories (Lorentzen, 2004). Evolutionary perspectives were supported at every turn, and alternative hypotheses were decidedly refuted by the current findings.

First, no sex differences in single subjects' interest in long-term partners were evident (supporting Hypothesis 1). It is not the case than men are somehow unmotivated to pursue long-term mating. Instead, both men and women are motivated to pursue long-term pairbonds under specific contexts (Schmitt, 2005). It is worth noting that all research on male sexual jealousy must be founded on an assumption of some degree of male commitment in child-rearing long-term partnerships.

On the other hand, we found a reduced female interest in short-term relationships, as predicted by Hypothesis 2. It is not the case that women are completely unmotivated to pursue short-term mating. Instead, women are motivated to pursue short-term mates under a relatively limited array of contexts (e.g., when mated to a low quality mate and experiencing the fertile phase of their ovulatory cycle; Haselton & Gangestad, 2006). Males, on the other hand, are expected to pursue short-term mating strategies in a wider array of contexts (Fenigstein & Preston, 2007; Schmitt et al., 2004).

Consequently, we found that males and females differed significantly in the number of sexual partners if they would wish for if they could "ideally" have as many as their heart and loins desired (supporting Hypothesis 3; see also). We removed the extreme scores from the dataset – all of these extreme scores were male, thus the differences might actually be larger. Certainly, the relationship and courtship dynamics of men and women could be differentially affected by extreme scoring males who seek out large numbers of partners.

Males were more likely to wish to engage in sex than females after shorter periods of time (supporting Hypothesis 4). This confirms earlier work, including Clark and Hatfield (1989) and Buss and Schmitt (1993). Obviously many females actually do engage in sex earlier than these responses indicate – contextual factors, alcohol and more emotionally eliciting cues will modulate behaviour. It is important to consider that more critical to potential partners does not mean no interest in sex – even short-term sex. Why women engage in extremely short-term sex has been difficult to explain from early evolutionary perspectives, though recent theories have been developed focusing on women's use of brief short-term sex as a means of gaining access to high quality genes that they might not otherwise ever have access to (Haselton & Gangestad, 2006).

Males in couples take more initiative to sex than females (supporting Hypothesis 5), but are less satisfied with the frequency of sex (supporting Hypothesis 6). This is especially interesting, given that there are no obvious relevant cultural forces that should limit modern, young Norwegian females' interest in having sex, expressing their desire, or being more satisfied with less sex than their male partners.

Males fantasised about more partners (supporting Hypothesis 7), and reported a significantly more unrestricted sociosexuality than females (supporting Hypothesis 9). Males, as a group, seek and wish for sex with a lower need for emotional commitment, love, or intimacy.

An interesting and unusual finding is that the number of partners was almost perfectly similar between the sexes (supporting Hypothesis 8). One might conclude that this is what one ought to find, and that this suggests that our subjects have been truthful to the degree to which they estimate their past number of sexual partners (Brown & Sinclair, 1999). Objectively, however, this may only be the case if the two sexes are overlapping heterosexual mating populations. The

similarity may therefore be due to the effects of reporting biases, or due to the responses being both truthful and representative of the larger population (Wiederman, 1997).

But behavioural similarity does not say anything about the relative desire in either of the sexes. Thus one might claim that the difference is psychological (emotional/motivational) rather than behavioural (number of partners). Actually, the fact that we get similar behaviour measures suggests that our sample is overlapping (and may be compared) and/or nonbiased (not influenced by difference generating gender roles). Given Jonason & Fisher (2009) this might mean that our sample is less influenced by the biases found in their population – providing further evidence of the cultural difference between Norway and the US. Despite this we find differences predicted by SST, but not predicted by Eagly & Wood (1999) .Most of our other data suggest that there would be more sex and more casual sex if male preferences were not regulated by female behaviour. But there would still be a necessary behaviour similarity in average between the sexes.

An interesting point is how both females and males expect to have less sex the next five years than they have. However, while males expect more partners than females do (and this may also reflect increased desire for variety; see Hypothesis 3), they reduce the numbers compared to what they ideally would have desired after 5 year. Females, however, desire and expect almost the same number of partners. The data suggest that as the two sexes will be having as much sex on average, the females will be setting the limits, and their estimate might therefore be more accurate. As early evolutionary psychologists have explained, sexually willing females are a limited resource about which males must compete (Symons, 1979).

Summarising the findings one conclusion seems clear: All of the major sex differences predicted by parental investment theory and Sexual Strategies Theory were replicated; each test was statistically significant in the expected direction within Norwegian samples. This is evidence of robustness. One may not conclude that Trivers' parental investment theory and the related predictions from Sexual Strategies Theory are the *only* explanation – but this specific middle-level theory has clearly proven to have predictive power across species (even in cases where the male is the higher investing species and females compete for access to sexually willing males, such as katydids and seahorses). It is not being a specific sex that leads to this mating behavior predictions

– it is the amount of investment the sexes of a given species typically make in offspring throughout the species' evolutionary history that leads to mating behavior predictions. In humans, this is even true in populations that are highly progressive, secular, and gender egalitarian (Bjerke et al., 1989; United Nations Development Programme, 1997; Williams & Best, 1990; Williams et al., 1979; Zuckerman, 2007).

As such, the evolutionary predictive theories have gained critical additional support in this study. The position that there are no differences in desire, fantasy, or attitudes is weakened. This study neither suggests that culture influences the currently studied differences to such a large degree that they were not still very clear, systematic, and predictable differences. Individual variance reduces some of the differences, but there are predictable and replicable sex differences. It is not obvious what cultural influences should have created the response differences in our sample – but it is quite possible that the individual differences in part are due to cultural factors. One might of course suggest that despite the cultural differences between Norway and e.g. the US, Norwegians may still have similar gender identity expectations. This is possible, and must be addressed by research. How these arise, and why they are cross-culturally predictable by SST, are issues further research may consider. At this point it is important to note that Norwegian culture did not reduce the predictive power of SST, as suggested by Eagly and Wood (1999). The question would therefore be why culture does not change gender identity expectations. Adding the fact that our population was able to provide unbiased answers about how many partners they have had, it is less likely their other answers were biased. The fascinating point here is that there may be convergence between gender researchers and evolutionary psychologists. We now know SST does predict, now we need to understand why. May it be that gender identity may be a relevant proximate explanatory level, which also may be considered fruitfully and predicted by an evolutionary perspective? There is no reason to conclude a priori that these two approaches are mutually exclusive (Buss & Malamuth, 1996; Vandermassen, 2005).

The position that culture may modulate responses is still reasonable, and that such effects primarily influence the expression of evolved mechanisms – primarily through the ecological contexts such cultural factors may create. In a more sexually liberal culture individual differences

in sociosexual orientation and short-term mating (Simpson & Gangestad, 2001) might be more easily expressed. However, the group means differ systematically – also probably due to the effects of mammalian biology on sex typical sociosexual orientation (Schmitt, 2005).

It is important to note that the current findings show that desires for short-term mating and sociosexuality differs considerably within sex. Many men and women desire short-term sex, fantasize about infidelity, and want to engage in one-night stands. However, males tend to desire, fantasize, and want to engage in short-term sex more than women do.

Clinical consequences

From the clinical perspective there are a few points worth discussing. First, individual differences exist and one cannot and may not argue that absolutely no human female ever has, e.g., more sexual fantasies or more interest in short-term partners than a typical male does. On the other hand, group averages provide the best information about what is likely or typical for a member of that specific group. It is worth noting the large overlap of the samples, and limited effect sizes, on some of the measures – albeit there are also large differences, and the pattern is systematic. Thus, while there are large individual differences, the sex differences we report do say something about likely and typical male and female desires.

There should be no values derived from the current findings; this study is not normative and does not consider what young people *ought* to feel or not, or do or not. The critique that one may be creating or conserving differences that do not exist between the sexes, according to many theorists critical of biology, must be considered less relevant given the rigorous pattern of these results. These differences do exist, on average, and need to be explained with deep theorizing that integrates what we know about humans with what we know about the rest of the natural world. Trivers' parental investment theory (1972) provides such an explanation.

Importantly, one should seriously consider the effects of continuing to make claims that are not reasonable based on the extant empirical evidence. Continuing to claim that there are no significant, predictable sex differences in sexual desire, fantasy, or attitude does a disservice to the truth, and will only generate attitudes of distrust and violation from those who in time come to

learn the actual evidence. According to this study and the overwhelming weight of the evidence, it is clear: there *are* sex differences. In everyday life, people continue to be exposed to these differences and only an honest approach to the expression of sex differences will allow us to fully understand them.

From a clinical perspective, it is worrisome to consider the effects of claims that there are no differences, when indeed there are, have on the emotional climate of couples experiencing differences. In such cases, experts claiming that there are no differences will be inducing guilt and shame in females, and doubt and worry in males, and increase the number of couples experiencing differences in sexual desire that believe there is something wrong in their relationship. Thereby ideological claims of similarity aimed at not suppressing female sexuality, might be causing females to feel pressure into having sex they do not desire.

Conversely, the increasing evidence of women's natural short-term mating desires may benefit therapists looking to bring insight and self-awareness among their clients. Although women's short-term mating desires tend to focus on masculine and dominant men (not on large numbers of indiscriminate partners; Gangestad, 2001), to deny a scientific understanding of such desires in women would be just as inappropriate as denying the sex differences evident in this study.

Conclusions and further research

Sexual Strategies Theory predicts specific sex differences in sexual behaviour and attitudes. The prior empirically documented differences were fully replicated and expanded in the current study. Further research may attempt to further specify the contextual factors that influence different responses – including factors that regulate sexual desire in couples. Also more research into individual differences may be of interest with theoretical developments. It is worth noting that this area needs a multi-disciplinary approach, and that there is no reason why gender researchers should be sceptical of evolutionary approaches (e.g. Vandermassen, 2005). There are at least two lines of common interest between feminists, Darwinian feminists and gender researchers and evolutionary psychologists: 1) The mutually acknowledged power differential between the sexes is one area where evolutionary psychologists and feminists have a converging scientific

interest (Buss & Malamuth, 1996). 2) Sexual selection as an explanatory and predictive process relevant for the understanding of sexuality and sex differences (e.g. Vandermassen, 2004). Future development of our knowledge of sex differences and similarities and the effects of biology and culture on sexual desire, attitudes and behaviour depends on a coordinated multidisciplinary research effort.

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