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Disco Clothing, Female Sexual Motivation, and Relationship Status: Is She Dressed to Impress?

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The relationship between a female's clothing choice, sexual motivation, hormone levels, and partnership status (single or not single, partner present or not present) was analyzed in 351 females attending Austrian discotheques. We digitally analyzed clothing choice to determine the amount of skin display, sheerness, and clothing tightness. Participants self-reported sexual motivation, and we assessed estradiol and testosterone levels through saliva sampling. Results show that females are aware of the social signal function of their clothing and that they in some cases alter their clothing style to match their courtship motivation. In particular, sheer clothing—although rare in the study—positively correlated with the motivation for sex. Hormone levels influenced clothing choice in many groups, with testosterone levels correlating positively with physique display. In females who had a partner but were at the disco unaccompanied by the partner, estradiol levels correlated positively with skin display and clothing tightness. Significant differences were not found, however, for clothing choice across the partnership-status groups.

Evolutionary theory explains sex differences in sexuality and mate selection criteria in terms of different levels of parental investment (Symons, 1979; Trivers, 1972). For women, the minimum required parental investment is greater than it is for men. A copulation that requires minimal male investment can produce a 9-month investment for the woman that is substantial in terms of time, energy, resources, and foreclosed alternatives. As a result, women will tend to be more discriminating in their choice of a mating partner and will be less interested in short-term relationships than will men. Women will prefer characteristics in potential mates that signal the possession or likely acquisition of resources that could aid them and any potential offspring in the long term (Buss, 1988; Buss & Schmitt, 1993).

Men, in contrast, will tend toward a different strategy. Since males' necessary investment is minimal, men can afford to be less choosy when it comes to mating partners. Men will be interested in a variety of short-term partners, will be more open to low-investment sexual opportunity, and will tend to focus on cues signaling fertility and reproductive health rather than resource-acquisition skills (Townsend & Levy, 1990). Since female fertility is limited by health and age, male sexual attraction will primarily be attached to visual stimuli such as muscle tone, facial and body proportions, and absence of wrinkles. The existence of these mate selection tendencies has been demonstrated many times (Cunningham, 1986; Singh, 1993; Townsend, 1989; Townsend, Kline, & Wasserman, 1995).

The consequences of male versus female minimal parental investment can also be seen in present-day sex motivation systems. Males have a lower threshold for sexual excitation (Rubin, 1970), tend to perceive people and relationships in a more sexualized manner (Abbey, 1982), and are more likely to interpret a variety of stimuli as signals of sexual intent (see Gross, 1978; Kanin, 1969). Since low-investment copulation was advantageous for males in our evolutionary past, males are predisposed to attend carefully to potential sexual cues and be on the lookout for any signals that might indicate varying degrees of sexual openness.

Alternative Reproductive Strategies

In Westernized societies the mating system is presumptively monogamous, but research shows that it is probably more accurate to describe our mating system as one of *serial polygamy*: Successive marriages and mating outside of marriage and committed relationships are common (Buss & Barnes, 1986). Estimates based on DNA evidence suggest that 9% to 13% of children have putative fathers that are not their genetic fathers (Baker & Bellis, 1995). Adultery among married couples is estimated to range from 26% to 70% for women and from 33% to 75% for men (Hite, 1976; Kinsey, Pomeroy, Martin, & Gebhard, 1953; Symons, 1979).

To maximize our reproductive success, it makes sense that evolution has outfitted both males and females with several possible mating strategies. For males, a dual sexual strategy is likely to have been most profitable in the evolutionary past: Invest in offspring with a female who has been selected for fertility and fidelity, but take advantage of any other low-investment mating opportunities that come along. Signals of fidelity and sexual restraint will be of value in a long-term partner, as this will help to increase a male's confidence of paternity in invested offspring. Signals of sexual openness, on the other hand, will be of value in a short-term partner.

For females, the main sexual strategy will be to carefully select a mate with whom a long-term, committed relation-

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ship can be established, and from whom resources for potential offspring in the future can be secured. Mating outside a committed relationship (*extra-pair copulations* or EPCs) with a carefully selected male could, however, also be an adaptive mating strategy for a female for the following reasons: The simultaneous competition of the sperm from two different males for the fertilization of the egg will provide for increased genetic quality in the offspring, genetic variability among a female's offspring will enhance inclusive fitness and survival prospects, the female can increase her prospect of acquiring a better mate, and the female can benefit from immediate resource accrual provided by her EPC partners (Gangestad & Thornhill, 1998; Pound, 1998; Symons, 1979; for a review of additional hypothesized benefits see Greiling & Buss, 2000).

Recent research has shown that a female's ovulation status may influence her mating strategy, a finding which suggests that the pursuit of EPC strategies may be a special-purpose adaptive design for females (Thornhill & Gangestad, 2003). Penton-Voak and Perrett (1999) found that females' preferences for male facial attributes change as a function of their menstrual phase. When a female is in her most fertile phase, her preferences shift toward more masculinized faces. Similar results have also been found by Penton-Voak and Perrett (2000) and Johnston, Hagel, Franklin, Fink, and Grammer (2001). The authors interpret their findings as evidence for a conditional mate choice strategy whereby females in a high conception phase of their menstrual cycle exhibit a stronger preference for male facial cues that signal adaptive heritable genetic characteristics, such as immunocompetence. This shift for different mate preferences at ovulation coincides with an increase in females' self-reported arousal to sexual stimuli (Luschen & Pierce, 1972), peaks in sexual receptivity (Adams, Gold, & Burt, 1978), and an increased amount of attraction to and fantasy about men who are not their primary partners. It also coincides with an increase in females' extra-pair copulation frequency (Baker & Bellis, 1995) and an increase in mate guarding by a primary partner (Gangestad, Thornhill, & Garver, 2002), findings which suggest a sperm competition theory of double-mating behaviors.

It appears that it is not only males who respond to short-term mating opportunities, but females as well. The timing of women's interest in and fantasy about non-partner men as well as the timing of their actual EPC behavior is evidence that women have a psychological adaptation that assesses circumstances and motivates them when EPC can be best realized (at fertile cycle times; Thornhill & Gangestad, 2003).

Such findings take us a step further in our understanding of the mechanisms that underlie female sexual motivation and sexual strategy. An important next step would be to see how partnership status, hormone levels, and sexual motivation interact with female sexual signaling in actual courtship contexts. We know that females have a hormonally mediated mechanism that influences mate attraction. From self-report and genetic testing, we also know that extra-pair copulation is common. What we don't know, however, is how female mating strategies in general are manifested in real-life settings.

Female Clothing as a Sexual Signal

We hypothesized that one potential source for female sexual-strategy signaling in courtship contexts is clothing. Research on impression formation has long demonstrated that people tend to draw inferences about the personal characteristics of others based upon outward appearance (for a review see Jackson, 1992). Stable judgments about a person's character and capabilities are often made within a 100-millisecond glance (Goffman, 1959; Locher, Unger, Sociedade, & Wahl, 1993).

In courtship settings, clothing (or body parts emphasized through a specific lack of clothing) receives preferential attention in person-perception assessments. Santin (1995) investigated the relationship between a target's clothing and an observer's glancing. Analysis of eye movements found that areas of bare-skin display attracted preferential male attention. When looking at a female target, males' eye contact focused first on the head and shoulder area. From there, if a target had bare shoulders, males directed eye contact to all other areas of bare-skin display before moving on to clothing-covered areas. This suggests that skin display is tallied and given preferential attention before any other areas of the body are assessed.

In Santin's study, female targets who were wearing tight clothing and displaying more skin were rated by males as sexier than females wearing less-revealing clothing. Abbey (1987) and Hill (1984) also manipulated skin display and clothing tightness on female models to see what affect this had on male's ratings of attractiveness. Female models who accentuated their bodies were found to be more attractive as sexual partners. However, accentuating her body decreased a female's attractiveness as a marital partner (Hill, Nocks, & Gardener, 1987). This double standard makes sense when viewed from an evolutionary perspective. In a long-term relationship, males will value signals of sexual restraint in a partner. Thus, males use a female's clothing as an indicator for whether the female is following a long- or short-term sexual strategy.

Correlational research by Barber (1999) also suggests that clothing and skin display serve as particular reproductive signals. An analysis of dress fashion data and societal demographics extending from 1885 to 1976 found that shortening skirt length tends to correlate with low sex ratios (indicating limited marital opportunity for women), with increased economic opportunities for women, and with marital instability. This suggests that alternative reproductive strategies may exist for women in which they can vary the relative importance of careers and marriages depending on the economic consequence of each, and a correlate may be the extent to which one uses clothing to accentuate sexuality. A key question, then, is whether women—from a sender's perspective—understand that their clothing choices are interpreted as sexual signals.

Abbey (1987) has pointed out that males often misinterpret female signals.

With the current study, we aimed to explore the sexual signal value of female clothing by being the first to examine female clothing choice, relationship status, hormonal status, and reported sexual motivation in actual courtship contexts. Three conditions were explored: (a) females in a relationship visiting a disco without the accompaniment of their partners ("partner absent"), (b) females in a relationship visiting a disco with their partners ("partner present"), and (c) females not in a relationship visiting a disco ("single"). In addition, we explored the effect of hormonal contraceptives (for ease of labeling, called "pill taker" vs. "no pill") on sexual motivation and clothing style. This created a total of six conditions (see Table 1).

Predictions

Reported Motivation

Does clothing choice relate to sexual motivation? Since males consider female clothing to be a courtship signal, it seems logical that females also understand that clothing can be used as a courtship communication tool. We hypothesized that women who are wearing tighter or more revealing clothing will report greater sexual motivation than females wearing looser, less revealing clothing. It was also predicted that women who are wearing tighter or more revealing clothing will report feeling sexier than females wearing looser, less revealing clothing.

Hormone Levels

Female sexual motivation is highest at the time of ovulation (Adams, Gold, & Burt, 1978; Baker & Bellis, 1995); thus, we predicted that clothing tightness and skin display would positively correlate with estradiol level. Predictions for testosterone are more difficult. Research on males has shown that testosterone increases sexual motivation, but this effect and the effect of testosterone on the menstrual cycle is less clear in females (Bancroft, 2002). Research on females with diminished sex drive has shown that treatment with testosterone increases sexual desire, sexual arousal, and the number of sexual fantasies (Sherwin, Gelfand, & Brender, 1985; Shifren, Braunstein, Simon, Buster, & Redmond, 2000). A relationship between female risk taking and testosterone has also been shown. With increasing testosterone levels, females are more willing to take risks and more interested in seeking new stimulations (Rako, 1999). To that extent, it may be predicted that testosterone levels will also have an effect on females' reported sexual motivation, correlating positively with clothing tightness and skin display.

As an exploratory measure, we also analyzed the relationship between the use of oral contraceptives and reported sexual motivation and physique display. Previous studies have shown that taking oral contraceptives affects women's preferences for male pheromones (Grammer, 1993) and male facial features (Johnston et al., 2001). In the current study, this measure was exploratory.

Interactions Between Relationship Status, Hormone Levels, and Sexual Signaling

Bellis and Baker (1990) found that EPCs occur most frequently during the time of ovulation, when females are most fertile. Following this finding, we hypothesized that non-pill-taking females who are involved in a partnership but are at the disco unaccompanied by the partner will more often have higher estradiol levels than the other groups. In addition, sexual signaling through skin display and clothing tightness should be highest in this group. Predictions for single, non-pill-taking females are less clear. In this group, we do not necessarily expect a correlation between estradiol and physique display. While single females may have an interest in attracting a partner, high signaling may be a disadvantage as it may attract the wrong type of partners (men who are only interested in short-term relationships), thereby limiting the women's ability to choose. In addition, in single, non-pill-taking women, there is an increase of risk by possible conception at ovulation because there is no primary partner with whom investment is secured.

Risk is an important topic when it comes to signaling. For females who are in a partnership, ovulatory shifts toward extra-pair copulations could be triggered by a general change in females' tendency to be involved in more risky behavior. According to Gangestad et al. (2002), men appear to respond to peak conception risk in a primary partner by increasing mate guarding and the psychologically mediated response of jealousy. If they pursue an EPC strategy, females run a high risk of losing their primary partners' investment in offspring, as males are aversive to such strategies (Gangestad et al., 2002), and research has shown that males are less likely to invest in children when paternity is uncertain (Anderson, Kaplan, & Lancaster, 1999). Thus, a general tendency toward extra-pair copulation should be accompanied by an increase in risk taking and sensation seeking, potentially tied to testosterone peaks. Following this logic, we expect that testosterone will positively correlate with physique display and sexual motivation, especially in females who are at a disco without the accompaniment of their primary partner.

Method

Participants and Procedure

Data collection sessions occurred at five different discotheques in Vienna, Austria. The discotheque setting was chosen because it is a location where males and females are likely to come into contact with one another in a mate-choice context. At all locations, data were collected between 9:00 p.m. and 3:00 a.m., each on evenings with similar weather conditions.

Three hundred fifty-one females participated in the study (See Table 1). As females entered the disco area, a

Table 1. Female Subjects: Relationship Status and Use of Contraceptives (Pill)

Females	Mean age	*SD*	*N*
Partner present-pill	21.6	2.8	40
Partner present-no pill	23.2	3.5	24
Partner absent-pill	21.4	3.3	69
Partner absent-no pill	21.8	3.7	48
Single-pill	21.2	2.8	57
Single-no pill	20.5	3.7	113

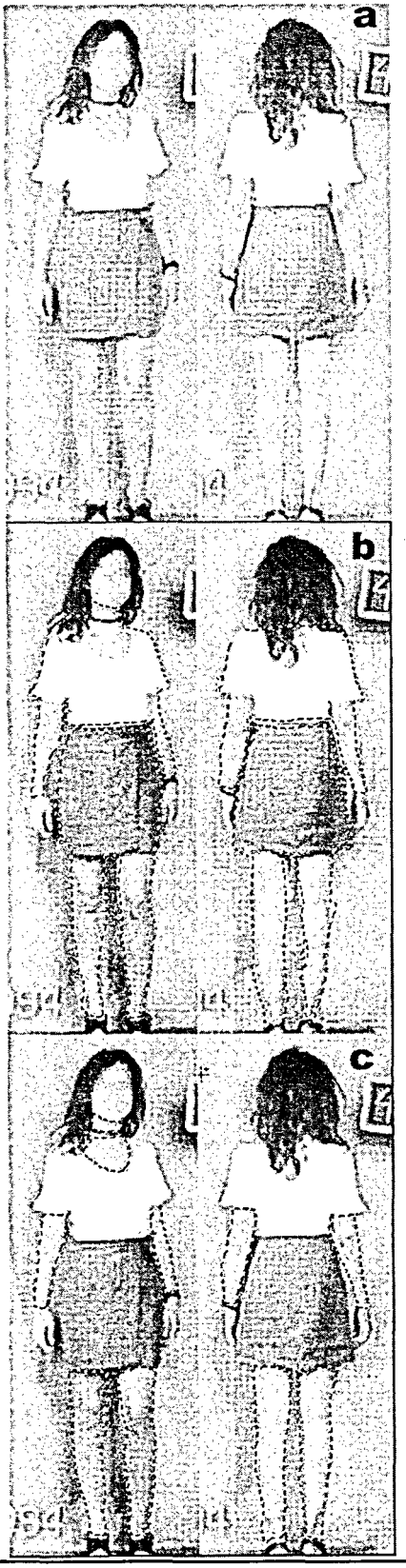
student confederate asked them if they would participate in a study on fashion. Participants were assigned a number and led to the data collection area, where a video photograph was taken of them in a standardized body posture, first facing forward, then facing backward (see Figure 1a). After the photograph, participants provided saliva samples with Eppendorf vials. Following the saliva sample, participants filled out a questionnaire regarding demographic data, use of hormonal contraceptives, relationship status, and a question asking if they were or were not accompanied by their partner at the event. Additionally, participants were asked to evaluate their motivation at the event ("What do you expect from this event?") with a 7-point Likert rating on four options: "hang around," "meet new people," "flirt," and "sexual intercourse." They were also asked to describe their outfits on a 7-point Likert scale rating four options: natural, modest, bold, and sexy. All participants filled out an informed consent form and were debriefed after the data collection session.

Measures

Saliva Samples and Hormone Analysis

Participants were asked to spit into 1.5 ml Eppendorf vials until 300 µl of saliva had been collected. Samples were temporarily stored in an iced cooler box, then immediately frozen at -28° C. Immunoreactive testosterone and estrogen equivalents were assayed from the 35-µl saliva samples by enzyme immunoassay (EIA). Before assay, 200-µl samples from the supernatants were extracted with 4-ml Diethyl ether and reconstituted in buffer. Extraction recoveries of both androgens and estrogens varied slightly among samples for both steroids between 85% and 90%. For testosterone, a group-specific antibody against 4-androstene-17-β-ol-3-on-carboxymethyloxine—rabbit albumin—was used with a 5α-androstan-3β, 17β-diol-3-hemisuccinate label (see Palme & Möstl, 1993). We mixed 35 µl/15 µl sample/buffer aliquots for the assay determinations. A group-specific assay was also employed for estrogen measurements as described by Möstl, Meyer, Bamberg, and von Hegel (1987). Using an antiserum against 1,3,5 (10)-estratriene-3,17β-diol 17 HS:BSA., 50-µl salival aliquots were used in this assay. Cross reactivities of these antisera are described in Palme and Möstl (1993). The samples in both assays were analyzed in duplicate and in a single assay for each steroid. Intra-assay variation was maintained below 10%.

Figure 1. Digital clothing analysis: Photograph *a* shows the original photo; photograph *b* shows the body outline (total of 65,767 pixels body surface); photograph *c* shows the measured parts for skin display (25,080 pixels of skin display or 38.1% of the body surface).



Dress Analysis

To analyze the clothing of each participant, video-photographs were digitized to a grayscale picture (Figure 1a) and then loaded into NIH-Image. A selection tool was used to mark the outline of the participant (exempting the head, feet, and hands). The number of pixels was calculated for both the frontal view of the whole person (sum of pixels front) and the back view (sum of pixels back; see Figure 1b) in the selection. This gave a general measure for the body surface of the person. We then calculated the following measures.

Amount of skin display. All areas of visible skin were marked with a selection tool. The amount of pixels in the selection was then measured for both the upper body section (skin front upper, skin back upper) and the lower body section (skin front lower, skin back lower; see Figure 1c). The division line between upper and lower body was the line visible between upper body clothing and lower body clothing. If, for example, a participant was wearing a dress, the midline of the waist was chosen as the division line. With this procedure, we calculated the following variables: (a) total skin shown = (skin front upper + skin back upper + skin front lower + skin back lower) / (sum of pixels front + sum of pixels back), and (b) "mini skirt" = (skin front lower + skin back lower) / (sum of pixels front + sum of pixels back). This measure describes skin shown as a percentage of body surface, and is thus comparable between subjects.

Sheer clothing. We used the same procedure to calculate variables for sheer clothing items, like panty hose or see-through sleeves. Sheer items where selected, measured, and put in relation to the whole body via the following formula: sheer = (sum of front sheer pixels + sum of back sheer pixels) / body surface.

Clothing tightness. Clothing tightness was rated by two independent observers for all four body views (front upper body, front lower body, back upper body, back lower body) on a 7-point Likert scale (1 = *loose*, 7 = *very tight*). The tightness score then was calculated as the sum of the ratings divided by two. This could result in a maximum score of 28. Interrater reliability was high at 94 %.

RESULTS

We present the participants' motivations for being at the discotheque and the self-descriptions of their clothing first. Second, we report the participants' motivations for being at the disco and self-descriptions of their clothing in conjunction with the digital analyses of clothing. Last, we report hormonal status (estradiol and testosterone) in conjunction with all other variables.

Motivation for Discotheque Visits

The use of hormonal contraceptives did not affect self-reported motivation when all pill takers were tested against all non-pill-takers. (Kruskal-Wallis test, *ns*). We found effects, however, for the relationship between partner status and reported motivation. Single females reported a significantly higher motivation for the categories "meet new people" and "flirt" (Kruskal-Wallis test, $\chi^2 = 28.9$, $p < .001$; $\chi^2 = 59.5$, $p < .001$).

Motivation for being at the discotheque differed significantly in and between groups (Table 2). Within the partner present-pill group, the highest motivation was for "meet new people" and the lowest motivation was for "flirt" (Friedman test, $n = 40$, $\chi^2 = 18.3$, $p < .001$). This pattern was different within the partner present-no pill group. This group showed the highest motivation for "hang around" and the lowest motivation for "flirt" (Friedman test, $n = 24$, $\chi^2 = 6.0$, $p < .001$). Among the partner absent-pill, partner absent-no pill, single-pill, and single-no pill females, the highest motivation was "meet new people" and the lowest motivation was "sex" (Friedman test, $n = 48$, $\chi^2 = 31.5$, $p < .001$; $n = 68$, $\chi^2 = 27.9$, $p < .001$; Friedman test, $n = 55$, $\chi^2 = 57.22$, $p < .001$; $n = 109$, $\chi^2 = 103.4$, $p < .001$). In general, for all groups of females the main motivation was "meet new people," with the exception of the partner present-no pill females.

For the motivation "hang around" across groups, partner present-pill females scored highest while partner absent-no pill females scored lowest (Kruskal-Wallis test, $\chi^2 = 12.9$, $p = .02$). For the motivation "meet new people," all single females scored higher than females with partners (Kruskal-Wallis test, $\chi^2 = 33.2$, $p < .001$). The same holds for the motivation "flirt" (Kruskal-Wallis test, $\chi^2 = 61.6$, $p < .001$). No significant differences for the motivation "sex" were found among groups (Kruskal-Wallis test, $\chi^2 = 8.3$, $p = .14$).

Self-Description of Dress

Hormonal contraceptives and relationship status did not affect self-description of clothing (Kruskal-Wallis test, *ns*). Across groups, no particular group described their clothing

Table 2. Motivation, Mating Status, and Hormonal Contraception

	Type																	
	PP-pill			PP-no pill			PA-pill			PA-no pill			Single-pill			Single-no pill		
Motivation	*M*	*SE*	*N*	*M*	*SE*	*N*	*M*	*SE*	*N*	*M*	*SE*	*N*	*M*	*SE*	*N*	*M*	*SE*	*N*
Hang around	3.28	.33	40	3.38	.39	24	2.44	.21	69	2.29	.25	48	2.65	.26	57	3.01	.19	113
Meet new people	3.33	.35	40	2.67	.40	24	3.17	.24	69	3.69	.30	48	4.63	.28	57	4.45	.19	113
Flirt	2.25	.32	40	2.21	.38	24	2.52	.21	69	2.77	.28	48	4.44	.28	57	4.14	.19	113
Sex	2.30	.32	40	3.17	.53	24	1.91	.24	69	2.02	.28	48	2.11	.22	57	1.94	.16	113

Note. PP = partner present; PA = partner absent.

as significantly more sexy (Kruskal-Wallis test, $\chi^2 = 4.48$, $p = .48$), bold (Kruskal-Wallis test, $\chi^2 = 4.79$, $p = .44$), modest (Kruskal-Wallis test, $\chi^2 = 1.89$, $p = .87$), or natural (Kruskal-Wallis test, $\chi^2 = 6.37$, $p = .27$; see Table 3).

Within groups, all groups most often described their clothing as significantly more natural, followed by sexy, modest, and bold. This was the case for females in the groups partner present-pill (Friedman test, $n = 40$, $\chi^2 = 15.1$, $p = .001$), partner absent-pill (Friedman test, $n = 69$, $\chi^2 = 24.7$, $p < .001$), partner absent-no pill (Friedman test, $n = 48$, $\chi^2 = 19.8$, $p < .001$), single-pill (Friedman test, $n = 57$, $\chi^2 = 7.9$, $p < .05$), and single-no pill (Friedman test, $n = 113$, $\chi^2 = 52.7$, $p < .001$). This pattern also occurred but was not significant for the partner present-no pill group (Friedman test, $n = 24$, $\chi^2 = 6.9$, $p = .07$).

Motivation and Self-Description of Dress

Using Spearman's rho analysis of reported motivation and self-description of clothing, we found a correlation between clothing description and courtship motivation (see Table 4). Females who reported a high motivation to "hang around" rated their clothing significantly more modest and significantly less sexy. Females who rated high on the motivation "meet new people" and "flirt" rated their clothing significantly more sexy and bold. Likewise, females who reported a high motivation for sex rated their clothing high on both sexy and bold, but low on natural.

Digital Analysis of Clothing: Skin Display, Clothing Sheerness, and Tightness

There were no significant group differences in the clothing digital analysis measurements (Kruskal-Wallis test, all *ns*). All groups displayed skin at an average of 23% to 30% of their body surface. When females wore skirts, they showed skin at an average of 7% to 12% of the lower body surface. Sheer clothing was rare, with an average of 1% of clothing in the study being sheer. Tightness ranged between 10 to 13 rating points (on a scale of 0-28, with 28 being the tightest). The measurements correlated with each other. Skin display positively correlated with tightness ($n = 351$, rho = .30, $p < 0.001$) and shorter skirt length ($n = 351$, rho = .83, $p < 0.001$). Sheerness also correlated with tightness (rho = .113, $p < 0.45$), but not with shorter skirt length (rho = -.06, *ns*). Overall, we found no significant differences across groups for relationship status, hormonal contraceptives, and clothing choice dimensions. Results are shown in Table 5.

Clothing Choice, Self-Description of Clothing, and Reported Motivation

We found marginal correlations between clothing choice and reported motivation, with Spearman's rho ranging between -.07 and .183. The motivation for sex positively correlated with wearing sheer clothing ($n = 351$, rho = .18, $p = .001$). However, when we made a Bonferroni correction for the number of correlations, we found that only the partner absent-no pill group showed a significant correlation between motivation for sex and wearing sheer clothing ($n = 48$, rho = .45, $p = .003$).

A Bonferroni-corrected correlation for the digital analysis of clothing and self-description of clothing also showed significant results. Increased skin display was not self-rated as modest ($n = 351$, rho = -.19, $p = .001$), but it was rated as sexy ($n = 351$, rho = .39, $p < .001$) and bold ($n = 351$, rho = .259, $p < .001$). Wearing sheer clothing was not rated as natural ($n = 351$, rho = - .24, $p < .001$), but was considered sexy and bold ($n = 351$, rho = .239, $p < .001$; $n = 318$, rho = .31, $p < .001$). A similar pattern was found for tightness, although the correlations were somewhat lower (sexy rho = .27, $p < .001$; bold rho = .19, $p = .001$). In addition, wearing a miniskirt was not considered modest ($n = 351$, rho = -.18, $p = .001$) but was considered sexy and bold ($n = 351$, rho = .33, $p < .001$; $n = 351$, rho = .25, $p < .001$).

Hormones, Self-Description of Clothing, and Motivation

To see how hormone levels relate to reported courtship motivation and the self-description of clothing, we analyzed saliva samples. The average hormone level was 12.9 pg/ml estradiol ($n = 351$, $SD = 18.3$) and 111.0 pg/ml testosterone ($n = 351$, $SD = 167.0$). Significant differences for these hormone levels were not found across groups ($n = 351$, Kruskal-Wallis test, *ns*).

Within groups, we found effects for testosterone in two groups. Single-pill females described their clothing style as sexy when they had high testosterone levels ($n = 57$, rho = .28, $p = .04$) and single-no pill females described their clothing as modest under high testosterone levels ($n = 113$, rho = .29, $p = .004$). Regarding estradiol levels, partner absent-no pill females describe their clothing style as bold when they had high estradiol levels ($n = 48$, rho = .35, $p = .02$).

Table 3. Self-Description of Dress, Mating Status, and Hormonal Contraception

	Type																	
	PP-pill			PP-no pill			PA-pill			PA-no pill			Single-pill			Single-no pill		
Dress style	*M*	*SE*	*N*	*M*	*SE*	*N*	*M*	*SE*	*N*	*M*	*SE*	*N*	*M*	*SE*	*N*	*M*	*SE*	*N*
Natural	4.50	.27	40	4.21	.39	24	4.46	.24	69	4.75	.30	48	4.16	.25	57	4.82	.18	113
Modest	3.18	.29	40	3.63	.40	24	3.25	.21	69	3.29	.26	48	3.46	.24	57	3.21	.17	113
Sexy	3.90	.28	40	3.75	.41	24	3.64	.24	69	3.54	.26	48	3.89	.26	57	3.36	.18	113
Bold	2.88	.27	40	2.83	.33	24	2.88	.25	69	3.23	.29	48	3.36	.25	57	2.80	.16	113

Note. PP = partner present; PA = partner absent.

Table 4. Correlations Between Self-Description of Dress and Motivation

	Hang around $N = 345$	Meet new people $N = 350$	Flirt $N = 350$	Sex $N = 349$
Natural	.073	.040	-.024	-.154*
Modest	.208*	-.078	-.051	-.050
Sexy	-.125*	.189*	.175*	.220*
Bold	-.101	.191*	.173*	.287*

* Spearmans rho, $p < .02$.

Regarding hormone levels and reported motivation, we found effects in three groups. In partner present-pill females, estradiol levels positively correlated with the reported motivation to flirt ($n = 40$, rho = .35, $p < .05$). In partner present-no pill females and single-pill females, testosterone levels positively correlated with the motivation for sex ($n = 24$, rho = .44, $p < .05$; $n = 57$, rho =.36, $p < .01$). Results are shown in Table 6.

Hormones and Digital Analysis of Clothing

Regarding hormone levels and actual clothing, when all groups were collapsed into one we found that testosterone correlated positively with sheerness ($n = 351$, rho = .16, $p = .007$). Analysis within groups showed further correlations (see Table 7). In partner absent-no pill females, estradiol level was found to correlate positively with skin display ($n = 48$, rho = .32, $p = .03$) and shortening skirt length ($n = 48$, rho = .31, $p = .04$), while testosterone level positively correlated with sheerness ($n = 48$, rho = .48, $p = .001$). Likewise, in single-pill females, testosterone level correlated with sheerness ($n = 57$, rho = .33, $p = .01$). However, in the single-no pill group, estradiol correlated with sheerness ($n = 113$, rho = -.20, $p = .05$).

Discussion

Results of this study show that females' greatest reported motivation for going to discos is to meet new people rather than to pursue sexual opportunities or to flirt. When it comes to flirtation and meeting new people, single females report a higher motivation than females who have a partner and are at a disco. According to evolutionary theory, it would be expected that females who are at a disco unaccompanied by their partner would also have a higher motivation for meeting new people, for flirtation, and for sex, as these females would be predicted advocates of EPCs. This, however, was not found. Self-description of clothing and objective measurement of clothing might be a more covert measure of courtship motivation in this case, provided that females' courtship motivation is connected to their choice of clothing. To that end, we explored the connections among these variables.

Digital analysis of clothing for skin display, tightness, and sheerness showed that the women described their own clothing in ways that are consistent with social clothing codes. We found positive correlations between the amount of skin displayed, the sheerness of clothing, and the tightness of clothing and the self-ratings of sexy and bold, and negative correlations between skin display and the label modest, and sheerness and the label natural. This implies that females are aware of the social signals that clothing sends, especially in the direction of sexiness. Sheerness, although rare in the study, was considered to be particularly sexy by females. Further, we found that when females wore tight or revealing clothing, they tended to repeat the signal: For example, clothing that reveals the skin via a miniskirt is also likely to be tight. This suggests that signaling is redundant.

It appears that women across the six groups dressed similarly in terms of amount of skin displayed, sheerness, and tightness. This finding doesn't fit our hypothesis. We had expected that females at a disco without the accompaniment of their partner would have expressed higher sexual motivation—and thus worn more revealing and tight clothing—than the other groups. Evidence for our hypothesis that single-no pill females would signal at a lesser frequency was also not found. In total, it appears that if physique display is a sexual signal, the majority of females in discotheque settings signaled similarly. It would be interesting to see if this pattern is found in settings other than discotheques, and to see the extent to which certain courtship settings tend to attract different physique-display patterns.

Although females in discos emphasize physique in similar ways, it appears that hormone levels can affect their choices. Testosterone and estradiol levels were related to the self-description of clothing (sexy, modest, and bold) and to the actual clothing that was worn (skin display, shortening skirt length, and sheerness) in several groups. Increasing testosterone levels (and, in one group, estradiol levels) correlated with increasing sheerness. In two groups (single-pill and partner present-no pill), testosterone correlated with the reported motivation for sex. Regarding EPC

Table 5. Clothing Analysis, Relationship Status, and Hormonal Contraception

	Type																	
	PP-pill			PP-no pill			PA-pill			PA-no pill			Single-pill			Single-no pill		
Dress analysis	*M*	*SE*	*N*	*M*	*SE*	*N*	*M*	*SE*	*N*	*M*	*SE*	*N*	*M*	*SE*	*N*	*M*	*SE*	*N*
Skin	.25	.16	40	.30	.16	24	.28	.15	69	.24	.18	48	.26	.18	57	.23	.15	113
Sheer	.01	.04	40	.02	.08	24	.02	.08	69	.03	.10	48	.02	.07	57	.01	.06	113
Tightness	11.8	4.26	40	13.33	4.59	24	11.25	4.12	69	11.64	4.13	48	11.29	4.83	57	10.64	4.12	113
Skirt length	.08	.12	40	.12	.12	24	.11	.13	69	.09	.14	48	.09	.13	57	.07	.11	113

Note. PP = partner present; PA = partner absent.

Table 6. Correlations Between Motivation and Hormone Levels (pg/ml)

Type	Hang around	Meet new people	Flirt	Sex
PP-pill				
Estradiol	-.245	.189	.347*	.112
Testoserone	-.260	.037	.024	-.301
PP-no pill				
Estradiol	.101	-.225	-.204	.280
Testosterone	-.285	-.279	-.327	.438*
PA-pill				
Estradiol	.064	-.019	.110	.052
Testosterone	.042	-.072	.087	-.037
PA-no pill				
Estradiol	.160	.118	.183	.246
Testosterone	-.133	.042	.011	.170
Single-pill				
Estradiol	-.082	.132	-.138	-.023
Testosterone	-.170	-.022	-.013	.361**
Single-no pill				
Estradiol	.026	-.186	-.100	-.105
Testosterone	.193	-.183	-.179	-.044

Note. PP = partner present; PA = partner absent.
* Spearmans rho, $p < .05$. ** Spearmans rho, $p < .01$.

research, it is interesting that only in the partner absent-no pill group did estradiol levels correlate with shortening skirt length and skin display. If clothing choice can be considered a reflection of sexual strategy, it makes sense that females should signal only when the benefit of signaling can be actualized—namely, when a female is in her most fertile phase.

Although the variety of findings across groups makes it difficult to make definitive statements about the contextual and behavioral correlates of sex hormones in the current research, findings suggest that this connection may be a particularly important area for future research on female sex-motivation systems. As Bancroft (2002) has mentioned, it is paradoxical that with the normal menstrual cycle and the widespread use of steroidal contraceptives there are many more opportunities to study sex-hormone and behavior links in women than in men, and yet, compared with what we know about men, the picture for women remains unclear and the results often contradictory. Bancroft (2002) suggests that there are a number of possible explanations for this confused picture of hormones and sexual behavioral. One plausible explanation is that women vary in the impact that reproductive hormones have on their sexual interest and responsiveness. Regarding testosterone, for example, there may be a minimal level necessary for most women, but some women are particularly sensitive to its effects. Other women are relatively unaffected by changing levels of testosterone.

This variation in female response to sex-hormone levels is especially interesting for researchers coming from an evolutionary perspective. Looking at the effects of hormone levels in combination with contextual cues is important for our understanding of women's evolved sexual motivation systems and alternative mating strategies. In connection with this, the current research indicates that since women are aware of the signal value of their clothing and because they may alter their clothing according to their reported courtship motivation, measurements of skin display, clothing sheerness, and tightness might be one indirect means of finding out more about potential signaling in actual courtship contexts. Now that we have come to the realization that women, too, are followers of alternative sexual strategies, a new area of research awaits.

Table 7. Correlations Between Clothing Analysis and Hormone Levels (pg/ml)

Type	Skin	Sheer	Tightness	Skirt length
PP-pill				
Estradiol	-.021	-.132	-.025	.025
Testosterone	.122	.201	-.085	.159
PP-no pill				
Estradiol	-.389	.371	.050	-.188
Testosterone	.171	-.062	-.061	.271
PA-pill				
Estradiol	-.140	.162	.019	-.027
Testosterone	-.143	-.037	.071	-.054
PA-no pill				
Estradiol	.324*	.186	.310*	.312*
Testosterone	-.009	.480**	.051	.017
Single-pill				
Estradiol	.013	.236	-.148	-.006
Testosterone	-.148	.331*	-.018	-.201
Single-no pill				
Estradiol	.124	-.201*	-.088	.160
Testosterone	-.034	-.011	-.187	.045

Note. PP = partner present; PA = partner absent.
* Spearmans rho, $p < .05$; ** Spearmans rho, $p \leq .001$

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