The degree of instrumentality and expressiveness displayed by males and females is known to correlate with a wide range of behaviors. A number of studies have investigated the impact of these personality traits on sexual strategy selection, in particular partner preference. Here we report associations between the lifetime number of sexual partners and the age at first sexual intercourse in relation to personality (as measured by the Bem Sex Role Inventory; BSRI) in a sample of 232 German males and females aged 16 to 63 years. Significant sex differences were found for BSRI measures such that males scored higher on instrumentality, while females scored higher on expressiveness. Significant positive associations between BSRI instrumentality scores and the reported lifetime number of sexual partners were found in both males and females. In addition, reported age of first sexual intercourse was negatively correlated with BSRI instrumentality scores in males. Finally, females scoring higher on BSRI instrumentality reported to have more lifetime number of sexual partners, even when actual biological age was controlled for. These findings suggest that there are significant within-sex differences in sexual behaviors due to the possession of instrumental personality traits.

Keywords: personality, sex partners, humans, instrumentality, expressiveness
1. INTRODUCTION

In recent years, a number of evolutionary psychologists have tried to understand the mechanisms of human mating behavior (see e.g. Buss, 2003; Buss & Schmitt, 1993; Trivers, 1972) by claiming that human sexual partner and relationship type preferences are due to evolutionary adaptations. This has led to a wide range of reported differences in males and females concerning their sexuality, for example males show higher frequencies of masturbation, and they report higher numbers of desired sexual partners (for a review see Oliver & Hyde, 1993).

In addition, Buss and Schmitt (1993) show that males place a greater emphasis on short-term relationships than women, while women relative to men, prefer sexual relationships in the context of long-term relationships. Men rate physical attractiveness more important than women do, while women place a greater importance on partner status (Buss & Barnes, 1986). Although much of this research has focused on between-sex differences, there is a considerable degree of within-sex variation. One important gender difference concerns the extent to which individuals possess instrumental-masculine or expressive-feminine personality traits. There is however, a degree of inconsistency within the field. Whilst Bem (1974) refers to the possession of masculine or feminine sex-typed personality traits, Spence, Helmreich and Stapp (1974, 1975) refer to the possession of instrumental and expressive personality traits. As the Bem Role Sex Inventory (BSRI) may not directly measure sex role or gender identity (Spence, 1984), we refer here to instrumentality and expressiveness rather than sex-role identity.

Concerning the relevant terminology, one should also be aware of the differentiation between sex and gender, where sex is defined as the biological differences between males and females; gender relates to societal expectations in accordance to each sex (Walsh, 1997). Furthermore, gender roles are defined as the prescribed behaviors, attitudes, and traits socially
defined as appropriate for one’s gender (Lips, 1988). For example, women are regarded as being affectionate and emotional whilst men are considered to be more ambitious and confident (Gough & Heilbrun, 1965; Williams & Bennett, 1975).

The expression of instrumentality and expressiveness may be associated with the possession of other well established personality traits. Francis and Wilcox (1998) explored the relationship between instrumental and expressive personality traits and three personality dimensions (extraversion, neuroticism and psychoticism) on the Eysenck Personality Questionnaire (Eysenck & Eysenck, 1975). The possession of instrumental personality traits was associated with high extraversion and low neuroticism. The possession of expressive personality traits was related to low psychoticism and high neuroticism. The relationship between personality traits and higher extraversion and lower neuroticism has been demonstrated by a variety of researchers (e.g. Nagoshi, Pitts, & Nakata, 1993).

The degree of instrumentality and expressiveness displayed by males and females is associated with a wide range of behaviors (e.g. Burn, O’Neil, & Nederend, 1996; Oliver & Toner, 1990; Scarbrough & Johnston, 2005). A number of papers have investigated the impact of personality on sexual strategy selection, in particular partner preferences (Cunningham & Russell, 2004; Mikach & Bailey, 1999; Ostovich & Sabini, 2004). Eysenck (1967) further reasoned that extraverts were less sensitive to external stimuli than introverts, and so sought greater stimulation in order to reach arousal. As a result, extraverts were expected to demand greater sexual stimulation than introverts, and seek more varied sexual behaviour. Indeed, those with higher levels of extraversion are more likely to behave in a promiscuous manner (Eysenck, 1976), are more active in a variety of sexual practices, and have a particularly hedonistic view of sex (Barnes, Malmuth, & Check, 1984). Heaven, Fitzpatrick, Craig, Kelly, and Sebar (2000) further report that in women, extraversion is
associated with increased sexual curiosity and sexual excitement, whilst neuroticism is associated with higher guilt and low levels of satisfaction.

There are two primary reasons to suggest that the expression of instrumental or expressive personality traits should be related to sexual strategy selection (see Cunningham & Russell, 2004). Firstly, it has been suggested that individuals who are not consistently sex-typed (Simpson & Gangestad, 1991) have a lower mate value than individuals who are consistently sex-typed. Therefore, women with a greater level of instrumentality may follow a short-term strategy in order to counter the disadvantages associated with a lower mate value. This implies that for all women, a long-term strategy would be optimal. Secondly, an alternative explanation suggests that men or women select a sexual strategy because of the personality traits associated with that strategy. For example, women with a high level of expressiveness would be more likely to display the characteristics ‘loves children’ and ‘shy’, which would be more advantageous in a long-term committed relationship than in a short-term unrestricted mating. In contrast, the characteristics ‘self-sufficient’ and ‘self-reliant’ would imply that women are not dependent on male investment and that they are less concerned with the pursuit of long-term relationships.

Cunningham and Russell (2004) showed that the expression of instrumental or expressive personality traits is associated with the preference for physically attractive, or committed, but not high status partners. First, they replicated the finding that males emphasize the importance of physical attraction whereas females focus on commitment and status of a potential partner (for an overview of research in this area see Buss, 2003). Male and female participants were then classified as either masculine or feminine stereotyped (masculine if they scored more highly on instrumental than expressive traits, and feminine if they scored more highly on expressive than instrumental traits). Participants, who expressed a greater degree of masculinity-instrumentality, judged physical attraction in a potential partner as
more important than participants who rated highly on expressiveness. On the other hand, participants who expressed a greater degree of femininity-expressiveness were found to lay greater importance on commitment in a potential partner than participants with an instrumental personality (no such results were found for status). Regression analysis demonstrated that biological sex predicted the greatest amount of physical attractiveness and commitment preference variance. However, allocation to these sex-typed categories, based on the possession of instrumental or expressive personality traits increased the predictive power of the model, and explained a significant amount of partner preference variance.

Another aspect of sexual strategy selection, namely the number of sexual partners, was explored by Mikach and Bailey (1999). Different measures were employed, these consisted of self-reported gender behavior during childhood, and current masculine or feminine feelings and behaviors, complemented by gender role ratings provided by interviewers (masculine or feminine physical appearance and behavior). Females with a high lifetime number of sexual partners (classified as having at least 20 sexual partners by the age of 25) rated themselves to be more masculine, and were rated as being more masculine by others, than females with low lifetime numbers of sexual partners (classified as having five or fewer sexual partners at the age of 25). In addition, women with a greater number of lifetime sexual partners experienced their first sexual intercourse at an earlier age. Mikach and Bailey found no evidence to suggest that females with a high number of sexual partners had a lower mate value, or experienced a stressful family environment during childhood.

However, Mikach and Bailey only focussed on female participants; in a similar study Ostovich and Sabini (2004) included both male and female participants and assessed both childhood gender conformity and continuous (i.e. current) gender identity. Lifetime number of sexual partners was significantly correlated with childhood gender conformity for women, but not men. For both sexes, lifetime number of sexual partners was unrelated to continuous
gender identity. Sociosexual orientation was not related to childhood gender conformity or continuous gender identity in men. However unrestricted women were more masculine, both in childhood and currently, than sexually restricted women.

There are a number of possible reasons for the association between sex-role identity and sexual behavior. Mikach and Bailey (1999) proposed three possible explanations for the relationship between instrumentality and sociosexual history. Firstly developmental masculinization of the brain may influence both sexual behavior and personality. Research has consistently documented the role of testosterone in adult sexual behaviour using a variety of techniques. The administration of androgens (often testosterone) to those with low sexual desire increases interest in sexual behavior (e.g. Wang et al., 2000). Singh, Vidourri, Zambarano and Dabbs (1999) report that ‘butch’ lesbians whose role relates to a more masculine type strategy (greater number of sex partners and increased interest in erotica) have higher levels of circulating testosterone than ‘femmes’. It is not just the number of partners or incidence of sex that is related to testosterone level. Masturbation frequency and vaginal response to erotic stimuli (Schreiner-Engel, Schiavi, Smith & White, 1981) are also correlated with testosterone levels.

There is also evidence to suggest that testosterone influences the development of an instrumental personality. Wilson (1983) investigated the relationship between digit ratio (a reliable indicator of prenatal testosterone levels – see Manning, 2002) and female personality. Women with an assertive instrumental personality displayed a male-typical ratio, indicating a high level of prenatal testosterone. Csathó, et al. (2003) also show a relationship between instrumentality and digit ratio in women. Secondly, unrestricted women begin to adopt the personality traits typically expressed by men after adopting a masculine sex-typed sexual behavior pattern. Thirdly, women’s instrumental personality leads to an unrestricted sexual strategy (Mikach & Bailey, 1999).
The findings detailed above indicate that the expression of an instrumental or expressive personality is associated with females’ lifetime numbers of sexual partners; however, the impact of these traits has not been fully revealed. Mikach and Bailey’s (1999) unrestricted female sample was rather atypical, containing women who reported having at least 20 sexual partners by the age of 25. With regard to lifetime number of sexual partners and sociosexual orientation, Ostovich and Sabini (2004) reported significant associations for females, but no significant associations for males. Thus, it is currently unclear whether males’ personality influences sexual behavior.

The present study attempts to replicate prior findings on female instrumentality and number of lifetime sexual partners and to examine these relationships in males. Four general hypotheses are tested: first, females with higher lifetime numbers of sexual partners will possess a higher level of instrumentality than females with lower lifetime numbers of sexual partners. Second, females with a high level of instrumentality will have had sexual intercourse at an earlier age than females with a low level of this trait. With regard to males, the following hypotheses are tested: first, males with higher lifetime numbers of sexual partners will possess a more instrumental personality than males with lower lifetime numbers of sexual partners. Second, instrumentality will be related to age at first sexual intercourse for males.

2. METHOD

2.1 Participants

Our sample was made up of 232 participants aged 16 to 63 years, and comprising 84 males (mean age = 31.23, SD = 12.44) and 148 females (mean age = 30.83, SD = 11.77), recruited at the University of Goettingen (Germany), and from a community sample in Vienna (Austria). These individuals reported to be exclusively heterosexual.
2.2 Materials

All participants completed the German version of the Bem Sex-Role Inventory (Schneider-Düker & Kohler, 1988). The original Bem Sex-Role Inventory (BSRI; Bem, 1974; 1981) was developed in order to measure (psychological) masculinity and femininity respectively (Bem, 1981; Lippa, 1991) and comprised 60 items (i.e., 20 masculine, 20 feminine, and 20 non-gender related items). Respondents indicate how well each characteristic fits their self-perception on a 7-point Likert scale (ranging from “never” and “almost never true” to “always” or “almost always true”). As explained in the introduction, the extent to which these scales measure masculinity or femininity remains uncertain. Therefore, the terms instrumentality and expressiveness, rather than masculinity and femininity will be utilized throughout.

The German version of the BSRI is not a mere translation of the original inventory by Bem and has two important advantages. First, Schneider-Düker and Kohler redesigned the inventory following Bem’s procedure and thereby were able to consider cultural differences between the original sample and the German sample (Schneider-Düker & Kohler, 1988). Second, it does not include the items feminine and masculine of the original inventory, which have been considered problematic (for details see Pedhazur & Tetenbaum, 1979). Schneider-Düker and Kohler (1988) report a Cronbach’s alpha for the instrumentality subscale of $\alpha = .85$ and for expressiveness subscale $\alpha = .74$ for the German version of the BSRI. These measures are comparable to Bem’s internal consistency of the original sample ($\alpha = .86 – .80$) (Bem, 1974).

Only the expressiveness and instrumentality scales were utilized in this study in order to make results comparable, rather than the four-fold categorization (masculine, feminine, androgynous and undifferentiated) which has been criticized (Archer & Lloyd, 2002). The scores for instrumentality and expressiveness are calculated as follows: the expressiveness
score equals the mean self-rating for the 20 expressive items leading to a score between 1 and 7, the same is true for the instrumentality score (Bem, 1974).

In addition, participants were asked to answer a number of demographical questions (sex, age, nationality) and complete a sexual history questionnaire. The sexual history questionnaire required participants to indicate their sexual orientation, lifetime number of sexual partners and age at first sexual intercourse.

3. RESULTS

Not all measurements were normally distributed (i.e. age and the variables that related to sexual history were not), leading to the use of nonparametric statistical tests in analyzes, if not otherwise indicated. Probabilities are reported as two-tailed and a probability of 5% ($p = .05$) or less is considered statistically significant.

3.1 Sex differences

Table 1 reports mean scores and standard deviations of BSRI scores and the values obtained by the sexual history questionnaire for the total sample and for males and females. Significant sex differences were only found for BSRI scores, which were tested with a simple t-test (instrumentality score: $t = 2.78, p < .01$; Cohen’s $d = 0.38$; expressiveness score: $t = -4.99, p < .001$, Cohen’s $d = -0.67$). No significant age difference was found, nor any differences in the sexual history questions between males and females (Mann-Whitney $U$ test, all $p > .05$).

3.2 Correlations

Spearman rank correlations ($\rho$) revealed significant positive associations of BSRI instrumentality scores with the reported lifetime number of sexual partners. This was found in the total sample, and also when considering males and females separately (see Table 2). Reported age at first sexual intercourse was negatively correlated with BSRI instrumentality
scores and found significant in the total sample and in males. No significant associations were found between sexual history variables and BSRI expressiveness scores.

Moreover, no significant correlations were detected between age and the reported age at first sexual intercourse, and between age and personality measures. However, the correlations between the possession of instrumental or expressive personality traits and sexual history are likely to be affected by age, which was found to be significantly positively correlated with the number of sexual partners in the total sample and also for males and females separately (Table 2).

We therefore tested whether personality was related to lifetime number of sexual partners and also age at first sexual intercourse when the effect of age was controlled for (see Table 3). A square root transformation was applied to the sexual history variables to overcome potential statistical bias from large values, particularly for the report of the number of sexual partners, which was positively skewed. When divided by sex, significant correlations with lifetime number of sexual partners were found for the total sample and for females regarding BSRI instrumentality; a positive correlation in males was still present but was no longer significant. The correlation for expressiveness revealed no significant outcomes, either in males or females. Age at first sexual intercourse was found to be significantly negatively correlated with BSRI instrumentality scores for the total sample but just failed to reach significance in males (p = .053). However, the correlation coefficient was almost the same as without controlling for age (rho = -.228) and in view of our predictions one could possibly argue for the application of one-tailed testing, which would lead to a significant association between age at first sexual intercourse and BSRI instrumentality in males (p = .027). This would indicate that males reporting the possession of an instrumental personality had their first sexual intercourse at an earlier age.
The additional control of country as a potential confounding factor did not indicate substantial changes to any reported correlation. Fisher’s $r$ to $z$ transformation of correlation coefficients revealed no significant between-sex differences of the strength of correlations for any variable.

4. DISCUSSION

The findings of the present study are that instrumental women reported a greater number of lifetime sexual partners than expressive women, and that instrumental men reported a younger age of first sexual intercourse than expressive men.

The findings suggest that there are significant within-sex differences in sexual behavior. In particular, the results suggest that men and women’s instrumentality influences age of first intercourse and number of lifetime sexual partners. The findings are consistent with previous research which indicates a relationship between instrumentality-masculinity and sexual behavior. Mikach and Bailey (1999) showed that women with a high number of lifetime sexual partners both rate themselves as more masculine, and are rated by others as more masculine, than women with a low number of lifetime sexual partners. Women’s lifetime number of sexual partners is also related to childhood gender conformity (Ostovich & Sabini, 2004), although in this study the relationship between partner number and continuous gender identity was not significant.

The current study does not investigate partner preference but focuses on partner number and the age at which a person becomes sexually active. However, the indication that assertive, instrumental women may actualise a greater number of opportunities for sexual activities (suggestive of a short-term sexual strategy) is consistent with previous research showing that instrumental women prefer the traits traditionally favored by men, and expressive women prefer the traits traditionally favored by women (Cunningham & Russell,
We suggest that instrumental women are more confident and self-reliant, an approach which reduces their dependence on the investment of a male partner. This independence may encourage women to seek short-term rather than long-term relationships, resulting in a greater number of lifetime sexual partners.

The present study focused on the expression of instrumental or expressive personality traits and their relationship to sexual behavior. We did not however investigate the development of these traits or the degree to which childhood instrumentality or expressiveness is consistent with adult personality. A greater understanding of the degree to which these traits are stable would help establish the extent to which - and the manner in which - they influence subsequent behavior.

The research benefits from the inclusion of both male and female participants. Previous research, for example Mikach and Bailey (1999) has often focused on instrumentality in a female sample only. However, it is important to consider whether these personality traits exert a similar influence on the behavior of males and females, or whether it influences different aspects of mating behavior.

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REFERENCES


Table 1. Means and standard deviation (SD) of BSRI scores and questions regarding sexual history

<table>
<thead>
<tr>
<th></th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total sample (N = 232)</td>
</tr>
<tr>
<td>Instrumentality score</td>
<td>4.63 (.67)</td>
</tr>
<tr>
<td>Expressiveness score</td>
<td>4.81 (.60)</td>
</tr>
<tr>
<td>Age</td>
<td>30.98 (12.01)</td>
</tr>
<tr>
<td>Lifetime number of sexual partners</td>
<td>10.35 (18.84)</td>
</tr>
<tr>
<td>Age at first sexual intercourse</td>
<td>16.81 (2.19)</td>
</tr>
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</table>
Table 2. Spearman rank correlations (rho) of questions regarding sexual history with BSRI scores and age.

<table>
<thead>
<tr>
<th></th>
<th>Total sample (N=232)</th>
<th>Males (N=84)</th>
<th>Females (N=148)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age at first sexual intercourse</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BSRI instrumentality</td>
<td>-.149*</td>
<td>-.228*</td>
<td>-.122</td>
</tr>
<tr>
<td>BSRI expressiveness</td>
<td>.088</td>
<td>.161</td>
<td>.043</td>
</tr>
<tr>
<td>Age</td>
<td>.113</td>
<td>.112</td>
<td>.119</td>
</tr>
<tr>
<td><strong>Lifetime number of sexual partners</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BSRI instrumentality</td>
<td>.282**</td>
<td>.384**</td>
<td>.209*</td>
</tr>
<tr>
<td>BSRI expressiveness</td>
<td>-.061</td>
<td>-.030</td>
<td>-.044</td>
</tr>
<tr>
<td>Age</td>
<td>.494**</td>
<td>.578**</td>
<td>.448**</td>
</tr>
</tbody>
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Note: * p < .05, ** p < .01
Table 3. Partial correlations ($r_{pc}$) of questions regarding sexual history with BSRI scores controlling for age.

<table>
<thead>
<tr>
<th></th>
<th>Total sample (N=232)</th>
<th>Males (N=84)</th>
<th>Females (N=148)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age at first sexual intercourse</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>BSRI instrumentality</td>
<td>-.162*</td>
<td>-.222</td>
<td>-.108</td>
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<tr>
<td>BSRI expressiveness</td>
<td>.067</td>
<td>.018</td>
<td>.083</td>
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<tr>
<td><strong>Lifetime number of sexual partners</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>BSRI instrumentality</td>
<td>.277**</td>
<td>.127</td>
<td>.333**</td>
</tr>
<tr>
<td>BSRI expressiveness</td>
<td>-.133</td>
<td>-.064</td>
<td>-.161</td>
</tr>
</tbody>
</table>

Note: * $p < .05$, ** $p < .01$; Sexual history variables were square root transformed.