

An Empirical Investigation of Storms' Theory of Erotic Orientation Development

by

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For the Department

## Abstract

Storms' theory that erotic orientation results from an interaction between eroticization process onset and social development during early adolescence was tested. The constructs of eroticization process onset and homoeroticism were developed and tested in the present study. A variety of measures of eroticization process onset and homoeroticism were collected. A hypothesized model of erotic development was proposed in which the variables measuring eroticization process onset loaded on one factor, the variables measuring homoeroticism loaded on a second factor, and the factors were negatively related. This hypothesized model was found to account for the actual data better than two null models, when tested in a LISREL analysis. Sex differences in erotic orientation development were also discussed.

Despite a flurry of recent research into the development of homosexuality, investigators have been unable to obtain solid, reliable support for any currently existing theory (see, for examples, reviews by Bell, Weinberg, & Hammersmith, 1981; Marmor, 1980; Masters & Johnson, 1979; and Money, 1970). Storms (1978, 1979, 1981) has suggested that the failure to establish an adequate theory of homosexual etiology may stem from the failure to identify the essential psychological mechanisms underlying sexual orientation. Past theorists and researchers have tended to define homosexuality in terms of the incidence of overt sexual behavior and/or self-identification of homosexuality. Both of these approaches to defining homosexuality are confounded by a myriad of extraneous variables such as the availability of sexual partners, the social context of sexual behavior, and the social and political determinants of sexual identity. Neither a behavioral nor a sexual identity definition of homosexuality specifies the essential underlying psychological mechanisms of sexual orientation.

In contrast to past theories, Storms has suggested that researchers should focus on the determinants of erotic orientation -- that is, the causes of an individual's erotic fantasies and the erotic stimuli that are sexually arousing to the individual. Across all studies of sexual orientation, the one (and perhaps only) consistent finding has been that homosexuals and heterosexuals differ in the contents of their erotic fantasies and the nature of the sexual stimuli that are arousing to them (Storms, 1978; 1979). Storms has further suggested that erotic orientation is an important underlying factor in motivating actual sexual

behaviors and in determining sexual identity.

Given the argument that erotic orientation is the central psychological variable underlying sexual orientation, Storms has formulated a theory of erotic orientation development. More specifically, he has proposed that adult erotic orientation is partly determined by the timing of the onset of the eroticization processes and social bonding patterns during late childhood and early adolescence, and that one determinant of adult homoerotic orientation is the precocious onset of erotic development during late childhood (ages 8-13).

Storms' erotic development model is actually a synthesis of notions derived from both classical and social learning theories which cite early adolescence as a critical period in erotic development. Classical learning theories, for example, posit that eroticization is triggered by biological and behavioral events which occur at about puberty including an increase in sex hormones, increased sex drive, the beginning of masturbation behavior, and the child's first experience with orgasm. More specifically, it has been suggested that eroticization occurs when masturbation fantasies are positively reinforced by orgasm (Kinsey, Pomeroy, & Martin, 1948; Marquis, 1977; Miller & Dollard, 1950).

In addition to the processes described by classical learning theorists, social learning theorists also note the importance of self-identification in the eroticization process. Adolescence brings with it not only internal hormonal changes, but also external changes in how society treats that individual. Young people change social status from children to young adults, from non-sexual to sexual beings. During this

period, social factors influence what types of stimuli are available during periods of sexual arousal. Specifically, Gagnon and Simon (1973) suggest that masturbation and sexual fantasizing may provide the opportunity for individuals to experiment with and choose from the sexual cues society makes available.

For men, masturbation, orgasm, and the eroticization process seem to occur in close temporal contiguity with the biological changes at puberty. This seems to be less true for women. Although women enter physiological puberty at an earlier average age than men, women do not engage in expressions of sexual arousal as early as men. For example, most men engage in masturbation and experience orgasm one to two years after the onset of biological puberty; a large number of women do not begin to masturbate or experience their first orgasm until a number of years following puberty. Other indicators of sex drive development such as self-reports of sexual arousal, actual sexual experiences, and sexual fantasizing have been found to follow a similar pattern of sex differences.

Although the classical and social learning processes described above provide the basic mechanics of Storms' model, they do not specify why the eroticization process results in homoerotic orientations for some individuals. Storms suggests that homoerotic orientations may occur if and when an individual experiences the onset of eroticization processes when his or her experiences and social environment provide an unusually rich source of same-sex stimuli. Specifically, researchers have noted the pervasive availability of same-sex cues between the ages

of 8 and 13, a period of strong homosocial bonding. During this period a child's social contacts (e.g. friendship groups) are primarily homosocial, giving the child greater opportunity for homosexual experiences. Homosocial bonding leads to strong homoemotional ties, which may be experienced as sexual feelings, leading to the development of homosexual attractions.

By combining research on eroticization processes and research on social bonding patterns, Storms derived the major hypothesis of his model. Namely, he has proposed that the precocious onset of eroticization processes during the period of homosocial bonding will result in eroticization of homosexual stimuli and the development of a homoerotic orientation.

Although Storms' hypothesis has yet to be tested directly, a number of past studies provide some supportive evidence, showing prehomosexual boys to be sexually precocious compared to their peers (Bieber, Dain, Dince, Drellich, Grand, Gundlich, Kremer, Rifkin, Wilbur, & Bieber, 1962; Manosevitz, 1970, 1972; Saghir & Robins, 1974), engaging in earlier masturbation behavior (Finch, 1969; Hatterer, 1970; Kinsey, et al., 1948), and reaching first orgasm earlier (Stephan, 1973) than preheterosexual boys. Kinsey et al. (1948) noted a relationship between the early onset of adolescent sex drive and later homosexual experiences among men. Kinsey and his colleagues found a striking difference between the amount of homosexual activity among males who entered adolescence early and those who entered adolescence at a later age, with boys entering puberty younger showing a higher percentage of homosexual ac-

tivities later in their lives. Manosevitz (1970) investigated non-clinical homosexual and heterosexual male populations regarding their early sexual behavior. He found that during the preadolescent period (ages 5-12), homosexual men reported having significantly more sexual activity than their heterosexual counterparts, particularly homosexual experiences. In a later study, Manosevitz (1972) found further support for the early eroticization process in men. His findings indicate that as boys homosexuals tended to exhibit earlier feelings of sexual arousal, masturbation behavior, and masturbation fantasies than their heterosexual counterparts. Saghir and Robins (1973) reported similar results. Homosexual men in their study reported earlier sexual fantasizing, sexual arousal and stimulation, and masturbation than their heterosexual counterparts.

Two studies have shown a similar relationship for women (Goode & Haber, 1977; Saghir & Robins, 1973). Saghir and Robins (1973) reported earlier emotional attachments, physical contact, and sexual feelings, fantasies, stimulation, and arousal during preadolescence among their lesbian sample compared to their heterosexual sample. Likewise, Goode and Haber studied 160 college women and found that homosexually oriented women in their sample had been more sexually active at an earlier age than heterosexual women.

Although such research tends to support Storms hypothesis, there are three major reasons past research is not necessarily conclusive: 1) past studies have not asked the most theoretically relevant questions to assess eroticization process onset; 2) past studies have tended to look

at subjects' reports of their actual sexual behaviors, not direct measures of erotic orientation; 3) prior investigators have tended to focus on groups of self-identified homosexuals in an attempt to examine the underlying causal determinants of homosexuality.

The first major problem with using past research to test Storms' hypothesis is past researchers' failure to investigate behaviors correlated with eroticization process onset, such as experiencing feelings of sexual arousal, engaging in masturbation, awareness of sex drive and sexual arousal, and (at least for boys) physiological changes occurring at puberty. While some researchers have measured one or two such behaviors, no one has combined a variety of measures to obtain a comprehensive index of eroticization onset.

The second major problem with past research is that investigators have made little attempt to separate actual sexual behaviors from underlying erotic orientation. Erotic orientation is a psychological construct which is presumed to underlie overt expressions of sexual behavior. Measurement of overt sexual practices can be misleading, however. Actual sexual behavior reflects a number of social and psychological variables other than underlying erotic orientation, including family pressures, religious teachings, the desire to conform, and the availability of different kinds of sexual partners and opportunities.

The third problem is past investigators' tendency to study groups of self-identified, exclusive homosexuals. This sampling method is problematic for two reasons. First, the selection of self-identified homosexuals may result in looking only at the extremes of erotic orien-



tation, which may distort or obscure the influence of relevant causal variables. Second, there may be a number of irrelevant confounding factors that lead a person to establish a public or semi-public gay identity. These factors might include aspects of childhood development, personality development, sexual and social experiences, and even political attitudes that are not theoretically related to erotic orientation per se.

The present study is designed to test the hypothesis that early eroticization process onset is related to adult homoerotic orientation. The study was designed to improve on past research in three major ways. First, the present study assessed eroticization process onset with a set of theoretically derived questions about subjects' experiences of feelings of sexual arousal, engagement in masturbation, awareness of sex drive and sexual arousal, and (for men) physiological indicators of puberty onset. Second, rather than classifying subjects according to their actual sexual behavior or sexual orientation identity, the present study examined subjects erotic orientation via measures of homoerotic fantasies and level of underlying homoerotic attraction. Third, rather than recruiting a group of exclusive, self-identified homosexual subjects, the present investigation is based on a more nearly random sample of college students.

## Method

### Subjects and Procedure

One hundred fifty-nine subjects (97 males and 62 females) were recruited from an undergraduate human sexuality class at a midwestern university to answer a battery of questionnaires concerning their past and present sexual behaviors, attitudes, and fantasies. Questionnaires were distributed in class, filled out privately at home, and returned at a later class session. Participation was strongly encouraged but was voluntary and anonymous. Eighty-eight percent of the class participated. Debriefing was accomplished by a lecture presented later in the semester.

Attached to the front of each questionnaire battery was a cover sheet asking for basic biographical information such as subjects gender and age. Embedded within the questionnaires were eight items (seven for women) designed to test the present hypotheses -- four items (three for women) designed to assess the timing of eroticization onset and four items designed to assess adult erotic orientation. The questionnaire also contained items which assessed sexual orientation on the basis of actual sexual behavior. Finally, the questionnaires contained a number of items concerning sexual practices, attitudes, and feelings that were not directly relevant to the present study (See Appendix A).

Analysis of sexual behavior items revealed that 64.3% of the male subjects and 50% of the female subjects reported having engaged exclusively or predominately in heterosexual behavior, while 8.4% of the male

subjects and 1.7% of the female subjects reported having engaged exclusively or predominately in homosexual behavior. The remaining subjects (27.3 % of the males and 48.3% of the females) reported no sexual activities with either sex, or a mixture of sexual activity with both sexes. These data are consistent with past estimates of the incidence of homosexual and heterosexual behavior among college age males and females (Gagnon & Simon, 1973; Hunt, 1974; Kinsey, et al. 1948), indicating that the present sample is representative of the range of sexual experiences among college students.

### Measures

Subjects' retrospective reports of eroticization onset were assessed by asking both male and female subjects to report on three events that both classical and social learning theorists have associated with erotic development. First, subjects were asked to report the earliest age at which they began to masturbate. Specifically, subjects were asked "Throughout your life, at what ages can you remember having masturbated?" The response scale for this item ranged from age six to age 20 with a response also allowed for "never." Second, subjects were asked to report the earliest age at which they were first aware of experiencing sexual feelings and arousal: "Throughout your life, at what ages can you remember having experienced the feeling of being 'sexually aroused'?" The response scale for this item was identical to that of the previous item. Third, subjects were asked to report timing of awareness of sex drive and sexual arousal: "Try to remember back to when you were

just entering puberty. Do you think you became aware of your own sex drive and sexual arousal earlier or later than most people of your sex?" Responses for this item were rated on a seven point Likert-like scale with responses ranging from "very much earlier" to "very much later." Finally, given the evidence that eroticization onset is closely linked to biological puberty onset for males, but not for females, male subjects were also asked "In terms of physical growth, did you enter puberty younger or older than most of your friends and classmates?" Response options for this question were also on a seven point scale ranging from "very much younger" to "very much older." It was hypothesized that these four measures (three for female subjects) would be highly correlated and would all load on a single factor of eroticization onset.

Degree of adult homoerotic orientation was measured by four items asking subjects to report on frequency of homoerotic fantasies: "How frequently do you fantasize or daydream about having a sexual experience with someone of your own sex?"; frequency of homoerotic masturbation fantasies: "How often do you have a fantasy about someone of your own sex when you masturbate?"; intensity of homoerotic fantasies: "On the average, how intense are your daydreams or fantasies about having a sexual experience with someone of your own sex? How sexually arousing are they?"; and underlying homosexual attraction: "Regardless of what sexual experiences you've actually had, how much basic, underlying sexual attraction do you feel toward members of your own sex?" Both the items concerning frequency of homoerotic fantasies and homoerotic masturbation fantasies were rated on a six point scale ranging from "never-I have

never done this" to "more than once a day." The response scale to the question concerning intensity of homoerotic fantasies ranged on a six point scale from "not applicable-I never have such fantasies" to "I frequently get very sexually aroused by such fantasies." Subjects were asked to rate their underlying homoerotic attraction on an 11 point scale with endpoints indicating "absolutely no sexual attraction toward members of the same sex" to "an extremely high amount of sexual attraction toward members of your own sex." It was hypothesized that these measures would be highly intercorrelated and would load on a single factor of homoerotic orientation.

## Results

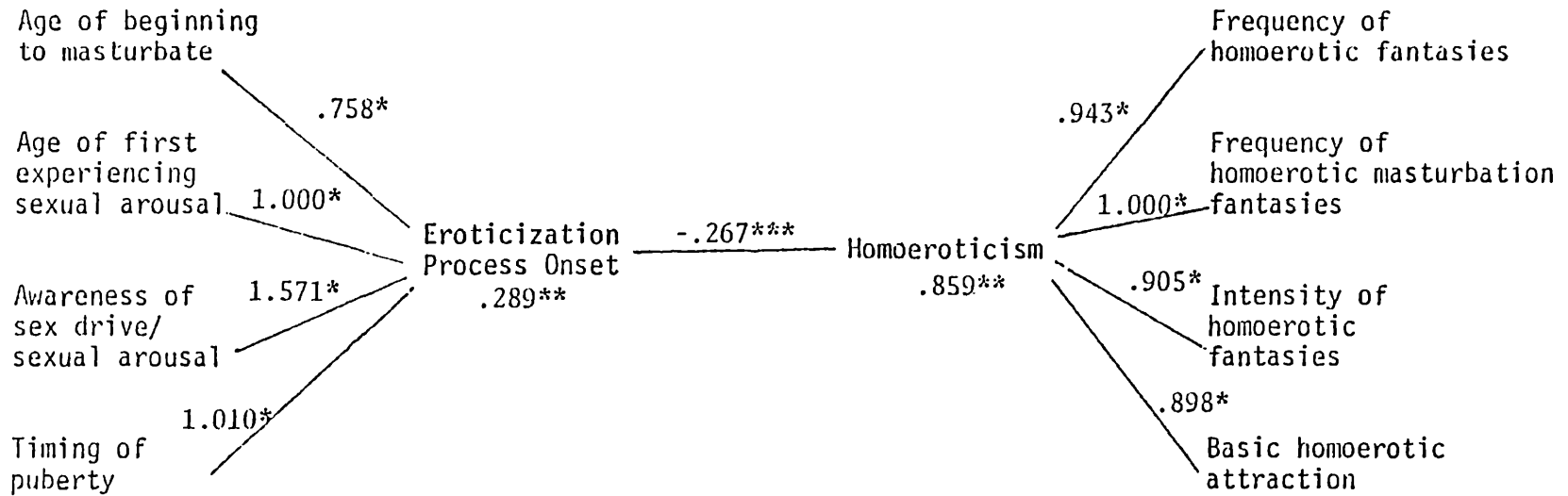
The theorized model of homoerotic orientation development was tested using a covariance structure analysis technique (Bentler & Huba, 1978). This technique allows an investigator to propose a complex model of the relationships between measures and hypothesized latent factors and the relationships among latent factors, and to test the extent to which that model can adequately account for actual relationships obtained in the data.

Specifically, two theoretical models were tested in the present study, one for each gender. For males, it was hypothesized that: a) four measures of the timing of various physiological and sexual experiences during puberty would load on a single latent factor representing eroticization process onset (i.e. relative timing of awareness of sex drive onset and sexual arousal compared to peers, relative timing of physical changes associated with entering puberty compared to peers, age of first experiencing feelings of "sexual arousal," and age of beginning to engage in masturbation behavior); b) four measures of current homoerotic fantasies and homosexual attraction would load on a single latent factor representing homoerotic orientation (i.e. frequency of homoerotic fantasies, frequency of homoerotic fantasies while masturbating, intensity of homoerotic fantasies, and degree of basic underlying attraction to members of own sex); and c) the two latent factors of eroticization process onset and homoerotic orientation would be correlated.

For women, a slightly different theoretical model was hypothesized. As discussed previously, the relationship between physiological puberty onset and eroticization onset is less direct for women than for men. For that reason, the question related to relative timing of entering puberty was not included on the eroticization onset factor in the proposed model for women. Otherwise the hypothesized model for women is identical to that for men, as shown in Figures 1 and 2.

The above models were tested using the statistical program LISREL (Bentler & Bonnett, 1980)..<sup>1</sup> Three statistical tests were performed to assess the adequacy of the hypothesized models to account for the actual data. First, the hypothesized models were compared directly to the data to determine whether the models could have generated the data. The first step in this test is to create an ideal, hypothesized set of factors and factor loadings generated by the model. In the present study, it was hypothesized that the four measures of eroticization process onset (three for women) would load entirely on the eroticization process onset factor (hypothesized factor loadings of 1.0) and would not load at all on the homoerotic orientation factor (hypothesized factor loadings of 0.0). Conversely, it was hypothesized that the four measures of homoerotic orientation would load perfectly on the homoerotic orientation factor and not at all on the sex drive onset factor. Finally it was hypothesized that the two factors would be significantly correlated. Next, LISREL takes the parameters

Figure 1  
Hypothesized Model for Males



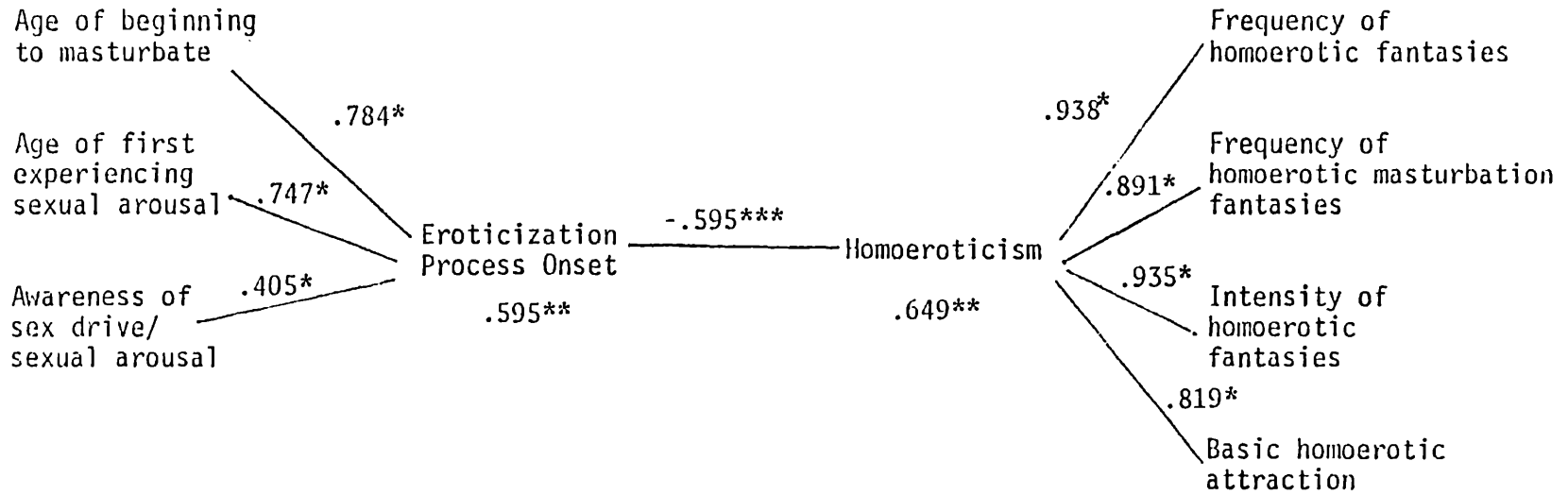
\* These numbers represent factor loadings.

\*\* These numbers are estimates of the reliability of the factor.

\*\*\* This number represents the path coefficient (beta weight) between the two factors.



Figure 2  
Hypothesized Model for Females



\* These numbers represent factor loadings.

\*\* These numbers are estimates of the reliability of the factor.

\*\*\* This number represents the path coefficient (beta weight) between the two factors.

specified above and attempts to generate, through several iterations, a pattern of covariances and standard deviations that match the covariances and standard deviations of the actual data (See Appendix B for the standard deviations and covariance matrices of the original data). Finally, a  $X^2$  statistic is calculated between the model-generated data and the actual data. A non-significant  $X^2$  indicates that the model is able to generate a pattern of data that is not significantly different from the actual data; i.e., that the model could adequately account for the data. The results of this analysis indicated that the hypothesized model did adequately represent the data for both sexes ( $X^2$  (19)  $p = .4181$  for males;  $X^2$  (13),  $p = .2507$  for females).

When dealing with large sets of data, the above test is usually considered sufficient to demonstrate the adequacy of a model. With smaller samples, however, it becomes artifactually easy to obtain a non-significant  $X^2$  and more stringent tests are applied -- tests in which competing null models are generated and are compared against the theoretical hypothesized model for their relative ability to account for the actual data. This is accomplished by deriving factor loadings and factor correlations from the null model, and comparing that to the actual data (i.e. the same iterative process as used for the theoretical model). A  $X^2$  difference test is then performed between the  $X^2$  generated by comparing the null model to the data and the  $X^2$  generated by comparing the theoretical model to the data. A significant  $X^2$  difference indicates that the theoretical model accounts for the actual data better than the null model.

Two such null hypothesis models were generated and tested against the theoretical model in the present study. In the first of these null models, the "complete null", it was assumed that no relationship exists among variables and factors. It was hypothesized that the four measures of eroticization process onset (three measures for women) are unrelated to the eroticization process onset factor (hypothesized factor loadings of .00). Similarly it was hypothesized that the four measures of homoerotic orientation are unrelated to the homoerotic orientation factor (hypothesized factor loadings of .00). Finally, it was hypothesized that the two factors would not be correlated (hypothesized correlation of .00). As in the previous test, LISREL takes these specified parameters and attempts to generate a pattern of covariances and standard deviations that match those of the original data.

The complete null model and the hypothesized model for men and women were compared. The difference between the covariances and standard deviations generated by the complete null model and the actual data was tested first and found to be highly significant ( $X^2$  (28),  $p < .00001$  for males;  $X^2$  (7) = 261.65,  $p < .00001$  for females). A  $X^2$  difference test was then performed between the  $X^2$  generated by comparing the hypothesized model to the data and the  $X^2$  generated by comparing the complete null model to the data. Results of this comparison indicated that the two models are significantly different from each other ( $X^2$  (9) difference = 425.85,  $p .00001$  for males;  $X^2$  (8) difference = 271.65,  $p < .00001$  for females). These results indicate that the theoretical model represents the data significantly better than the complete null model.

In the second and more stringent null model, the structural null model, was tested. This null model presumes that the theoretical model is correct in that all measures would load on the theoretically hypothesized factors but that, contrary to the theoretical model, the two factors are unrelated. Specifically, in his null model it was assumed that the four measures of eroticization process onset (three measures for women) would load entirely on the eroticization process onset factor (hypothesized factor loadings of 1.0) and would not load at all on the homoerotic orientation factor (hypothesized factor loadings of 0.0). Conversely, it was hypothesized that the four measures of homoerotic orientation would load perfectly on the homoerotic orientation factor and not at all on the eroticization process onset factor. Finally, it was hypothesized that the two factors would not be correlated (hypothesized correlation of 0.0).

For men, the initial comparison between the structural null model and the actual data produced a non-significant  $\chi^2$  ( $\chi^2 (20) = 24.52, p = .2205$ ), indicating that the null model alone could represent the data. However, the results of the more stringent comparison between the null structural model and the hypothesized theoretical model indicated that the hypothesized theoretical model fits the data significantly better than the structural null model ( $\chi^2 (1) \text{ difference} = 4.91, p < .05$ ). The results for women showed that the structural null model was significantly different from the actual data ( $\chi^2 (14) = p < .00001$ ). A comparison of the structural null model and the hypothesized theoretical model for women indicated that the two models are significantly dif-

ferent ( $\chi^2 (1) = 15.25, p < .00001$ ). These results indicated that including a relationship between sex drive onset and homoeroticism makes the hypothesized theoretical model a stronger fit with the actual data.

Bentler and Bonnet (1980) have also indentified a delta statistic which indicates how much of the available information a model accounts for. This statistic ranges in value from 0.0 to 1.0, with a value of 1.0 indicating that the hypothesized model accounts for all of the available information. For males, the hypothesized theoretical model  $D = .96$ ; for females, the hypothesized theoretical model  $D = .90$ .

In summary, two causal models (one for each gender) of the relationship between eroticization process onset and adult homoeroticism levels were tested using embedded path analysis. For each model, a series of statistical tests indicated that the hypothesized model: a) adequately accounts for the data; b) accounts for the data significantly better than a complete null model which assumes no relationships in the data; and c) accounts for the data significantly better than a structural null model which assumes the hypothesized factor loadings to be true but which assumes no relationship between the factors (See Table 1 for a summary presentation of the statistical results of these comparisons). Finally, the delta statistic indicated that the hypothesized models account for nearly all of the available information in the actual data. Taken together, these analyses suggest that behavioral variables of physical growth, awareness of sex drive and sexual arousal, age of experiencing the feeling of being "sexually aroused," age of having begun to masturbate, and relative age of entering puberty (for men but

not for women) are measures of the latent factor, eroticization process onset. The behavioral variables measuring frequency of homoerotic fantasies, frequency of homoerotic masturbation fantasies, intensity of homoerotic fantasies, and basic, underlying homosexual attraction are measures of the factor homoerotic orientation. The sex drive onset and erotic orientation are related as hypothesized in Storm's model.

Table 1

Summary of  $X^2$  Tests of Theoretical Model Versus Data and Versus Null

<u>Test</u>	<u>Models</u>		<u><math>X^2</math></u>	<u>p</u>
	<u>Gender</u>			
A. Theoretical Model vs. Data	Male		19.61	.4181**
	Female		15.97	.2507**
B. Theoretical Model v. Complete Null				
1. Null vs. data	Male		445.46	.00001**
	Female		287.62	.00001**
2. Theory v. Null ( $X^2$ Difference)	Male		425.85	.00001**
	Female		271.65	.00001**
C. Theoretical Model vs. Structural Null				
1. Null vs. Data	Male		24.52	.2205**
	Female		31.21	.0052**
2. Theory vs. Null ( $X^2$ Difference)	Male		4.91	.0500**
	Female		15.24	.0010**

\* In these tests, a nonsignificant p value supports the theoretical model.

\*\* In these tests, a significant p value supports the theoretical model over the null models.

## Discussion

The present study tested hypothesis derived from Storms' (1981) theory of erotic orientation development. The theory suggests that erotic orientation is partially determined by timing of eroticization process onset during puberty. From this theory the specific hypothesis that early onset of eroticization is positively related to adult homoerotic orientation was derived and tested. A variety of retrospective measures of eroticization process onset and of adult homoeroticism were collected. As predicted, the variables measuring eroticization process onset loaded on one factor, the variables measuring homoeroticism loaded on a second factor, and a negative relationship obtained between the factors. The hypothesized model was found to account for the variance better than two null models, when tested in a LISREL analysis.

Each of three key elements of the present study -- the eroticization onset factor, the adult homoeroticism factor, and the relationship between those factors -- will be discussed separately below. In addition, the current research will be compared to a recent, widely publicized study of sexual orientation carried out by Bell, Weinberg, and Hammersmith (1981).

### Eroticization Process Onset

Eroticization process onset is a hypothetical construct introduced by Storms (1981) and further developed in this study. The construct



refers to the acquisition of erotic stimuli and fantasies normally occurring around the time of puberty. Eroticization process onset is closely related to the onset of specific sexual behaviors at puberty including: masturbation, erotic fantasizing, awareness of feelings of sexual arousal, and first orgasm.

Although past researchers have measured some of the sexual behaviors listed above (e.g. Kinsey, et al. 1948), the present study is the first to measure a set of theoretically derived indices of eroticization onset and to test their internal validity via factor analysis. In the present study the hypothetical construct of eroticization process onset was measured by retrospective questions concerning: 1) age of beginning to masturbate, 2) age of first experiencing feelings of sexual arousal, 3) timing of feelings of sexual arousal relative to peers, and 4) (for men) timing of entering puberty relative to peers. As predicted, all four questions loaded significantly and exclusively on a single factor for men and the first three questions loaded on a single factor for women. This evidence yields support for the internal validity of the factor structure of the eroticization process onset factor.

The construct of eroticization onset was also indirectly supported by its relationship to known sex differences. Considerable evidence exists that the onset of sexual behaviors and feelings occurs in close temporal contiguity to the onset of biological and physiological puberty for men, whereas similar sexual behaviors often emerge long after the onset of biological puberty for women (e.g. Gagnon & Simon, 1974; Hunt, 1974; Kinsey, et al. 1953). The reasons for this sex difference are

unknown -- perhaps it is related to socialization processes which teach men to be more aware and women to be less aware of their physical sexual development (Fisher & Byrne, 1978; Heiman, 1977; Jakobivtz, 1965), or to the fact that the growth and sexual responsiveness of the penis are more obvious than that of the clitoris (Gagnon & Simon, 1974). Nevertheless, the construct of eroticization onset is indirectly validated by the agreement between the present findings and this known sex difference.

Despite the strong evidence in support of the eroticization onset construct, the present study is open to at least one major source of potential interpretational problems, due to the use of retrospective data. At the outset, it should be noted that retrospective data per se do not necessarily pose an interpretational problem. The extent to which subjects in the present study may have had inaccurate memories of the timing of various sexual events during puberty only adds error variance to the results. The very fact that the results in the present study were so highly and consistently significant suggests that such error variance was at a minimum.

Retrospective data could pose a problem, however, if some subjects systematically distorted or misremembered sexual events around puberty. For example, it could be argued that subjects with a history of homoeroticism might be systematically biased toward remembering and/or reporting either earlier or later onset of sexual events from puberty. The fact that homosexuality is stigmatized in our society could produce bias in either direction. Individuals whose earliest fantasies and/or behaviors were homoerotic may have been more aware of them because of

stigma, and may thus recall earlier onsets of those events. Conversely, those same individuals may be likely to repress or "forget" those events because they were stigmatized, and may thus report later onset of sexual feelings and behaviors.

The present study contained a number of methodological features designed to reduce the possibility of both types of systematic bias described above. First, none of the eroticization onset questions explicitly referred to homosexuality or heterosexuality. Subjects were asked to report the ages at which they began masturbating, began feeling sexually aroused, and became aware of feelings of sexual arousal, without any reference to whether these activities were homosexual or heterosexual. Secondly, for males, one question on the eroticization onset factor had no reference to any kind of sexual behavior at all -- namely the question about the relative timing of physical growth at puberty. Third, subjects were never asked to specify an age at which they engaged in homoerotic or heteroerotic fantasies. Finally, the use of a more nearly random sample rules out or at least minimizes the distortion which might be caused by utilizing solely homosexual subjects who are overtly or exclusively gay identified. Subjects who do not consider themselves to be gay or lesbian identified may be less likely to distort their recollections regarding sexual activities than are overtly identified homosexuals for whom sexual experiences may play a more prominent role in their lives.

There is, of course, no way totally to rule out distortion due to the use of retrospective data. A study by Mussen and Jones (1957),

however, supports the present findings without reliance on retrospective data. Mussen and Jones conducted a longitudinal study of boys who were classified as early or late maturers on the basis of physical growth spurts at puberty. Later, at age 17, these boys were given Thematic Apperception Tests, which revealed less heterosexual interests among early maturing boys. Although not dealing directly with the issue of sexual orientation, Mussen and Jones' results are consistent with the present study, but were based on physical (as opposed to sexual) measures of puberty onset and real-time (as opposed to retrospective) measurement.

#### Homoeroticism Levels

A second and unique aspect of the present study involves the development and measurement of the construct of homoerotic orientation. Storms (1981) defines this construct as the major psychological variable underlying homosexual orientation, and as comprised of or manifested in the contents of an individual's erotic fantasies and the stimuli that are sexually arousing to the individual. Past researchers have acknowledged constructs similar to homoeroticism, e.g. Kinsey (Kinsey, et al., 1948), Marmor (1980), and Bell, Weinberg, and Hammersmith (1981, see further discussion below). Previous researchers have not, however, defined the construct in sufficient detail to develop comprehensive measures of it, have not attempted to validate the construct, and have not treated it as a theoretically or empirically separate variable.

In the present study the homoeroticism construct was measured by questions concerning frequency of homoerotic fantasies, frequency of

homoerotic masturbation fantasies, intensity of homoerotic fantasies, and underlying homosexual attraction. The internal validity of the factor structure was supported internally by the fact that these questions loaded significantly and exclusively on a single factor, and externally by the fact that the factor related in theoretically predicted ways.

The present development and use of the construct of homoeroticism has significant implications for the study of sexual preference in at least two ways. First, the construct provides a relatively unambiguous dependent variable which can be logically and specifically related to hypothesized independent/causal variables, as in Storms' model. In contrast, past researchers in the area of sexual orientation have typically used ambiguous or confounded dependent variables which are part of complex but seldom defined notions of "homosexuality." Examination of virtually any past theory or piece of research reveals that "homosexuality" and "homosexual subjects" are implicitly defined/selected along a number of confounded dimensions including homoeroticism, homosexual behavior, and/or self-identification of homosexuality. Furthermore, past theorists have never clearly specified which dimension or dimensions of "homosexuality" are hypothetically caused by the independent variables they have studied or theorized about. In general, the history of research on homosexuality has been marked by the absence of theories which clearly and explicitly specify causal links between independent variables and clearly defined dependent variables. The notorious failure of researchers to find support for past theories of homosexual development may be due to ambiguity about what exactly past theories

have been trying to predict.

A second important implication of the homoeroticism construct is in its potential applicability and generalizability to a broad population of individuals. Kinsey asserted that 50% of all adult males have experienced some degree of homosexual "psychic response," whereas only 4% of all males are exclusively, behaviorally homosexual. Unfortunately, researchers have focused almost entirely on the latter 4% in order to study the development of homosexuality, and have ignored the remaining 46%. As a research strategy, that is somewhat like studying the development of writing skills by sampling only Pulitzer Prize winners.

In contrast, the present study sampled a much broader range of individuals, few of whom could be classified as exclusively homosexual. It is therefore especially significant that the present results support a model of homoerotic development that is applicable to individuals who are not exclusively homosexual in behavior and identity.

That is not to say that the present study sampled as broad a population as it could have. Subjects for this study were recruited from an upper division course on the social psychology of human sexual behavior. Students who take a course in human sexuality may not be representative of all undergraduate students. As described in the methods section, the proportion of exclusively heterosexual and homosexual subjects was similar to those of college students in general (Hunt, 1974; Kinsey, et al., 1948). This study also represents a significant improvement over the limited generalizability of past research on homosexuality.

Causal Relationship between Eroticization Process Onset and Adult Homoeroticism Levels

The third and final major aspect of the present study is the hypothesized and empirically supported relationship between eroticization onset and adult homoeroticism levels. As predicted from Storms' theory, the present study produced strong evidence for a relationship between earlier eroticization process onset and higher levels of adult homoeroticization. Because of the correlational nature of the present study, however, it is necessary to discuss what type of causal conclusions can and cannot be drawn.

The use of LISREL analysis allows us to draw some firm conclusions about causal relationships in the data -- namely that the hypothesized measures of eroticization onset belong on one side of the causal equation while the hypothesized measures of adult homoeroticism belong on the opposite side. It would not fit the data, for example, to propose a causal model wherein one variable from the homoeroticism factor (e.g. basic underlying attraction toward the same sex) causes a variable on the eroticization onset factor (e.g. earlier feelings of sexual arousal) which in turn causes a variable on the homoeroticism factor (e.g. more adult homoerotic masturbation fantasies). Any alternative explanation of the above type would violate the empirically validated factor structure of eroticization onset and adult homoeroticism.

While the LISREL analyses fit perfectly with Storms' theory, they do not rule out one obvious alternative model-- a mirror image model in

which higher adult homoeroticism levels cause reporting of earlier eroticization process onset. It could be argued that adult homoeroticism levels indicate a homoerotic orientation existing before puberty which in turn led to earlier eroticization process onset for individuals already possessing that orientation, thus leading to the relationship found in the present study.

The present study does not contain the kinds of data needed to rule out such a mirror image causal explanation. This alternative explanation is made less plausible, however, by the fact the one question used to measure eroticization process onset for men dealt strictly with physical puberty onset. It is difficult for the mirror image alternative explanation to argue that a prehomosexual orientation could cause an earlier onset of physiological puberty. Finally, and perhaps more convincingly, the study by Mussen and Jones (1957) described above makes this explanation even less likely.

In addition to the "mirror image" explanation, the present results are also vulnerable to a "third factor" explanation. It could be argued that a third variable, not measured in the present study, causes both earlier eroticization onset and adult homoeroticism. An example of a "third factor" causal explanation is suggested by the stereotyped image that homosexuals are "over-sexed." A biologically determined higher sex drive might conceivably produce earlier erotic and sexual behavior and produce adult homoerotic orientations, though the specific biological and psychological mechanisms of this causal chain are not perfectly clear. Nevertheless, there is some evidence that the image of homosex-



uals as "over-sexed" may be an erroneous stereotype. Bell and Weinberg (1978) investigated this popular conception by asking homosexual subjects to report on the frequency of their sexual thoughts and the importance of sex in their lives. Bell and Weinberg combined responses to these two items into a summary measure of subjects' sexual interest. Their data do not support the notion that homosexual men and women are more obsessed with sex than heterosexuals. In summary, while it is not possible to rule out alternative causal explanations for the present data, none of the competing explanations currently in the literature can account for the present data as parsimoniously and completely as Storm's model.

#### Theoretical Implications

The present study is an improvement over past theory and research on sexual orientation in several important ways. First, this study provides an empirical measure of and evidence for eroticization process onset occurring at about the time of puberty. As such, this study suggests that critical events in erotic orientation development occur later than the vast majority of other theories posit. The present study does not rule out earlier childhood events as potentially formative in sexual development, but it does suggest that critical developmental events do occur as late as late childhood or early adolescence. Second, the present study is perhaps the only study to date to provide clearly defined measures of homoeroticism levels. This is in sharp contrast to other studies which have confounded eroticism levels with sexual orien-

tation self-identification and reports of actual sexual behavior. A third major advance is demonstrated in testing the development of homoeroticism within a sample of college students, the majority of whom do not identify themselves as homosexual. It has long been recognized that the terms "homosexual" and "heterosexual" do not describe dichotomous concepts (Kinsey, et al, 1948). Nevertheless, most research in this area has focused on determinants of homosexuality among exclusive self-identified homosexuals and has ignored the varying degrees of homosexuality among the general population.

The above advantages of the present study are clearly seen when compared with the most recent and widely publicized study of sexual preference: that of Bell, Weinberg, and Hammersmith (1981). They conducted a comprehensive study of sexual preference development based on extensive interviews with 979 "homosexual" men and women and 477 "heterosexual" men and women. Using path analysis, Bell, Weinberg and Hammersmith discovered only one strongly significant relationship -- namely between early adolescent homosexual "feelings" and adult homosexuality. Curiously, Bell, et al, dismiss this finding as spurious or self-evident (technically, the result of high multicollinearity), and conclude that adult homosexuality must be predisposed by extremely early -- possibly biological -- factors not measured in their study. In short, yet another major study of homosexuality has resulted in essentially null findings.

Bell, Weinberg, and Hammersmith's study suffers from at least one of the major methodological and theoretical flaws which have plagued

past studies and which the present study was designed to avoid -- namely, the use of extreme samples of self-identified homosexuals resulting in a confounded, multi-dimensional dependent variable and lack of theoretical specificity concerning which aspect of "homosexuality" is actually being studied. Specifically, Bell, Weinberg, and Hammersmith's sample of homosexual individuals contained subjects who were: 1) "gay" identified, 2) at the extremes in homosexual behavior, and 3) at the extremes of homoeroticism. Given the highly restricted, extreme, and confounded definition of homosexuality, it is perhaps not surprising that Bell, Weinberg, and Hammersmith failed to find a single causal variable, or even a small handful of causal variables, that predicted membership in their homosexual group. In contrast, the present study focused on a specific, clearly defined, and theoretically derived dependent variable -- homoeroticism -- and attempted to sample individuals who span the range of values on that variable. Perhaps for that reason alone, the present study was able to identify reliable predictors of adult homoeroticism levels, namely the measures of eroticization onset.

Finally, a word should be said about Bell, Weinberg, and Hammersmith's conclusion about biological determinants. While Bell et al. suggest that there is a biological predisposition toward homosexuality present from early childhood, Storms' theory points to both biological and social determinants of homoeroticism. According to Storms' model early eroticization process onset may be biologically influenced, but that, in and of itself, does not determine erotic orientation. The child's social environment is equally influential in determining erotic

orientation development.

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### Footnotes

1. An issue deserving discussion involves the use of a new statistical analysis: LISREL. Utilization of such a technique raises the question of what advantage the new technique offers over more traditional types of data analysis. The hypothesized model, based on Storm s' theory, actually contains three hypotheses: 1) that the eroticization process variables load on one factor; 2) that the homoeroticism variables load on one factor; and 3) that eroticization process onset and homoeroticism factors are related. LISREL offers the only method of testing these three hypotheses simultaneously and providing a statistic on how well the model fits the data. Traditional analyses would require performing two separate factor analyses and then obtaining a correlation coefficient for the factor scores. This would provide a test of the model in its component parts. However, LISREL allows you to test the model as a whole. Nor would traditional analyses provide you with a statistic against which to test the model's fit with the original data.

Additionally, LISREL allows us to determine the complexity of the model necessary to fit the data, in that the hypothesized model can be compared with the complete null and structural null models to see whether the hypothesized model improves the goodness-of-fit with the original data.



## PSYC 373: Social Psychology of Human Sexuality

RESEARCH QUESTIONNAIRES

The purpose of asking you to participate in research in this course is two-fold: 1) to give you the experience of answering a typical human sexuality research questionnaire, and 2) to give the professor a general idea of the experiences, attitudes, and interests of the members of this class. Every possible precaution will be taken to insure that your responses are confidential, while at the same time you will receive credit for participating in this research project. Therefore, your co-operation and your honest answers will be appreciated.

First, please fill out the questionnaire contained in your reader (Reading #1), and record your answers on the answer sheet attached to that questionnaire and hand in only the answer sheet.

Second, please fill out the supplemental questionnaire that is being handed out with this sheet, again recording your answers on the answer sheet attached to that questionnaire. You should keep the questionnaire, and hand in only the answer sheet.

Finally, write your name, sex, birthdate, and student ID number at the bottom of this page, and staple or paper-clip together this sheet, the answer sheet to the supplemental questionnaire, and the answer sheet to the questionnaire in your reader.

This sheet will be removed from your answer sheets, and will be used only to record the fact that you have participated in this research. Your name will in no way be connected to your responses on the answer sheets.

Name: \_\_\_\_\_

Student ID number: \_\_\_\_\_

Birthdate: \_\_\_\_\_

Sex:     M           F

1. How frequently do you fantasize or daydream about having a sexual experience with someone of your own sex?
  - a. Never -- I have never done this.
  - b. Once or twice -- This has happened to me only once or twice.
  - c. Once or twice a month.
  - d. Once or twice a week.
  - e. About once a day.
  - f. More than once a day.
  
2. How often do you have a fantasy about someone of your own sex when you masturbate?
  - a. Never -- I have never done this.
  - b. Once or twice -- This has happened to me only once or twice.
  - c. Once or twice a month.
  - d. Once or twice a week.
  - e. About once a day.
  - f. More than once a day.
  
3. On the average, how intense are your daydreams or fantasies about having a sexual experience with someone of your own sex? How sexually arousing are they to you?
  - a. Not applicable -- I never have such fantasies or daydreams.
  - b. Very weak -- The fantasies I have are more like just thinking about what such an experience would be like, not really getting sexually aroused.
  - c. Sometimes these fantasies give me a little bit of sexual arousal.
  - d. Often these fantasies are moderately arousing.
  - e. On occasion I get very sexually aroused by such fantasies.
  - f. I frequently get very sexually aroused by such fantasies.
  
4. How often do you have actual sexual experience with someone of your own sex?
  - a. Never -- I have never done this.
  - b. Once or twice -- This has happened to me only once or twice.
  - c. Once or twice a month.
  - d. Once or twice a week.
  - e. About once a day.
  - f. More than once a day.

5. Throughout your life, at what ages can you remember having had sexual feelings toward or sexual fantasies about members of your own sex? Mark all ages that apply.
- |      |       |       |          |
|------|-------|-------|----------|
| a. 6 | e. 10 | i. 14 | m. 18    |
| b. 7 | f. 11 | j. 15 | n. 19    |
| c. 8 | g. 12 | k. 16 | o. 20    |
| d. 9 | h. 13 | l. 17 | p. NEVER |
6. Throughout your life, at what ages can you remember having had actual sexual experiences with members of your own sex? Mark all ages that apply.
- |      |       |       |          |
|------|-------|-------|----------|
| a. 6 | e. 10 | i. 14 | m. 18    |
| b. 7 | f. 11 | j. 15 | n. 19    |
| c. 8 | g. 12 | k. 16 | o. 20    |
| d. 9 | h. 13 | l. 17 | p. NEVER |
7. How frequently do you fantasize or daydream about having a sexual experience with someone of the opposite sex?
- Never -- I have never done this.
  - Once or twice -- This has happened to me only once or twice.
  - Once or twice a month.
  - Once or twice a week.
  - About once a day.
  - More than once a day.
8. How often do you have a fantasy about someone of the opposite sex when you masturbate?
- Never -- I have never done this.
  - Once or twice -- This has happened to me only once or twice.
  - Once or twice a month.
  - Once or twice a week.
  - About once a day.
  - More than once a day.
9. On the average, how intense are your daydreams or fantasies about having a sexual experience with someone of the opposite sex? How sexually arousing are they to you?
- Not applicable -- I never have such fantasies or daydreams.
  - Very weak -- The fantasies I have are more like just thinking about what such an experience would be like, not really getting sexually aroused.

9. Continuing

- c. Sometimes these fantasies give me a little bit of sexual arousal.
- d. Often these fantasies are moderately arousing.
- e. On occasion I get very sexually aroused by such fantasies.
- f. I frequently get very sexually aroused by such fantasies.

10. How often do you have actual sexual experiences with someone of the opposite sex?

- a. Never -- I have never done this.
- b. Once or twice -- This has happened to me only once or twice.
- c. Once or twice a month.
- d. Once or twice a week.
- e. About once a day.
- f. More than once a day.

11. Throughout your life; at what ages can you remember having had sexual feelings toward or sexual fantasies about members of the opposite sex. Mark all ages that apply.

- |      |       |       |          |
|------|-------|-------|----------|
| a. 6 | e. 10 | i. 14 | m. 18    |
| b. 7 | f. 11 | j. 15 | n. 19    |
| c. 8 | g. 12 | k. 16 | o. 20    |
| d. 9 | h. 13 | l. 17 | p. NEVER |

12. Throughout your life, at what ages can you remember having had actual sexual experiences with members of your own sex? Mark all ages that apply.

- |      |       |       |          |
|------|-------|-------|----------|
| a. 6 | e. 10 | i. 14 | m. 18    |
| b. 7 | f. 11 | j. 15 | n. 19    |
| c. 8 | g. 12 | k. 16 | o. 20    |
| d. 9 | h. 13 | l. 17 | p. NEVER |

13. How frequently do you experience the feeling of being sexually aroused?

- a. Never -- I have never done this.
- b. Once or twice -- This has happened to me only once or twice.
- c. Once or twice a month.
- d. Once or twice a week.
- e. About once a day.
- f. More than once a day.

14. Throughout your life, at what ages can you remember having experienced the feeling of being "sexually aroused"? Mark all ages that apply.

- |      |       |       |          |
|------|-------|-------|----------|
| a. 6 | e. 10 | i. 14 | m. 18    |
| b. 7 | f. 11 | j. 15 | n. 19    |
| c. 8 | g. 12 | k. 16 | o. 20    |
| d. 9 | h. 13 | l. 17 | p. NEVER |

15. How frequently do you masturbate?

- Never -- I have never done this.
- Once or twice -- This has happened to me only once or twice.
- Once or twice a month.
- Once or twice a week.
- About once a day.
- More than once a day.

16. Throughout your life at what ages can you remember having masturbated? Mark all ages that apply

- |      |       |       |          |
|------|-------|-------|----------|
| a. 6 | e. 10 | i. 14 | m. 18    |
| b. 7 | f. 11 | j. 15 | n. 19    |
| c. 8 | g. 12 | k. 16 | o. 20    |
| d. 9 | h. 13 | l. 17 | p. NEVER |

17. How frequently do you have any kind of sexual experience to the point of orgasm, including masturbation, wet-dreams, and sex with other people?

- Never -- I have never done this.
- Once or twice -- This has happened to me only once or twice.
- Once or twice a month.
- Once or twice a week.
- About once a day.
- More than once a day.

18. Overall, do you think you have a weaker or stronger sex drive than most of the people you know of your age and sex?

- very much weaker sex drive
- somewhat weaker sex drive
- slightly weaker sex drive
- exactly average level of sex drive
- slightly stronger sex drive
- somewhat stronger sex drive
- very much stronger sex drive

19. Try to remember back to when you were just entering puberty. Do you think you became aware of your own sex drive and sexual arousal earlier or later than most people of your sex?

- a. very much earlier
- b. somewhat earlier
- c. slightly earlier
- d. exactly average
- e. slightly later
- f. somewhat later
- g. very much later

20. In terms of physical growth, did you enter puberty younger or older than most of your friends and classmates?

- a. very much younger
- b. somewhat younger
- c. slightly younger
- d. exactly average
- e. slightly older
- f. somewhat older
- g. very much older

21. During junior high school, were you younger or older than most of your friends?

- a. very much younger
- b. somewhat younger
- c. slightly younger
- d. exactly average
- e. slightly older
- f. somewhat older
- g. very much older

22. At what age did you start dating the opposite sex?

- |      |       |       |          |
|------|-------|-------|----------|
| a. 6 | e. 10 | i. 14 | m. 18    |
| b. 7 | f. 11 | j. 15 | n. 19    |
| c. 8 | g. 12 | k. 16 | o. 20    |
| d. 9 | h. 13 | l. 17 | p. NEVER |

23. At what age did you first start to date a person of the opposite sex on a regular basis (e.g. "going steady")?

- |      |       |       |          |
|------|-------|-------|----------|
| a. 6 | e. 10 | i. 14 | m. 18    |
| b. 7 | f. 11 | j. 15 | n. 19    |
| c. 8 | g. 12 | k. 16 | o. 20    |
| d. 9 | h. 13 | l. 17 | p. NEVER |

24. Regardless of what sexual experiences you've actually had, how much basic, underlying sexual attraction do you feel toward members of your own sex? Answer on a scale from 0 to 10, where 0 = absolutely no sexual attraction toward members of your own sex, and 10 = an extremely high amount of sexual attraction toward members of your own sex. (Circle a number between 1 and 10 on your answer sheet.)

25. Regardless of what sexual experiences you've actually had, how much basic, underlying sexual attraction do you feel toward members of the opposite sex? Answer on a scale from 0 to 10, where 0 = absolutely no sexual attraction toward members of opposite sex, and 10 = an extremely high amount of sexual attraction toward members of the opposite sex. (Circle a number between 0 and 10 on your answer sheet.)

26. How old were you, to the nearest month, on the day that you graduated from high school? E.g. if you turned 17 in April of your senior year in high school, and you graduate from high school that May, you would have been 17 years and 1 month old when you graduated. Write the years and months on your answer sheet.





Females

Variable	Standard Deviation
01	1.1511
02	0.8707
03	1.4810
04	3.4883
05	3.1755
06	4.7138
07	1.3650
08	1.5326

Covariance Matrix

	02	03	04	05	06	07	08
01	0.8412	1.5034	3.0517	-1.3273	-2.8232	-0.3816	-0.1943
02		1.0610	2.3203	-1.0035	-2.1476	-0.1409	-0.0058
03			4.0356	-1.8720	-3.6481	-0.2499	-0.0687
04				-3.7254	-7.0128	-1.0740	-0.7698
05					9.8974	1.7200	0.9249
06						1.6218	1.2500
07							1.2853