

# Sexual Knowledge and Attitude Test for Adolescents

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The Sexual Knowledge and Attitude Test for Adolescents (SKAT-A) is a developmentally appropriate, paper-and-pencil self-report questionnaire for assessing subjective evaluations and knowledge proficiency regarding sexual behavior and sexual experience for adolescents (Fullard, Scheier & Lief, 2005).

## Description

The current version of the SKAT-A (2005) represents a considerable revision from the previous two versions (e.g., Fullard, Johnston, & Lief, 1998; Lief, Fullard, & Devlin, 1990). The original Sexual Knowledge and Attitude Scale (Lief & Reed, 1972) was developed for use with adult health professionals and is described in detail by Lief (1988). Previous versions of the adolescent-focused test were constructed to be appropriate for youth ages 12–18 and utilized the original SKAT as a basis for developing and constructing scales. Sections collecting demographic information and sexual behavior were added to equip the SKAT-A for broad-based use in a variety of settings including program evaluations, and educational courses in human sexuality, and as a means to collect relevant information about adolescent sexuality not otherwise available. The SKAT-A is also suitable for use with young adults.

The SKAT-A contains 40 attitudinal items with a 5-point Likert-type response format ranging from 1 = *Strongly Agree* to 5 = *Strongly Disagree*. Eleven of the attitudinal items are reverse scored. Preliminary exploratory factor analysis resulted in five content scales (Masturbation, Homosexuality, Pornography, Premarital sex, and Abortion).

A confirmatory factor analysis model was configured with simple structure. Based on prior factor analytic work with a young adult sample (Fullard et al., 1998), six factors were specified tapping Premarital Sexuality, Rape/Coercion, Masturbation, Abortion, Homosexuality, and Pornography. This base six-factor model fit adequately,  $\chi^2(465) = 3861.98$ ,  $p < .001$ , Comparative Fit Index (CFI: .831), Root Mean Square Error of Approximation (RMSEA = .051), and Standardized Root Mean Residual

(SRMR = .065).<sup>2</sup> The six factors were all psychometrically reliable with significant factor loadings (all  $ps < .001$ ). Average loadings within factors ranged from  $\lambda = .61$  for Masturbation to  $\lambda = .40$  for Abortion.

Table 1 contains the factor intercorrelations (estimates of internal consistency are on the diagonal). A model positing a higher-order factor structure did not improve appreciably on the primary first-order model,  $\Delta\chi^2(37) = 2767.46$ ,  $p < .001$ .

The SKAT-A also includes 40 trichotomously scored knowledge items (*True, False, and Not Sure*). Scale scores are derived by assigning a 1 to correct responses and 0 to incorrect answers. The response *Not Sure* is not penalized in the computation of knowledge proficiency scale scores (number correct—number incorrect). Six proficiency scales assess knowledge of pregnancy/contraception, abstinence/sexual awareness, orgasm, masturbation, negative consequences of sex, and homosexuality.

The Sexual Behavior Inventory obtains information about a wide variety of sexual and experiential behaviors including dating experience, onset of sexual activity, contraceptive practices, number of sexual partners, sexually transmitted diseases and other experiences relevant to adolescent sexuality and education.

**TABLE 1**  
Correlations Among Latent Factor Constructs From Six-Factor Model

	F1	F2	F3	F4	F5	F6
Premarital						
Sexuality (F1)	.71	.10	.29**	.49***	-.15*	.65***
Rape/Coercion (F2)		.71	.46***	.48**	-.40***	.36***
Masturbation (F3)			.78	.55***	-.58***	.67***
Abortion (F4)				.50	-.60***	.46***
Homosexuality (F5)					.74	-.29**
Pornography (F6)						.54

Note: Numbers on diagonals are error-free estimates of internal consistency computed using Werts, Linn, & Jöreskog's (1974) formula (reliability presented as unstandardized alpha).

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

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<sup>2</sup>The model fit indices could be improved considerably with the addition of correlated residuals and cross-factor loadings. This would likely improve the CFI, which should hover above .95 (Hu & Bentler, 1998), and reduce the magnitude of both the RMSEA and SRMR (both of which should be below .05 indicating the amount of off-diagonal residual variances unaccounted for by the hypothetical model). However, for the purpose of deriving *pure* factor loadings and providing a basis for cross-validation with a moderately small sample, we chose to model simple structure and not to include any model refinements based on post-hoc specification searches. In addition, the robust nature of correlated residuals has been brought into question with Monte Carlo simulations with  $N$ s less than 500, a number that approximates our sample size (MacCallum, 1986).

## Response Mode and Timing

With standard survey administration procedures, the SKAT-A can be completed in 20–30 minutes. The Attitude and Knowledge sections include forced-choice question formats. The Demographics and Behavior sections require a combination of checked items (e.g., grade in school) and open-ended questions (e.g., age of first menstrual period, father's occupation).

## Reliability

The psychometric information presented here is based on a sample ( $N = 516$ ) of urban high school students (59% female; 9th through 12th grades) from a northeastern city. The mean age of the sample was 16.7 (range 15 to 20 years). Racial self-identification indicated 19.5% White, 20% African American, 19.0% African Caribbean, 18% Hispanic, 10% Asian, and 13.5% Other. Some comparative information is included from a sample of college students at an urban university in the northeast ( $N = 240$ ; 74% female; mean age = 23.0; racial self-identification: 58% White, 31% African American, 5% Hispanic, 4% Asian, 2% Other; Fullard et al. 1998; Johnston, 1998).

Reliability analyses of the five derived attitudinal subscales indicated adequate reliability (see Fullard et al., 1998), with adequate internal consistency coefficients (.84 for high school students, .88 for college students). Test-retest coefficients over a 2-week period were .88 (high school sample,  $N = 45$ ) and .89 (college sample,  $N = 52$ ; Fullard et al., 1998; Johnston, 1998).

Total scale reliabilities for the knowledge items are as follows: internal consistency (high school sample = .79, college sample = .75); test-retest stability over a 2-week period was .78 (high school sample) and .85 (college sample; Fullard et al., 1998; Johnston, 1998).

## Validity

We examined the associations between the six latent factors and various sexual behavior measures. Space limitations do not permit presenting of all of these relations; however, the most pronounced were between a 7-item scale assessing frequency of sexual experiences (e.g., dating, kissing, petting, oral sex;  $\alpha = .80$ ) and Premarital Sexuality attitudes ( $r = .42, p < .001$ ) followed by Pornography attitudes ( $r = .35, p < .001$ ). Other notable associations included intercourse with Premarital Sexuality attitudes ( $r = .31, p < .001$ ) and with Pornography attitudes ( $r = .18, p < .05$ ). Reports of homosexual experiences were inversely related to Rape/Coercion attitudes ( $r = -.14, p < .05$ ) and abortion attitudes were related to the use of contraception ( $r = .28, p < .01$ ).

*Associations between knowledge and behavior.* Mean levels of proficiency for the six knowledge scales were 33% (pregnancy), 25% (virginity), 27% (orgasm), 28% (masturbation), 33% (negative consequences), and 32%

(homosexuality). It should be noted that knowledge scores were substantially higher with the college sample, as would be expected. The low proportion of youth scoring correct and moderate skew for all six scales indicated the knowledge items are difficult for this age group. Knowledge of orgasm issues had the largest association with a composite tapping frequency of sexual behavior ( $r = .15, p < .01$ ), followed by knowledge of masturbation issues ( $r = .11, p < .05$ ). Relations between the six knowledge scales and behavior indicated that more knowledge of abstinence/sexual awareness was related to frequency of contraceptive use ( $r = .24, p < .01$ ), knowledge of homosexuality issues was related to contraception ( $r = .24, p < .01$ ) and inversely with frequency of contraceptive use ( $r = -.15, p < .05$ ). A similar comparison with the college sample may be found in Fullard et al. (1998).

*Associations between attitudes and knowledge.* Correlations between the six attitudinal latent factors and the six knowledge scale scores indicated relatively low overlap between knowledge and Premarital Sexuality attitudes ( $r_{\text{avg}} = .07$  for the six associations), and likewise relatively low associations with Rape ( $r_{\text{avg}} = .10$ ), Masturbation ( $r_{\text{avg}} = .13$ ), Abortion ( $r_{\text{avg}} = .12$ ), Homosexuality ( $r_{\text{avg}} = .12$ ), and Pornography attitudes ( $r_{\text{avg}} = .12$ ). Overall, these patterns indicate a clear divergence between attitudinal and knowledge proficiency scales. See Fullard et al. (1998) for attitude/knowledge relationships in the college sample.

## Other Information

The SKAT-A is registered with the U.S. Copyright Office (Fullard, Scheier, & Lief, 2005) and available from LARS Research Institute, Inc. ([www.larsri.org](http://www.larsri.org)). A nominal handling fee is charged.

Lawrence M. Scheier is also affiliated with Washington University, St. Louis, Cornell University, and the Department of Public Health, Division of Prevention and Health Behavior, Institute for Prevention Research. Howard I. Lief is deceased.

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## Mathtech Questionnaires: Sexuality Questionnaires for Adolescents

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The questionnaires have two purposes: first, to measure the most important knowledge areas, attitudes, values, skills, and behaviors that either facilitate a positive and fulfilling sexuality or reduce unintended pregnancy among adolescents; and second, to measure important possible outcomes of sexuality education programs.

The Center for Disease Control funded Mathtech, a private research firm, to develop methods of evaluating sexuality education programs. Mathtech reviewed existing questionnaires for adolescents and determined that it was necessary to develop new questionnaires. With the help of about 20 professionals in the field of adolescent sexuality and pregnancy, Mathtech identified more than 100 possible outcomes of sexuality education programs and then had 100 professionals rate (anonymously) each of those outcomes according to its importance in reducing unintended pregnancy and facilitating a positive and fulfilling sexuality. Mathtech then calculated the mean ratings of those outcomes and developed questionnaires to measure many of the most important outcomes. The questionnaires, which measure these important outcomes, include the Knowledge Test, the Attitude and Value Inventory, and the Behavior Inventory.

### KNOWLEDGE TEST

#### Description

The Knowledge Test is a 34-item multiple-choice test. It includes questions in the following areas: adolescent physical development, adolescent relationships, adolescent sexual activity, adolescent pregnancy, adolescent marriage, the probability of pregnancy, birth control, and sexually transmitted disease. It has been used successfully with both junior and senior high school students.

To develop the questionnaires, we completed the following steps: (a) generated between 5 and 20 items in each

of the content areas that the 100 professionals indicated as important; (b) pretested the questionnaire with small groups of adolescents and adults, and clarified many items; (c) administered the questionnaire to 729 adolescents, analyzed their answers, removed items that were too easy or too difficult, and also removed items not positively related to the overall test score; (d) removed questions from content domains that had too many questions; and (e) made numerous refinements following subsequent administrations of the questionnaires and reviews by other professionals.

#### Response Mode and Timing

Respondents circle the single best answer to each question. Bright students commonly take about 15 to 20 minutes; slower students may take as long as 45 minutes to complete the questionnaire.

#### Scoring

The answers to the test are included at the end of the test (see the Exhibit). To obtain the percentage correct, count the number of correct answers and divide by 34. No special provisions are made for students who do not answer questions.

#### Reliability

The test was administered to 58 adolescents on one occasion, and then again 2 weeks later. The test-retest reliability coefficient was .89.

#### Validity

Older students obtained higher scores than younger students; and students with overall higher grade point

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