



Evaluative Indices Assigned to Contraceptive Methods by University Undergraduates

Robert J. McDermott, Teri L. Malo, Virginia J. Dodd, Ellen M. Daley, and Alyssa B. Mayer

ABSTRACT

Background: Preordinate attitudes and beliefs about contraception may influence acceptance or rejection of a particular method. **Purpose:** We examined the attitudes about contraception methods held by undergraduate students (N=792) at two large southeastern universities in the United States. **Methods:** Twelve methods were rated on 40 semantic differential scales. Means of the scale sum scores for men and women were compared using t-tests. **Results:** Among women the most favorably rated methods were: abstinence, oral contraceptive, male condom, Nuva ring, contraceptive patch, emergency contraception, male sterilization, female sterilization, diaphragm and female condom, each yielding a mean above the scale midpoint. The most negatively rated methods were withdrawal and douche. For men, the ratings in descending order were: oral contraceptive, male condom, abstinence, contraceptive patch, emergency contraception, female sterilization, Nuva ring, female condom, diaphragm, withdrawal, male sterilization and douche. There were four statistically significant ($P < 0.05$) gender differences, with abstinence, male condom, male sterilization and Nuva ring all rated more favorably by women. **Discussion:** These evaluative indices suggest that contraceptive methods elicit varied responses among potential users that theoretically could manifest themselves in acceptance or rejection of a particular method. Improved understanding of the traits by which potential users judge contraception may be beneficial in fostering communication between potential users and practitioners who provide relevant advice. **Translation to Health Education Practice:** Health educators and other practitioners engaged in contraception counseling must consider that persons may already hold strong feelings about some methods before they enter the clinical setting.

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BACKGROUND

Engaging in sexual activity is, arguably, a typical aspect of life for the college or university student. In one study, whereas 49% of students entering college in the fall had never had sex, by spring of their first year, that percentage had dropped to 28%.¹ In another investigation, among 1,168 college students surveyed, 74% of freshmen, 84% of sophomores, 87% of juniors and 90% of seniors disclosed being sexually active.² For 50% of college women, their

first sexual intercourse is unplanned,³ and for 27% of them, it occurs under the influ-

Robert J. McDermott is a professor in the Department of Community and Family Health, University of South Florida, Tampa, FL, 33612; E-mail: rmcdermo@health.usf.edu. Teri L. Malo is a research associate in the Department of Community and Family Health, University of South Florida, Tampa, FL, 33612. Virginia J. Dodd is an associate professor in the Department of Health Education and Behavior,

ence of alcohol.⁴ Individuals engaging in high risk sexual behavior (e.g., unprotected

University of Florida, Gainesville, FL, 33611. Ellen M. Daley is an associate professor in the Department of Community and Family Health, University of South Florida, Tampa, FL, 33612. Alyssa B. Mayer is a graduate research assistant in the Department of Community and Family Health, University of South Florida, Tampa, FL, 33612.



sex, multiple or casual sex partners, coincidental risk behaviors such as alcohol or other drug use) increase their likelihood of experiencing negative consequences such as sexually transmitted infections (STIs) or unintended pregnancy.⁵⁻⁷

Women in college 20 to 24 years of age have one of the highest rates of unintended pregnancy due to lack of contraceptive use and unsafe sexual practices.⁸ More than 80% of college-aged women are sexually active but are *not* seeking to become pregnant.⁸ Approximately 12% of college students report either experiencing or being involved in an unplanned pregnancy⁹ and 52% report having had an unplanned pregnancy “scare” at least once.¹⁰

Preventing unintended pregnancy and reducing rates of STIs are important health objectives that may be met by encouraging the use of acceptable and effective contraceptive methods. However, preordinate attitudes and beliefs about contraception may influence acceptance or rejection of a particular method.^{11,12}

Semantic differential scales can be used to study attitudes and reactions to various words or terms, as many words have both a denotative (i.e., dictionary definition) and connotative (i.e., representational) meaning. Previous experience and sets of beliefs may help shape individuals’ representational interpretations of words, and thus, different people may assign contrasting connotations to the same word.¹³ Semantic differential scales have been used to measure the connotative meaning an individual assigns to a construct,¹³ including contraception and other sexuality-related concepts.^{11,14-18}

Research on connotative meanings assigned to contraceptive options has focused on traditional methods of birth control.^{11,16,17,19} McDermott and Gold^{16,17} examined connotative meanings assigned to ten contraceptive options (*condom, diaphragm, douche, female sterilization, IUD, male sterilization, oral contraceptive, rhythm, spermicide* and *withdrawal*). Sarvela et al.¹¹ increased the overall number of methods to 13 by adding *abstinence, the contraceptive sponge, and the vaginal suppository* for

consideration. Other researchers focused exclusively on college students’ semantic evaluation of the *male condom*.¹⁹ Because semantic or connotative examination of attitudes about contraception has not been conducted recently, research is warranted to track the changing attitudes and popularity of traditional methods as well as to assess newer contraceptive technologies. Previous research also has indicated the existence of both sex differences and similarities in contraception method evaluation that further warrants clarification and periodic monitoring through updated research.^{11,16,17,19}

PURPOSE

In this research we measured undergraduate students’ attitudes toward various contraception methods and determined specific evaluative indices. In addition, we examined the comparative evaluative indices of contraception options by sex.

METHODS

Choice of Measures

A semantic differential (i.e., bipolar adjective) scale estimates the connotative meaning of a term (construct) for an individual.¹³ A series of these scales can be summed to yield an overall score (evaluative index) for a given construct. Kee and Darroch¹⁴ referred to these sum scores as “acceptability scores.” Some researchers have interpreted these scores as a person’s attitude toward the construct under consideration.^{13,16,17,20-23} Semantic differential scales are easy and economical ways to study people’s attitudes. They also are flexible and adaptable in that they can be used with children and adults alike.²¹ Moreover, they have demonstrated validity across some languages and cultures.^{18,21,24,25}

Instrument Development

The bipolar adjective word pairs were the 40 pairs presented by Kee and Darroch¹⁴ and used by other researchers, in whole,^{16,17} or in part.¹¹ These word pairs are shown in Table 1. The specific contraceptive methods examined were solicited from students at the participating universities as a mechanism

for ensuring familiarity and contemporary relevance. Whereas most of the traditional methods of contraception emerged, so did ones that would have been unfamiliar or unavailable during previous investigations (e.g., *Nuva ring, contraceptive patch, emergency contraception*). Written instructions were adapted from instruments used in the past by other researchers.^{18,26} Thus, an instrument emerged containing 12 contraceptive methods that were rated with respect to 40 bipolar adjective pairs where scoring was based on a seven-point scale from -3 to +3 with a 0 midpoint.

The instrument underwent two rounds of pilot testing to verify the clarity of written instructions, to illuminate concerns about familiarity with the contraception terms, and to assess test-retest reliability. Pearson test-retest correlations for the adjective pairs ranged from $r = .48$ to $r = .93$, comparable to the range ($r = .53$ to $r = .92$) reported by earlier researchers^{16,17} who used the identical set of adjective pairs. The 12 contraceptive methods assessed included *abstinence, contraceptive patch, diaphragm, douche, emergency contraception, female condom, female sterilization, male condom, male sterilization, Nuva ring, oral contraceptive* and *withdrawal*.

Data Collection Procedures

During 2006, students completed paper-and-pencil surveys in classrooms where each class contained an average of 30 students (range of 21 to 40). Written directions for completing the survey were provided, including examples for selecting a response on the -3 to +3 scoring scale. Administration and supervision was performed by graduate teaching assistants who were informed of the purpose of the study and the survey protocol. Students had up to 50 minutes to complete the instrument. All respondents were volunteers who could opt out of completing the survey without negative consequences. No specific identifying information was sought on the survey and completed instruments were placed in aggregate form in a large envelope. Just 29 surveys were returned completely blank but 792 usable surveys were submitted. The protocol for



this study independently received expedited approval by the institutional review boards of the respective universities.

Data Analysis

Survey data were entered manually into an SPSS for Windows template. Univariate analyses included frequencies and percentages. Scores for the individual adjective pairs were summed with respect to each contraception option. Contraception options were ranked for men and women based on mean scores. Finally, the means of the scale sum scores for each method were compared for men and women using *t*-tests. The criterion for statistical significance was set at 0.05.

RESULTS

Participants were all undergraduate students enrolled in sections of personal health courses taken primarily by freshmen and sophomores at two large southeastern universities. Women comprised 69.2% (*N*=548) of respondents and men comprised 29.0% (*N*=230), with 1.8% (*N*=14) not specifying their sex. Participants' mean age was 19.28 years (range 18 to 30 years). In all, 61.4% of the students reported themselves to be white, 16.9% black, 5.9% Asian, 1.2% Native American, Alaska Native, Native Hawaiian or Other Pacific Islander, and 9.5% "mixed" or "other" racial background. Approximately 13.6% declared themselves to be of Hispanic or Latino/Latina ethnicity. With respect to religion, 40.0% said they were Protestant, 28.2% were Roman Catholic, 3.8% were Jewish, 10.9% reported themselves to be of other religious denominations, and 14.1% said they followed no religious doctrine or tradition. About 93.2% of the respondents identified themselves as heterosexual, 2.5% as homosexual, and 2.1% as bisexual. Respondents were predominantly never married (91.0%), but 1.4% were presently married, and 0.5% were divorced. Virtually all students (94.1%) were U.S. citizens, and 88.4% said that English was their primary spoken language.

Rankings for the 12 contraceptive methods based on mean sum scores are shown in Table 2. Among women the most favorably rated methods were: *abstinence* (1.52), *oral*

contraceptive (1.45), *male condom* (1.27), *Nuva ring* (0.68), *contraceptive patch* (0.62), *emergency contraception* (0.54), *male sterilization* (0.40), *female sterilization* (0.29), *diaphragm* (0.20), and *female condom* (0.14), each yielding a mean above the scale midpoint. The most negatively rated methods were *withdrawal* (-0.15) and *douche* (-0.53). For men, the ratings in descending order were: *oral contraceptive* (1.44), *male condom* (1.04), *abstinence* (0.87), *contraceptive patch* (0.55), *emergency contraception* (0.51), *female sterilization* (0.50), *Nuva ring* (0.33), *female condom* (0.22), *diaphragm* (0.15), *withdrawal* (0.10), *male sterilization* (0.09), and *douche* (-0.47).

Means and standard deviations for men and women are provided in Table 3. There were four statistically significant sex differences, with *abstinence*, *male condom*, *male sterilization* and *Nuva ring* all rated more favorably by women.

DISCUSSION

The evaluative indices or acceptability scores assigned to 40 possible attributes suggest that contraceptive methods elicit varied responses among potential users. Notably, however, the means of the sum scores indicate that contraception of most varieties is viewed favorably by women and men alike, a finding also seen by Bryant.⁸ Among women, the mean sum scores for 10 of the 12 contraception options were in the positive portion of the scale; among men, 11 of 12 were in the positive range.

Albeit to somewhat different degrees, *abstinence*, *male condom* and the *oral contraceptive* received the most favorable ratings from both men and women. Whereas some social desirability response bias cannot be ruled out, the relatively high rating given to *abstinence* may suggest an emerging desire to delay or limit sexual intercourse, or suggest that the perceived risk of acquiring an STI manifests itself more in this cohort of students than in previous cohorts. In contrast to a 1990 study,¹¹ *abstinence* received a higher acceptability score from both women and men in the present cohort. Similar to what Sarvela et al.¹¹ noted in their findings,

Table 1. Semantic Word Pairs Used to Evaluate 12 Contraceptive Methods

uncomfortable – comfortable
obtrusive – unobtrusive
old-fashioned – modern
unsuccessful – successful
difficult – easy
inflexible – flexible
immoral – moral
unhealthy – healthy
abrasive – non-abrasive
harmful – harmless
cold – hot
painful – painless
visible – invisible
frustrating – satisfying
inefficient – efficient
sad – happy
unavailable – available
ineffective – effective
stupid – clever
time consuming – quick
inconvenient – convenient
heavy – light
illegal – legal
distressful – non-distressful
messy – non-messy
bad – good
embarrassing – non-embarrassing
unnatural – natural
temporary – permanent
obvious – discreet
unpleasurable – pleasurable
stressful – stress free
unsafe – safe
insufficient – sufficient
expensive – inexpensive
unacceptable – acceptable
boring – exciting
foul – fragrant
ugly – attractive
unreliable – reliable



Table 2. Ranking of 12 Contraception Methods by University Women and Men

Women			Men	
Method	Score	Rank	Method	Score
Abstinence	1.52	1	Oral contraceptive	1.44
Oral contraceptive	1.45	2	Male condom	1.04
Male condom	1.27	3	Abstinence	0.87
Nuva ring	0.68	4	Contraceptive patch	0.55
Contraceptive patch	0.62	5	Emergency contraception	0.51
Emergency contraception	0.54	6	Female sterilization	0.50
Male sterilization	0.41	7	Nuva ring	0.33
Female sterilization	0.29	8	Female condom	0.22
Diaphragm	0.20	9	Diaphragm	0.15
Female condom	0.14	10	Withdrawal	0.11
Withdrawal	-0.15	11	Male sterilization	0.09
Douche	-0.53	12	Douche	-0.47

Table 3. Sex Differences in Mean Scale Scores of 12 Contraception Methods

Method	Women		Men		P
	Mean	SD	Mean	SD	
Abstinence	1.52	1.06	0.87	1.12	0.0001*
Contraceptive patch	0.61	0.89	0.55	0.86	0.635
Diaphragm	0.20	0.63	0.15	0.57	0.554
Douche	-0.53	0.95	-0.47	0.84	0.657
Emergency contraception	0.54	0.86	0.51	0.77	0.768
Female condom	0.14	0.68	0.22	0.62	0.424
Female sterilization	0.29	0.77	0.50	0.79	0.054
Male condom	1.27	0.76	1.04	0.78	0.034*
Male sterilization	0.40	0.79	0.09	1.04	0.016*
Nuva ring	0.68	0.87	0.33	0.65	0.001*
Oral contraceptive	1.45	0.99	1.44	0.90	0.952
Withdrawal	-0.15	0.94	0.10	1.06	0.059

* P < 0.05



however, women (Mean = 1.52) still are significantly more positive in their assessment of *abstinence* ($P < 0.0001$) than are men (Mean = 0.87). Women may perceive themselves at disproportionate risk because they can become pregnant and because certain STIs can have far reaching consequences for them such as persistent infection, infertility, and life-threatening conditions such as cervical cancer.^{27,28} Public health authorities may find these results encouraging for the credibility of health promotion programs aimed at reducing STI and unintended pregnancy rates.

A 1985 study of 285 female and 316 male college students' reactions to ten contraceptive methods across the same 40 adjective pairs used in the current study found that the five methods most acceptable to men all required women to assume primary contraceptive responsibility.¹⁶ Moreover, neither sex found the *male condom* to be particularly acceptable. Based on current data, the *male condom* is unquestionably a more acceptable and highly rated contraceptive option than in 1985. Although rated favorably by men and women alike in the current study, its evaluative index was significantly higher among women (1.27) than among men (1.04).

In the 1985 cohort, the most favorable contraception option to men and women alike was the *oral contraceptive*.¹⁶ Whereas it still has the highest acceptability score among men, its overall ranking is second now to *abstinence* among women.

McDermott and Gold¹⁶ found that the second ranked contraceptive method among female college students was *male sterilization*. In the current study, whereas the significantly more favorable rating ($P = 0.016$) given to *male sterilization* by women (0.40) than by men (0.09) may not be signaling that women advocate for such a strategy, it may indeed suggest that women continue to support contraception alternatives that involve men's active participation and that they protest a certain degree of sexism that characterizes 21st century contraceptive technology.

More recently introduced or popularized forms of contraception (i.e., *Nuva ring*,

contraceptive patch, *emergency contraception*) ranked in the second quartile of ratings overall among women (4th, 5th, and 6th respectively) and only modestly differently among men (7th, 4th, and 5th respectively). Only the *Nuva ring* was given an evaluative index significantly higher ($P = 0.001$) by women (0.68) than by men (0.33).

Two unreliable contraception methods (*withdrawal* and *douching*) both were rated in the bottom quartile of ratings, with *douching* actually receiving negative mean acceptability scores by both women and men. The relatively low rating given to *douching* may indicate students' understanding that it is an awkward, ineffective, and potentially harmful contraceptive method, a finding that should come to the delight of public health authorities and family planning advocates.

Contrary to previous research in which it was rated third out of ten methods,¹¹ the *diaphragm* was given a much lower rating in the current study (9th out of 12 methods). Relatively speaking, the *female condom* also was ranked low by both men and women. These findings may indicate a greater emerging discomfort or awkwardness in this cohort surrounding barrier methods that involve insertion into the female genitalia prior to sexual intercourse. Alternatively, they could simply reflect unfamiliarity with these particular barrier methods.

Study Limitations and Strengths

This study is limited by its use of a convenience sample, responsible in part for the overrepresentation of women in the group of respondents. Further, because the respondents were relatively young (mean age = 19.28 years) their actual familiarity with, and understanding of, as well as their user experience with many of the 12 contraception options presented can be questioned. Moreover, none of the respondents were excluded because of their sexual orientation, marital status, religion, absence of English language primacy, or other demographic characteristic, possibly contributing error to the overall indices reported. In addition, the 12 contraception options were examined as independent entities, i.e., a combination

method such as *oral contraceptive + male condom* was not an option that could be rated. Examination of these two methods or other methods independently may obscure or alter their acceptability index if they were to be used in combination. Furthermore, the study is cross-sectional and is just a snapshot in time. Attitudes, perceptions, preferences and actual use of contraception options may shift over time. For example, Siegal, Klein, and Roghmann²⁹ found that whereas men's use of condoms at first intercourse remained stable from freshman to senior year, women's use of condoms at first intercourse increased from one year to the next. Additionally, whereas oral contraceptive use increased from freshman to senior year, condom use remained flat.²⁹ Finally, no adjustment to control for Type I error rate inflation was made, thereby opening the possibility that some of the statistically significant relationships that were reported could be due to the issue of familywise error.^{30,31}

These limitations notwithstanding, the current study builds on other attempts to monitor and track attitudes about contraception options, focusing in particular on some of the subtleties that may comprise perceptions and attitudes, and ultimately, influence choice, continuity, and effectiveness of methods. Using the concept of evaluative indices^{16,17} or acceptable scores,¹⁴ the current study traces and compares changes in contraception attitudes during the 1980s, 1990s, and early years of the 21st century.

TRANSLATION TO HEALTH EDUCATION PRACTICE

How can health educators and other practitioners make use of these findings? First, practitioners engaged in contraception counseling must consider that persons may already hold strong feelings about some methods before they ever enter the educational or clinical setting. Although these feelings may arise from limited user experience and knowledge derived through a variety of sources, they also may be connotatively rich and emotionally laden, possibly interfering with effective practitioner-to-patient communication. Improved understanding



of the dimensions across which potential users judge contraception methods may be beneficial in fostering communication between potential users and practitioners who provide advice about various options. Noting these dimensions also may help break through persons' myths, misconceptions, and sentiments concerning particular contraceptive methods.

It may be unwise for practitioners to assume that students in this age cohort possess an extensive knowledge of the range of contraceptive options or the specific application of a particular method. Miller¹⁰ found that 74% of the undergraduate college students she surveyed had heard of emergency contraception (EC), but fewer than one-third knew its prescription status, user side effects, or its action mechanism. Just 16% knew that it was likely to be available at the college student health center.¹⁰

It is also important to be cognizant of health professionals' bias and any predisposition they may have toward being pejorative about a method, its use, or its potential users. Some authors have shown that preordinate attitudes about EC users were held by pharmacy students who in the future may play a critical role in the ability of women to obtain EC, either over-the-counter or by prescription.³² These same authors reported that pharmacy students expressed reluctance about dispensing EC.³² The effect of advisor bias, consumer bias, and the interaction of the two on eventual choice and use of a method is imaginably profound.

Other researchers examining condom packaging and accompanying instructions concluded that what appeared to be straightforward information about use might be confusing and actually contribute to negative attitudes that could affect adoption by potential users.³³ Steiner, Cates and Warner³⁴ conclude that misinformation about condoms contributes to distrust, and in turn, their nonuse.

In summary, unique combinations of knowledge and attitudes about contraception can affect consumer adoption and use. Ultimately, decisions about contraception can influence STI and pregnancy rates, as

well as other public health-related outcomes. Subtleties in how contraceptive technologies are evaluated by potential users should continue to be monitored so that persons in a position to educate, advise, or counsel can be equipped to be responsive to changing perceptions of norms and beliefs.

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