Sex Differences in Response to Marijuana in a Social Setting

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Due to the failure to include women in the subject samples of most experimental investigations of the effects of cannabis, the possibility exists that the data obtained on this social intoxicant are applicable to only 49% of the population Those few studies that have compared males and females have focused on performance variables and have demonstrated very few differences It was hypothesized that the most likely area for male/female marijuana differences would be that of social interactions and behaviors related to these interactions

In a relaxed, informal atmosphere, *E*s videotaped the social interactions of groups of female friends, female strangers, male friends, or male strangers as they smoked coltsfoot, placebo, and marijuana In addition to social-condition and drug-condition differences, we obtained statistically significant effects indicating that the women responded both to the social situations and to the drug differently from the men In general, the women interacted with each other more positively than did the men These effects were paralleled by sex differences in mood, person perception, and even in how pleasurable or annoying the experimental tasks were

These data are of import not only in the area of cannabis research but in the field of social interactions and the study of female/male differences as well

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INTRODUCTION

One of the most frequently ignored extrapharmacological variables in marijuana research is the sex of the experimental subject (*S*) Research endeavors in diverse areas (Chesler, 1972, Christenson & Swanson, 1974, Horner, 1976, Glazer-Malbin & Waehrer, 1972, Maccoby & Jacklin, 1974, Mednick & Tangri, 1972, Parlee, 1975, Vaughter, 1976) have pointed out the necessity of taking this variable into serious consideration

Sex differences in adaptive styles have been observed by Brannigan and Tolor (1971) and Garai (1970), in reviewing the literature on sex differences in mental health, makes a case for the existence of perceived differences between the sexes in emotional behavior, motivation, interests, need satisfaction, life goals, and social relations Behavioral sex differences have been observed in neonates (Korner, 1973) Not surprisingly, sex differences have also been noted in response to drugs Frankenhauser (1972), for example, has found equal doses of alcohol to result in more pronounced blood-alcohol values in females than in males Male and female patients have been found to respond differentially to a variety of drugs used in therapy—including placebos (Ban, 1972, Goldberg, 1972, Lipton, 1972) Even the laboratory rat is subject to sex differences in response to drugs (Cohn, Barratt, & Pirch, 1972, Russell, 1974)

Scientific investigation of the effects of marijuana in humans, however, has concentrated on how men react to or perform on the drug At the January 1976 New York Academy of Sciences Conference on Chronic Cannabis Use, information on the effects of this drug on women was conspicuous in its absence (Adamec, 1976) At that three-day conference women were only mentioned in three papers Carter and Doughty (1976) mentioned that in Costa Rica it is mostly men who smoke, and since they wanted to keep their number of variables down they did not look at any female cannabis users, Soviet (1976) mentioned that it is rare in Egypt for a woman to smoke marijuana and be incarcerated for it, so he did not look at women (it is not, however, rare in North America for a woman to use this drug), Perez-Reyes, Brine, and Wall (1976) did report on five women who used marijuana—they found that the rate and pattern of metabolism of a contraceptive was not affected by the women's cannabis use

It is not that women have never been used as *S*s in marijuana experiments. Females were included in the subject samples by Abel (1970, 1971a, 1971b, 1971c), Crancer, Dille, Delay, Wallace, and

Haykin (1969), Dittrich, Battig, and von Zeppelin (1973), Hansteen, Lonero, Miller, and Jones (1972), and Low, Klonoff, and Marcus (1973), but no cross-sex comparisons were made Klonoff (1973, 1974) and Klonoff, Low, and Marcus (1973) compared men and women but were unable to report any differences The only study to date that has reported sex differences in the effects of marijuana did not involve administration of the drug (Entin & Goldzung, 1973)

The concentration in the above studies has been on performance variables However, due to the very social nature of marijuana intoxication (Adamec, 1975) the findings that, in preparation for their adult social roles, males and females—even as neonates—are treated differently (Thoman, Leiderman, & Olsen, 1972), perhaps the most likely area for female/male marijuana differences would be that of social interactions and behaviors related to these interactions The present experiment therefore addressed itself to the question of whether men and women would respond differently to marijuana in a social situation

METHOD

Subjects

Potential *S*s volunteered for the study in response to advertisements on radio and in newspapers requesting people from all levels of drug experience to participate in a Canadian Government-sponsored marijuana experiment (characteristics of the first 236 volunteers are described in Adamec, Pihl and Leiter [1976])

As *S*s would be smoking in same-sex groups of friends or strangers, and as the composition of groups of friends could not be manipulated, the friends were selected first, and strangers were chosen to match the groups of friends on drug experience, age, and education

Females The four female friends and four female strangers ranged in age from 22 to 30 years (mean age = 24 75), with from zero to five years university (mean = 3 25) Five of the women were married or married equivalent They were engaged mainly in traditional female occupations occupational therapist (n = 1) nursing assistant (n = 1), elementary-school teacher (n = 1), student (n = 1), secretary (n = 4) The major form of recreation for these women was creative—dance, photography, art, music All were experienced marijuana users, having smoked on the average 7 75 times per month for an average of 4 75 years Two women had taken LSD 10 times, one had taken it once, and the remaining five had had no experience with acid

Males The four male friends and four male strangers ranged in age from 21 to 31 (mean = 22 years), with from zero to four years university (mean = 3) They were engaged in a variety of occupations business (n = 3), creative arts (n = 1), community work (n = 1), student (n = 2), research assistant (n = 1) All had been smoking marijuana for a minimum of two years (mean = 4) on an average of three times a week Six of the men had experienced LSD an average of 19 times

Environment

Experimentation was conducted at an outpatient rehabilitation center—a modern, colorful building that was closed at night, when all experimentation was scheduled Every attempt was made to create a warm, unsterile, relaxing, and informal atmosphere in the room where the *Ss* smoked The ceiling in the 14-by-20-foot "smoking room" was lowered to 8 feet by draping Indian bedspreads in a canopy effect Posters of nature scenes decorated the walls Illumination was low and indirect *Ss* sat on cushions on the carpeted floor They could light incense and a candle if they wished and were allowed to bring their own records, listen to the radio, or play guitar while they smoked As the people conducting research can contribute significantly to the atmosphere created, care was taken in the selection of the two female and two male experimenters (*Es*) to ensure that, in addition to being able to administer the tests, they would be able to accurately empathize with a stoned *S*

Drug

Experimental sessions were separated by a minimum of seven days to minimize contamination of the doses (Lemberger, Silberstein, Axelrod, & Kopin, 1970, Lemberger, Tamarkin, Axelrod, & Kopin, 1971) *Ss* smoked twice in an evening, the second smoking session beginning one hour after the start of the first This was done in an attempt to maintain *Ss* at a fairly stable level of intoxication throughout the testing and to further approximate a normal evening of smoking

All material was administered in the form of cigarettes (joints) of uniform size and weight first session of the evening 3250 gms, second session 2167 gms *Ss* were instructed to forcefully exhale air from their lungs for 4 seconds just prior to taking a toke (inhaling smoke), then to toke evenly, sucking in a little bit of air at the same time (5 seconds), drawing the smoke deep down into the lungs After toking they were to suck in a little more air (2 seconds), hold it in for 20 seconds and then rest for 25 more seconds *Ss* were asked to complete the rest period even if the joint was passed back to them before the 25 seconds were up A new joint could not be started until the previous one had been smoked completely—including the roach (butt)

High dose (M) The marijuana used in this experiment was provided by the Food and Drug Directorate of Canada It contained 1 5% Δ^9THC (Lot 2-PP-126) Thus, in the first smoking session of the evening *S*s could smoke 5 mg THC, and in the second smoking session 3 mg THC However, as sensitivity to marijuana appears to vary widely from person to person, and as marijuana users generally dose themselves subjectively (Pearl, Domino, & Rennick, 1973), *S*s were advised that they need not smoke all the marijuana provided, as we were interested in getting them comfortably stoned, not overdosing them

Low dose (P) Material for the "low" dose was in fact placebo material provided by the Food and Drug Directorate The placebo was fully extracted marijuana plants that, when smoked, smelled and tasted like marijuana Low-dose joints were of the same weight as high-dose joints

Baseline dose (C) In the first week (Week A), *S*s smoked joints of the same weight as low- and high-dose joints but containing coltsfoot—an herbal tobacco substitute available commercially

Procedure

All testing was conducted in the evening, as during previous experimentation (Adamec, 1971) *S*s had complained about having to smoke shortly after breakfast or in the early afternoon, when they were more accustomed to smoking at night

All *S*s were told that on the first evening they would be smoking coltsfoot and that the purpose of this session was to obtain baseline measures, to familiarize them with the tests and procedure, and to let them get acquainted with their *E* They were informed that 50% of the groups would smoke a low dose of marijuana in the second week and a high dose in the third week (CPM), while the rest of the groups would be given doses in the opposite order (CMP) *S*s were not given any information as to the order they had been assigned to or the goals of the experiment In fact, all *S*s were run in the following order Week A—coltsfoot, Week B—placebo, Week C—marijuana

To ensure the safety of the *S*s, they were driven home after the placebo and marijuana sessions, where they were to remain until the following day They were requested not to drink alcohol on a testing day and not to smoke marijuana or take any psychotropic drugs between experimental sessions, but were asked to have a meal before coming to the testing center In order to avoid the possible interference with mood and cooperativeness that nicotine withdrawal might have (Agué, 1973), and as no physiological measures were being taken, *S*s were allowed to smoke tobacco during the experimental sessions

When *S*s first arrived they chose a code name to preserve anonymity

They were then shown the testing rooms and smoking room, and the general procedure was explained to them They were informed that the smoking sessions would be videotaped but that the tapes would be scored and erased within a week to preserve confidentiality They were shown the location of the camera and microphone in the smoking room and the monitor and VTR controls several rooms away In Week A *S*s then signed a consent form indicating that they understood that their participation would involve the following (1) on about three occasions of three to four hours each they would smoke marijuana cigarettes that may contain up to 100 micrograms Δ^9THC, i e Δ^9THC/lb body weight, (2) they wouldtake a battery of psychological tests, the details of which had been explained to them, (3) they would be kept at either the testing site or medical facilities until all apparent effects of the drug were gone, (4) they would be given transportation home from the testing site and would remain home until the next day, and (5) in case of any adverse effects they would contact the first author

*S*s were told that an experimenter would be with them in the smoking room during the sessions to give them the joints as needed and to answer any procedural questions they might have The same female *E* served this function for all groups As it would have been very easy to manipulate the mood of the *S*s and the nature of their high, *E* did not initiate discussions but when addressed would encourage discussions initiated by the *S*s as well as reflect and positively reinforce all the attitudes, theories, and philosophies expressed by them

Tests

a) Graph *S*s indicated how stoned they felt on a graph similar to the High Graph used in the LeDain Commission experiments (Miller, Hansteen, Adamec, & Lehmann, 1972) However, the term "stoned" was used rather than "high" to eliminate previous confusion with the feeling of unintoxicated exhilaration A solid line at the bottom represented a point where *S*s would be when straight (unintoxicated) A dotted line 200 mm above the abscissa represented the most stoned they had ever been on marijuana outside the experiment The first point on the graph was plotted before smoking and represented how stoned *S* usually got when s/he smoked under natural conditions Six times during the evening (See Table 1), *S* rated how stoned s/he felt with respect to these three points—straight, usual stone, and stonedest ever As "usual stone" varies from *S* to *S*, the measure taken was the percent of usual stone rather than the absolute value

b) Mood Weil and Zinberg (1969), evaluating mood changes with a scale developed by Smith and Beecher (1959) to measure the effects of morphine, found that marijuana caused no consistent changes in mood in either chronic users or naive *S*s As there was some suggestion that this may have been due to the neutral laboratory setting, it was decided to use Smith

and Beecher's scale in this less neutral context This seven-point, self-rating, bipolar mood scale was administered each evening both before and after smoking Ss were told that the end points of the scales represented "extremely," the sixth and second positions represented "very," and the fifth and third positions "somewhat" or "a little," with the mid-point representing "half-way between the two extremes "

c) Person Perception To evaluate whether under experimental conditions perception of others would be altered by smoking with them, Ss filled out a person-perception questionnaire during postsession testing This test consisted of sets of 10 seven-point bipolar scales with the code name of the person to be described at the top of each set The scales were arranged in the following order warm-cold, insensitive-sensitive, friendly-distant, open-restrained, rejecting-accepting, peaceable-aggressive, dull-witty,

Table 1

Procedure

Pre-Session Testing	
	Consent Form (if Week A)
	Mood Scale (pre smoke)
	Instructions for Smoking and Graph
	Usual Stone (on Stonedness Graph)
Time	
00 00	1st smoking session videotaped (5 mg THC Week C)
00 30	Trial 1 Stonedness Graph
	Mood Scale (post-smoke)
	Memory task time production and distance and time perception tasks
00 59	Trial 2 Graph
01 00	2nd smoking session (3 mg THC Week C)
01 30	Trial 3 Stonedness Graph
	Perceptual tasks
02 05	Trial 4 Stonedness Graph
	Perceptual tasks
02 25	Rest Period (Personality Research Form, Week A)
Post-Session Testing	
03 10	Trial 5 Stonedness Graph
	High Questionnaire
	Person Perception Task
	Task Evaluation
03 30	Trial 6 Stonedness Graph
	Ss driven home (Weeks B & C)

unkind-kind, considerate-inconsiderate, a drag-good company *Ss* also evaluated themselves and the experimenter

d) Videotape Behavior was recorded with two Shibaden cameras and VTR deck and a Sony microphone suspended from the ceiling of the smoking room The cameras were in full view in the smoking room, but the monitor and controls were located in a separate room

Subjects were told that they were being videotaped the entire time In fact, for financial reasons, *Ss* were videotaped only during the second, fourth, and sixth five-minute segments of the first 30-minute smoking sessions of the evening Experimenters watched the second smoking session on the monitor but did not tape it

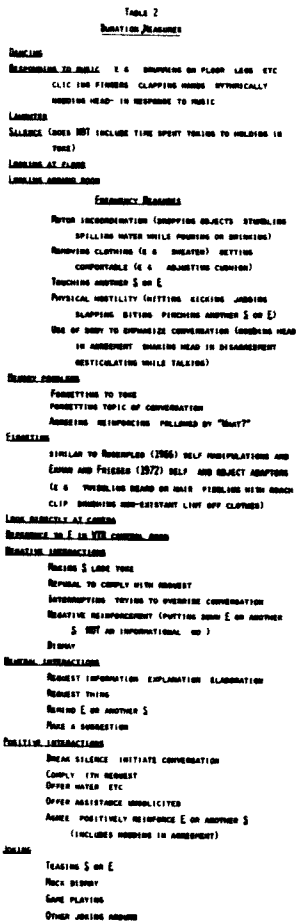
The guidelines for behavioral analysis were derived essentially from Bales (1950) While Bales's technique of interaction-process analysis usually focuses around a problem set and requires extensive training to achieve reliability, it was readily adapted to the present situation by operationally defining the scoring categories in a more objective fashion Pilot studies were conducted with *Ss* smoking alone and in groups to determine which behaviors were amenable to reliable quantification This also afforded the opportunity of selecting behaviors appropriate to this particular experimental setting, e g , inclusion of responding to music Only those behaviors for which consensus could be achieved were included in the scoring protocol The behaviors quantified are outlined in Table 2 VTR scores represent the summation of the three five-minute time samples

Six assistants were trained in the scoring of the videotapes (four males, two females) Scorers always quantified the same behaviors, e g , scorer A would time laughter and silence on every tape she scored, while scorer B always timed responding to music and talking to *E* in the room Raters were not informed of the social condition or drug condition of any session

e) Task Evaluation At the end of each evening *Ss* indicated how pleasurable or annoying each of the experimental tasks were on seven-point bipolar scales

f) Personality During the rest period in Week A (no drug), *Ss* completed the Personality Research Form (PRF, form AA, Jackson, 1969)

g) Perceptual and Performance Tasks As indicated in Table 1, a number of performance and perceptual tests were administered As the focus of this experiment is on sex differences in social behaviors in response to marijuana, these data will not be presented here Tables summarizing these analyses may be obtained from the first author It should be noted, however, that no sex differences, sex–by–drug or sex–by–social-condition interactions, were obtained on these variables



Statistical Procedures

Taking multiple measures on the same experimental subjects necessitated the use of specialized statistical procedures It would have been inappropriate to simply perform multiple *t* tests or even multiple univariate analyses of variance (ANOVAs) Consequently, multivariate analyses of variance for repeated measures (MANOVAs) were utilized (NYBMUL, Version 2, 1969) All MANOVAs were performed on the McGill University IBM computer Comparisons were made according to procedures outlined by Winer (1962), e g , conservative degrees of freedom, pooled error terms and pooled degrees of freedom, where appropriate Unless otherwise specified, all probabilities are for two-tailed tests Only statistically significant results are reported

RESULTS

Stonedness Graph

On both coltsfoot and placebo, differences between males and females on all six trials failed to reach statistical significance On marijuana, men reported feeling more stoned than women only on trials 2 ($p < 05$), 3 ($p < 01$), and 4 ($p < 01$)—i e , not for the period during which their behaviors were quantified On all trials, both men and women felt significantly more stoned on marijuana than on coltsfoot or placebo (all $p < 001$)

There were no statistically significant differences between friends and strangers on any of the six graph trials after the smoking of coltsfoot Friends, however, rated themselves as more stoned than did strangers on four of the placebo trials (T1, T2, and T4 $p < 01$, T3 $p < 001$) and five of the marijuana trials (T1 $p < 05$, T2 and T4 $p < 01$, T5 and T6 $p < 001$) For both strangers and friends, the smoking of marijuana produced statistically greater feelings of stonedness than both placebo and coltsfoot on all six trials (friends all $p < 001$, strangers $1p < 05$, $2p < 01$, all remaining $p < 001$) Within the groups of friends, the placebo effect (P > C) did not disappear until the initiation of post-session testing (T5), while within the groups of strangers the placebo effect was nonsignificant by T4

Mood

There were no statistically significant drug effects or drug interactions for any of the mood variables There were, however, significant sex effects ($F = 3\ 8554$, $df\ 6,75$, $p < 0021$), social condition effects ($F = 6\ 6173$, $df\ 6,75$, $p < 0001$), and social condition x sex interactions ($F = 2\ 9970$, $df\ 6,75$, $p < 0112$) Friends, regardless of sex, reported feeling more awake than strangers ($p < 0418$), safer ($p < 0002$), happier ($p < 0130$), more good-natured ($p < 0024$), more confident ($p < 0007$), calmer ($p < 0029$), warmer toward people ($p < 0001$), and less worried ($p < 0002$) They also felt the situation to be more real ($p < 0002$) The women, regardless of social condition, felt happier ($p < 0006$), more good-natured ($p < 0008$), and warmer toward people ($p < 0001$) than did the men The male strangers felt the least safe and least calm of all the participants in the study

Person Perception

The smoking of placebo and marijuana did not alter how *S*s viewed themselves or others Women and men, however, evaluated people very differently All 10 variables on perception of the *E*s were statistically significant Females always rated *E*s more positively than males ($8p < 001$, $2p < 01$) Similarly, in self perception women rated themselves more positively than did the men on all 10 variables ($6p < 001$, $3p < 01$, $1p < 03$) Friends considered themselves better company than did the strangers ($p < 03$) and evaluated each other as more friendly ($p < 0106$), open ($p < 0023$), peaceable ($p < 0328$), witty ($p < 0041$), and better company ($p < 0002$) than did strangers In sharp contrast to the popular opinion that women are harsher on each other than are men, the women rated each other more positively than did the men on all 10 person perception variables (all $p < 0001$, see Figure 1)

Task Evaluation

The strangers found the person-perception task less pleasurable than the friends ($p < 0168$)

The women enjoyed the social aspects of the experiment more than the males did (e g , second smoking session $p < 002$), but found evaluating each other or being evaluated by each other less pleasurable than did the men ($p < 0026$) The women, like the strangers, found the person-perception task unpleasant ($\bar{X} < 4$)

The smoking of placebo and marijuana did not affect the pleasurable or annoying qualities of any of the tasks in the experiment

Social Interactions

Men and women responded socially to the experimental situation and to the drug administration with very different behaviors Not only did females perceive each other more positively than did males (person perception, above), they interacted with each other more positively Furthermore, female friends and female strangers did not differ statistically on any of the quantified social behaviors, whereas male friends and strangers did differ on a number of behaviors The sex–by–social condition–by–drug interactions reflected the general unease of male strangers on placebo and marijuana

Irrespective of drug or social condition, women were silent less than men ($p < 0371$), were more positively reinforcing of each other

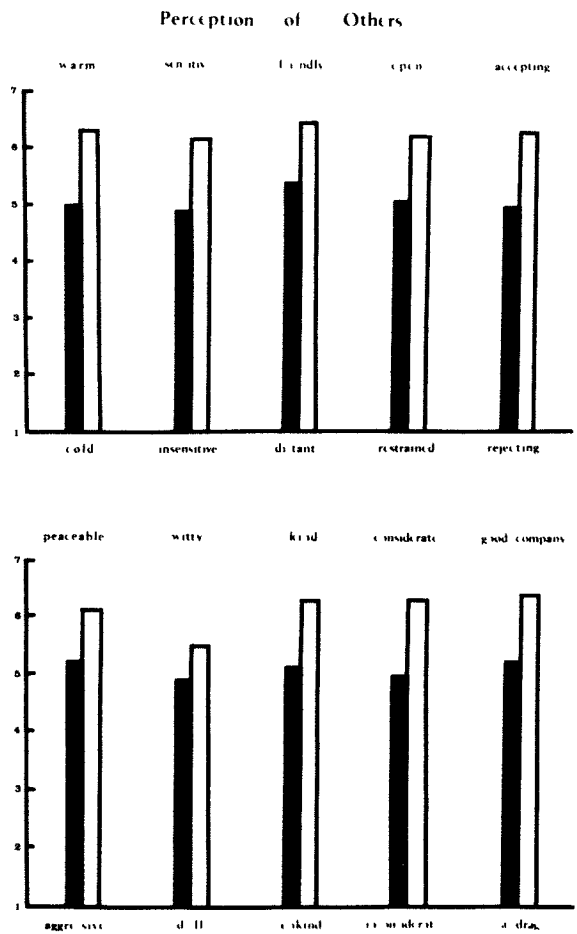


FIGURE 1 Perception of others sex effects
males (filled) females (unfilled)

than were men ($p < 0016$), and made greater use of body movements to emphasize conversation ($p < 0001$, see Figure 2) Regardless of social condition, males and females laughed equally on coltsfoot and placebo, but women showed a greater increase in laughter on marijuana than did men ($p < 0012$, see Figure 3) A different pattern was observed for frequency of positive interactions Males and females did not differ on marijuana, but on coltsfoot and placebo women had a greater number of positive interactions than men ($p < 01$ and 001, respectively, Figure 3) Drug effects on joking

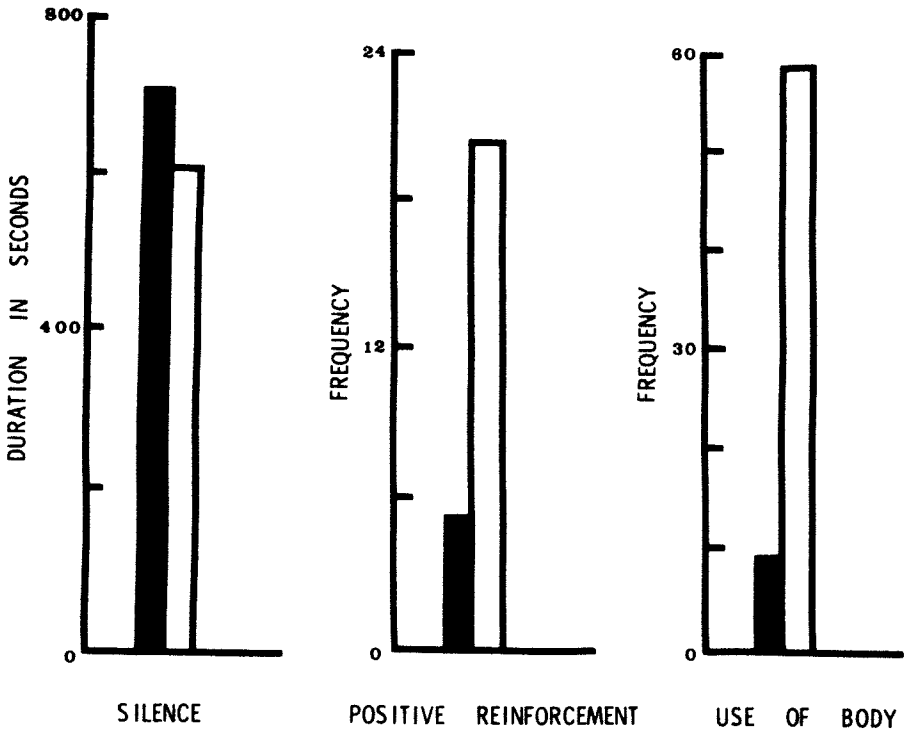


FIGURE 2 Social interactions sex effects
Silence (duration), Giving positive reinforcement to others (frequency), Use of body to emphasize conversation (frequency)
males (filled) females (unfilled)
Note that the scale onthe ordinates differs for the three behaviors

yielded yet another pattern Drug administration did not significantly affect male joking Furthermore, men and women did not differ in joking frequency on coltsfoot or placebo, but on marijuana women joked more than men ($p < 01$, Figure 3)

Two of the sex–by–social condition–by–drug interactions were of particular interest Female strangers fidgeted less than male strangers on coltsfoot and placebo ($p < 02$ and 001, respectively), and in all three drug conditions they spent less time looking at the floor (coltsfoot $p < 05$, placebo $p < 05$, marijuana $p < .001$, see Figure 4) However, there were no statistically significant drug effects in fidgeting or looking at the floor for male friends, female friends, or female strangers

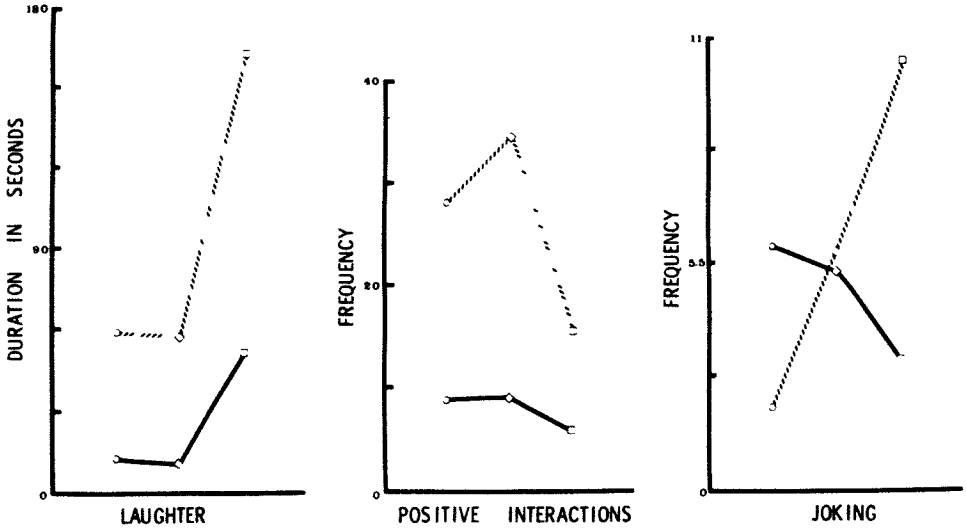


FIGURE 3 Social interactions drug × sex interactions
Laughter (duration), Positive interactions (frequency), Joking (frequency)
○ coltsfoot ◇ placebo □ marihuana
women men
Note that the scale on the ordinates differs for the three behaviors

DISCUSSION

The drug histories of *Ss* in the present study can be considered highly unusual if compared to the *S* samples in marijuana experiments In an attempt to discover pure marijuana effects uncontaminated by experience with other drugs, investigators typically select *Ss* with little drug experience (Abel, 1971a, Bech, Rafaelsen, & Rafaelsen, 1973, Darley, Tinklenberg, Hollister, & Atkinson, 1973, Miller, Drew, & Kiplinger, 1972) or with no reported nonlegal drug experience at all (Clark, Hughes, & Nakashima, 1970, Clark & Nakashima, 1968, Dittrich & Woggon-Steiner, 1972) However, the drug histories were not at all unusual in terms of the general population of marijuana users (LeDain Commission, Appendix C, 1973), nor were they unusual in terms of the population of women and men who volunteer for a marijuana experiment (Adamec et al , 1976)

In addition to and in interaction with the social setting manipulations and drug manipulations, the sex of the *Ss* influenced the course

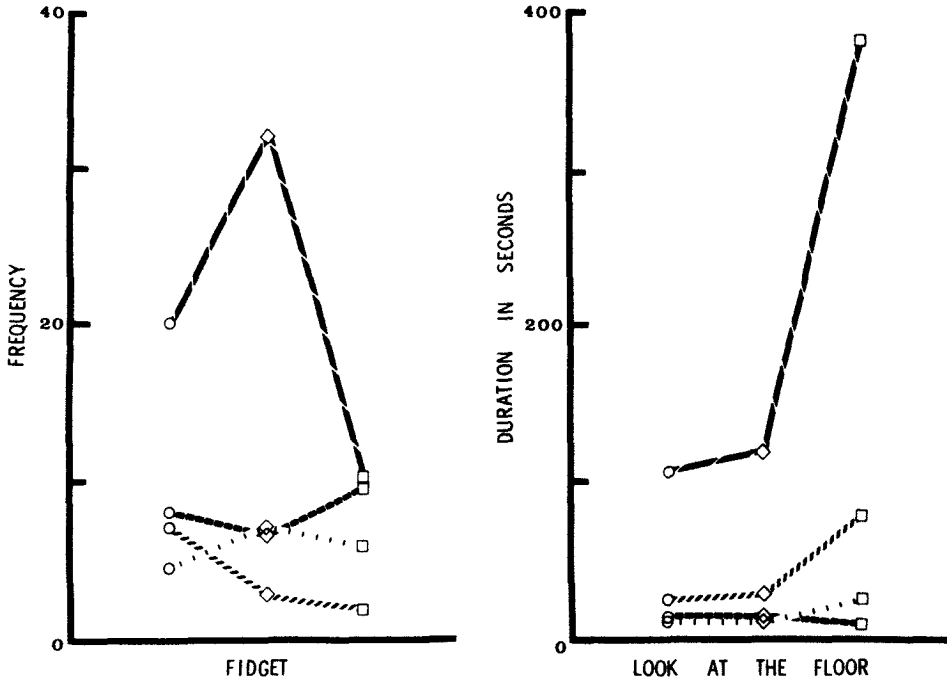


FIGURE 4 Social interactions drug × sex × social condition interactions
Fidget (frequency), Look at the floor (duration)
○ coltsfoot ◇ placebo □ marijuana
female friends male friends
female strangers male strangers
Note that the scale on the ordinates differs for the two behaviors

of events The women reacted to the experimental situation very differently from the men They perceived each other, themselves, and the experimenters more positively, they were in more positive moods, and found the experiment on the whole more pleasurable than did the men Their verbal reports of subjective states were so internally consistent that one would be led to suspect a positive response bias in the women on paper-and-pencil tests However, their overt behaviors corresponded with their verbal reports Not only did they perceive each other more positively, they interacted with each other more positively

Rosenfeld (1966), in a role-playing situation where *S*s were asked to elicit different degrees of liking, found higher speech rates,

lengthier communications, frequent verbal reinforcers to the addressee, gesticulation, smiling, and positive head nods to be associated with the attempt to elicit liking The women exhibited all of these behaviors to a greater extent than the men The men did not dispense positive reinforcement particularly liberally and made very little use of their body to emphasize conversation In this context, it should be noted that the more frequent expressive use of the body by the women was not merely a function of their being silent less

The differences between the sexes were most noticeable in the responses of the strangers The male strangers felt less safe, less calm, and less good-natured than the other *S*s They did a tremendous amount of fidgeting—especially on the placebo—and looked everywhere but at each other—especially on marijuana These differences were also reflected in the topics discussed during the smoking sessions While these data were not quantified and consequently could not be subjected to statistical analyses, they do provide a taste of the dynamics of the situation The men talked about mechanical and impersonal topics and frequently addressed questions to *E* The women, on the other hand, rarely addressed *E* Rather than avoiding each other, they turned the smoking sessions into encounter or consciousness-raising sessions They discussed in depth women and relationships in society in general, as well as their own very personal experiences The atmosphere was one of self-exploration and support

It was not entirely unexpected that men and women would respond differently to this social situation Mehrabian (1971) has reported that standing communicators are more relaxed with females than with male addressees, and that seated female communicators are more immediate (proxemic) than male communicators Using confederates in a waiting-room experiment, he found that with same-sexed targets females affiliated more than males and were more intimate and submissive Our results, except for submission (which we did not observe), concur with those of Mehrabian Also in a waiting-room experiment, Coutts and Schneider (1975) found that more glances occurred in female dyads than in either male or mixed-sex dyads The VTR equipment available did not permit scoring of glances, mutual or otherwise, in the present experiment The *E*s in the control room, however, frequently commented that they were impressed by the visual behavior and facial expressions of the female strangers, specifically the degree to which these behaviors appeared to communicate unconditional positive regard and empathy—particularly when a women would be revealing something very per-

sonal These are unquantified impressions and must be evaluated as such They are mentioned because they provide a clue for further promising research

Buck, Miller, and Caul (1974), in a completely different context, found females to be more accurate "senders" (communicators of affect via facial expression) than males If, as the *E*s in the present experiment believed, the female strangers were sending messages of positive regard and empathy, and if, as Buck et al have found, they would be more accurate in communicating these attitudes to others than would males, then the openness of our women could, at least in part, be ascribed to these communications

If the only statistically significant effects obtained had been sex effects, or sex-by-social-condition interactions, then the data would have been of interest in and of themselves However, the six sex-by-drug and sex-by-social condition-by-drug interactions obtained (laughter, total positive interactions, joking, looking at the floor, fidgeting, and talking to *E*) indicated that not only did men and women differ in their response to the experimental situation, but their spontaneously emitted (as opposed to performance) behaviors were differentially affected by the drug condition as well

The nature of these differences is particularly interesting Marijuana resulted in a facilitation of positive social responses in the male friends The male strangers showed the converse of this facilitation The women, however, showed an accentuation of an already higher level of positive behaviors Moreover, social condition appeared to be irrelevant among the women The female strangers responded to each other positively at the outset There was not the same "stranger response" in the women They were outgoing, communicative, and supportive The nature of the female strangers' interactions did change on marijuana—they did not continue to explore the very personal topics initiated in the first four smoking sessions Rather than withdrawing from social contact as the male strangers did, the women changed the contact from serious, positive encounters to more playful but still positive interactions

We are not here predicting that exactly the same results would be obtained with different *S*s sampled from a different population Behaviors expressing warmth are frequently seen as prescribed for women and proscribed for men (Phillips & Segal, 1969) The women in the present study were engaged in traditional female occupations They did exhibit behaviors associated with traditional female roles (e g , "giving") However, the women also appeared nontraditional in several respects The one outstanding characteristic of their per-

sonality scores was that the highest scale for each and every woman in the sample was Autonomy In the course of the smoking-sessions-cum-consciousness-raising-sessions the female strangers discussed their feelings about smoking with women they didn't know They volunteered (to each other, i e , they were not prompted or prodded by *E*) that they could not have participated in this study a few years earlier They claimed that they would have felt threatened and competitive and would have been very much preoccupied with "sizing each other up" and therefore would probably have dropped out of the experiment after the first session The speculation here is that had the degree of "liberation" of these women been measured they would have scored high We would not expect women low on "liberation" to react to this situation in the same open way that our sample of women did By the same token, however, we would expect "liberated" males to resemble, behaviorally, the women who participated in this experiment

These data reflect sex differences in social responsiveness that influence how men and women respond to the social drug cannabis and are therefore important in terms of the generalizability of marijuana studies conducted only on men

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