

INVOLVEMENT LEVEL AND OTHER DETERMINANTS  
OF POINT ALLOCATION IN THE SPAN  
DECISION MAKING TECHNIQUE

by

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## ABSTRACT

The present study focused on the effects of issue ambiguity and personal involvement in the pattern of point allocations in the SPAN (Social Participatory Allocative Network) decision making technique, which utilizes a power sharing concept. The liberal-conservative quality of the SPAN outcomes was compared with results of direct voting, for male and female groups. Results were in keeping with the experimental predictions. The more ambiguous issue produced a more conservative group vote and a larger proportion of points given to other group members. SPAN yielded more liberal group votes than the direct vote method, and females voted more conservatively than males. In addition, SPAN voters allocated power to group members perceived as having attitudes similar to their own. Although the experimental manipulation of involvement level did not result in significant effects, an independent questionnaire measuring involvement was strongly associated with the proportion of power sharing and with the number of people to whom voting points were given. Implications for the utility of SPAN in future decision making were discussed.

## INTRODUCTION

One of the most salient characteristics of present-day Western society is the swift current of change which invades people's lives. Technical change has risen exponentially in the last three centuries, with the rate of major change rising by a factor of 10. More specifically, the period in which change must be assimilated has decreased from nearly a century to less than a decade (Watson and Johnson, 1972). This unprecedented rate of change has created demands on institutional and individual levels which men in the past have not had to meet. Indeed, social systems are not keeping pace with technological innovation. The result is that man is more often finding himself unprepared for the overwhelming novelty and change which render his previously adaptive behavioral routines ineffective.

The term "social lag" has been used in reference to the failure of institutional adaptation to keep pace with technological advances (Ogburn, 1922). Similarly, Toffler (1970) coined the term "future shock" to describe the stress and disorientation induced in individuals by subjecting them to a large amount of change in a relatively short period of time. Addressing himself to the need for a balance between rates of change in different sectors of society, Toffler called special attention to the need for a balance between the pace of environmental change and the pace of human response. His main concern was that man's

lack of control over the rate and direction of change may result in a massive human adaptational breakdown.

With respect to the process of change, a critical factor over which man has control is the making of decisions about the future. The quickening tempo of change and the newness of circumstances alter the very nature of the decisions which man makes, forcing him to decide on novel issues which have profound effects on society at large. Decision makers are pressured to find quickly the solutions to a wider variety of problems. However, there exists a conflict between the pressures of acceleration and those of novelty, for one forces man to make faster decisions, while the other compels him to make complex, time-consuming decisions. This "decision stress" (Toffler, 1970) is intensified by the expanding diversity in the issues and a corresponding increase in the number of alternative decisions from which an individual can choose. Increasing the number and kinds of issues also increases the amount of information a person must process in order to effectively deal with them. This steady increase in the number of factors to be studied and the information to be processed interferes with the ability of each individual to make qualitatively good decisions. Indeed, laboratory tests have shown that a larger number of choices results in slower reaction times (Toffler, 1970). Despite this finding, there seems to be a more urgent demand for rapid and creative solutions to increasingly complicated problems.

In response to this urgency and in an effort to shorten the lag between technological changes and social adaptation to these changes,

the current trend is toward minimal diagnostic study and faster application of possible remedial strategies (Watson and Johnson, 1972). Although studies have indicated that the movement from a need to a practical remedy is more rapid than it was previously (Miles, 1964), change programs are sometimes initiated with insufficient knowledge about pertinent causal factors (Watson and Johnson, 1972). The shortcomings of this approach are reflected in the frequently disappointing results of such programs. One possible solution to the conflicting needs for urgent action plans and well thought out decisions based on accurate information may lie in the use of versatile decision making methods. For instance, training a wide variety of people in the use of effective decision making techniques may decrease the "social lag" by promoting immediate solutions to problems which might otherwise be delayed by referral to upper levels of authority (Watson and Johnson, 1972). Related to this is the suggestion that analysis of decision making methods' suitability for specific types of issues may alleviate the growing lag between the appearance and solution of major social problems. This may be especially beneficial to groups that are frequently confronted with several contradictory proposals or competing candidates (Edelstein and Warner, 1972).

The greater novelty, complexity, and diversity of problem issues calls for a decision making process which allows flexibility and creativity in arriving at progressive solutions. Considering the larger amount of information to be processed, the efficiency and effectiveness of decision making could be improved by proportional

utilization of the resources of all group members. One method of decision making which meets the criteria of flexibility, creativity, and optimal input from group members is the Social Participatory Allocative Network (SPAN) technique developed by MacKinnon (1966; MacKinnon and MacKinnon, 1968). SPAN encourages optimal use of the voter's power by enabling him to choose an option or candidate as well as allowing him to relinquish a portion of his decision making power to others who may be better qualified or more capable of making a particular decision. The user of SPAN divides his voting power (total number of points) between two categories: the available options and the other group members. The "group members" category is referred to as "representatives," and the "available solutions" category is referred to as "options." Following this initial division of power, the individual allocates points to specific representatives and specific options. The final SPAN outcome is the result of computerized cyclic computations in which all points pass from the representatives to the options category. While the initial computer program required that individual power parcels of 100 points to be divided between representatives and options, subsequent revision of this program (MacKinnon and Cockrum, 1973) makes it possible to use an arbitrary number of points. A prospectus for incorporating confidence weighting in the SPAN method was written (MacKinnon, 1974) and the most recent revision of the computer program allows for both confidence weighting of selected options and the processing of SPAN data for as many as fifty groups on a single run (Anderson, 1975; MacKinnon and Anderson, 1976).

The flexibility inherent in the SPAN procedure and the efficiency of computerized results make SPAN a potential contender for upgrading the quality of decisions and accelerating the decision making process. There is evidence that the quality of group decisions generated by the SPAN process surpasses the quality of decisions resulting from more common methods, particularly the majority rule method. Studies have shown that SPAN is capable of improving the quality of group decisions generated by existing decision making techniques (Hitchcock, 1967; Willis, 1966). Comparing the SPAN outcome with the results of two other decision making procedures, Willis (1966) reported that SPAN produced solutions which were weighted significantly more accurately than was the case with comparative techniques. The main difference between the comparative methods and SPAN was that the other methods permitted subjects to vote only for potential solutions, whereas SPAN permitted direct (e.g., options category) and indirect (e.g., representatives category) allocations. An experimental endeavor by Willis, Hitchcock, and MacKinnon (1969) indicated that SPAN was superior to the direct method of voting, that the representational route surpassed the direct route, and that subjects would have upgraded their performance by allocating more points via the indirect route. It was also found that subjects reported greater satisfaction with SPAN as a possible way of selecting good solutions.

In the context of the quality of group decisions, a relevant point of inquiry is the conservative-liberal dimension of the final group vote. Reporting on the "risky shift" phenomenon, which indicates

that group decisions tend to be more risky than individual decisions, Wallach and Kogan (1964) attributed group riskiness to the diffusion of responsibility. According to them, a person's awareness that decisions are being made jointly with other people decreases feelings of personal responsibility for the consequences of the decision. This decrease in individual responsibility facilitates risk taking, making it easier for a person to gamble on options which may have a higher probability of failure. Diffusion of responsibility thus promotes riskier choices because no individual can be blamed for potentially unsuccessful results of the group decision. From the standpoint that allocation of voting power to other group members diffuses personal responsibility, the SPAN process may be expected to yield more liberal decisions than other decision making methods which do not permit indirect allocation of voting power. Although the liberal or conservative quality of decisions does not necessarily hold implications for the effectiveness of the resolution, liberal outcomes may promote more flexibility and creativity in the change process.

In addition to influencing the quality of group decisions, the SPAN technique permits pliability in choosing options, allowing voters to allocate points to more than one option and to other group members. This is particularly relevant in light of the increasingly multifaceted nature of problem issues. Instead of making a definite choice on the basis of little knowledge, a person is encouraged to allocate points proportionally to preferred options and to group members who may be better informed about the topic at hand. A member's power to determine

group performance depends largely on his demonstrated competence, since group members tend to award control to those who are perceived as more able (Burnstein and Katz, 1972). Ideally, group decision making should weight the contribution of more skillful members more heavily than the contributions of less skillful members.

While SPAN encourages optimal use of personal resources, it would be erroneous to assume that voting power is given to other participants solely on the basis of their perceived competence. One interpersonal variable which may have a potent effect on point allocation to other people is the perceived similarity between an individual's attitudinal position and the positions of other group members. On the basis of scientific evidence, it may be expected that a SPAN voter will allocate points to participants with attitudes that are perceived as similar to his own. Byrne and Nelson (1965) suggested that people are attracted to those who support and generally reinforce their life style, explaining that a higher rate of reinforcement is associated with higher similarity. Furthermore, they reported that persons similar in attitudes and socioeconomic status tend to be more attracted to each other, a finding which may also be explained by reinforcement theory.

The relationship between similarity and attraction may be understood in the context of cognitive dissonance theory, which states that people strive to maintain consistency in their views of themselves, their environment, and their relations with other persons (Festinger, 1957). Given that an individual attempts to establish internal harmony among his attitudes, knowledge, values, and interpersonal relations, it

follows that a person would be more attracted and more likely to interact with people having similar values, attitudes, etc. While the reinforcement and cognitive dissonance approaches stem from different origins, they are not mutually exclusive paradigms. In the context of either theory or both theories, one may expect SPAN group members to be attracted to people perceived as similar to themselves and to allocate voting power to similar members more frequently than to those perceived as dissimilar.

The effects of attitudes on decision making tend to become more powerful when dealing with increasingly ambiguous or confusing issues. It has been reported that when other internal anchors, such as knowledge of factors, cannot be used in making a decision, one's attitudinal position can determine the outcome (Sherif and Hovland, 1961). Ambiguity also intensifies the effects of other people's attitudes on personal choices. Research findings indicate that individuals are more readily affected by the perceptions of others under conditions of ambiguity. The well-known experiments by Sherif (1935) and Asch (1951) demonstrated that, without objective standards by which to judge stimulus materials, subjects' judgments were greatly influenced by the erroneous perceptions of other people judging the same stimuli. In keeping with this, additional studies have shown that an ambiguous setting causes people to depend on others for modeling cues (Schachter and Singer, 1962; Weil, Tinberg, and Nelson, 1968). Considering that ambiguity tends to promote reliance on other people for guidance and

feedback about correct responses, SPAN's emphasis on power sharing is particularly applicable to novel, complicated, or confusing issues.

Another variable which affects interpersonal perceptions and decision making, especially under ambiguous conditions, is the degree of personal involvement in the issue at hand. While participation in the SPAN process automatically involves voters in the pertinent issues, there are individual differences in the levels of interest and emotional involvement in the issues. These differences may affect the voting process and corresponding outcome. Dawes, MacPhillamy, and Singer (1971) found that more highly involved subjects tended to misperceive the attitudinal positions of others, exaggerating the differences between their own attitudes and those of other people. With regard to the SPAN technique, a highly involved person is likely to exaggerate the discrepancies between his own attitudinal position and those of other group members. As a result, he may be less willing than an uninvolved person to allocate voting power to other group members.

On the basis of the preceding evidence, it appears that making group decisions about ambiguous issues is largely influenced by attitudinal position, perceived similarity of other participants, and personal involvement level. The SPAN method, with its direct (i.e., options) and indirect (i.e., representatives) routes of point allocation, seems to be well suited for voting on controversial topics and choosing among conflicting alternatives. The present study utilized the SPAN technique, focusing on the effects of issue ambiguity and personal involvement level on the pattern of point allocations. The

liberal-conservative quality of the SPAN outcome was compared with results of direct voting, for male and female groups. The following predictions were made:

1. The more ambiguous issue should result in a more conservative group vote and in a larger proportion of points given to other group members.
2. Highly involved subjects should allocate less points to fewer group members than subjects who are less involved.
3. SPAN should produce more liberal group votes than the direct vote method.
4. SPAN voters should allocate points to group members perceived as most similar to themselves.
5. Considering that females are socialized in a more conservative, conforming fashion than males (Barry, Bacon, and Child, 1957; Bardwick, 1971), female votes should be less liberal than male votes.

## METHOD

### Design and Experimental Manipulations

The study was conceptualized as a 2 x 2 x 2 design: high-low ambiguity x high-low involvement level x male-female voting responses. Ambiguity was manipulated by presenting two different issues: the unrestricted use of alcohol (low ambiguity) or marijuana (high ambiguity) on The University of Arizona campus. While the use of either drug on campus may be considered somewhat controversial and ambiguous, the marijuana issue is more ambiguous because of the related diversity of opinions which are not substantiated by clear, irrefutable evidence. On the contrary, scientific investigations of the effects of marijuana have yielded contradictory, confusing results.

To manipulate involvement level, the experimenter varied the subjects' expectations about the consequences of their votes. In the high involvement condition the subjects were informed that their results would be given careful consideration by the dean of students. It was stressed that the dean was interested in receiving student feedback, which could in turn effect a change in university policies regarding the issues. In the low involvement condition the experimenter explained that the subjects' participation in the experiment would result in scientific data about human decision making processes but that the results would not affect university regulations.

Because the experimental manipulation of involvement tapped only one aspect of this variable, a questionnaire was used as an additional, more general index of involvement. This was done in accordance with the suggestion by Dawes et al. (1971) that involvement level would be more accurately assessed by including an independent measure of involvement which is broader and more sensitive than an experimental manipulation. The questionnaire is reproduced in Appendix D. In summary, this questionnaire required that an individual assess the frequency of each of two behaviors: the consumption of alcoholic beverages and the smoking of marijuana. The subject was also asked how he would feel if he were prevented from indulging in the behaviors and to what degree the behavior is dysfunctional. One item asked the subject to directly estimate his level of involvement with each drug. The major part of this survey was modeled after a questionnaire used by Ijams (1972) in a study of variables associated with dysfunctional behavior dependence.

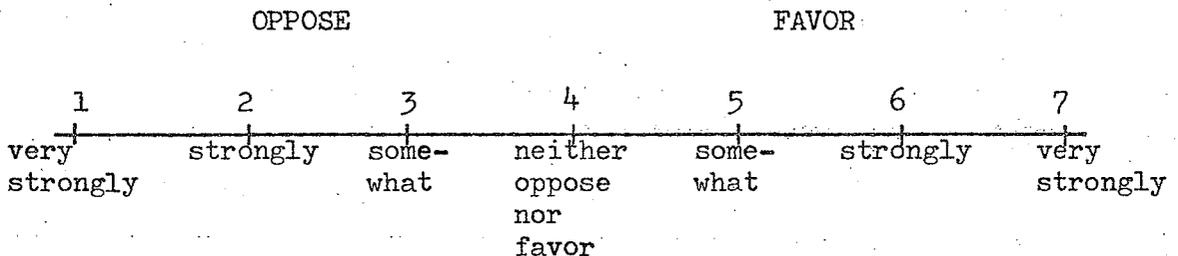
#### Subjects

Twenty-four groups, twelve male and twelve female, voluntarily participated in the experiment. Each group consisted of seven people living in the same dormitory. Subjects were sufficiently familiar with one another to stimulate a short group discussion about the experimental issues with relative ease.

Procedure

The subjects were told that they were to participate in a study of group decision making utilizing a new voting method. Following an explanation of the SPAN procedure, subjects were informed, according to the involvement condition, that their group's vote would serve as feedback for the dean of students or that the vote would only be used for scientific purposes. The experimenter's presentation of the issues and involvement conditions are reproduced in Appendix B. The issues of alcohol consumption and marijuana smoking were presented separately, with the order of presentation randomly varied among groups. Each presentation consisted of a statement of the issue and university regulations prohibiting the use of the drug, followed by a five-minute group discussion on the following:

The present university regulations concerning the consumption of alcohol (or smoking of marijuana) should be abandoned, entitling students to the unrestricted use of alcohol (or marijuana) on this campus.



Immediately after the discussion, subjects were asked to indicate which group member's attitudinal position was most similar to their own. They were then asked to vote according to the SPAN procedure. The voting instructions and voting sheet are reproduced in Appendix A and

Appendix C. Due to the nature of the above options, subjects were told to allocate points to only one option but to give voting power to as many group members as they desired. The presentation, discussion, and voting were repeated for the second issue. Upon completion of the decision making for both topics, subjects answered the involvement questionnaire.

## RESULTS AND DISCUSSION

An analysis of variance was performed for each of the following dependent measures: SPAN group results, direct vote results (e.g., group means of the seven option numbers chosen by the members (individually), group differences between SPAN and direct vote results, and the number of points allocated to representatives in the SPAN process. These analyses are summarized in the appropriate tables, with corresponding values of  $\underline{w}^2$  for significant sources (Hays, 1963). Where significant interaction effects were indicated, cell means were compared using Tukey's Honestly Significant Difference (H.S.D.) method (Runyon and Haber, 1972).

### SPAN Results

Cell means of the SPAN group votes are presented in Table 1. Each cell contains the average of groups' outcomes along the liberal-conservative attitudinal dimension. In general, SPAN means were liberal, with the grand mean (6.0) situated one point below the most liberal position on the scale. The analysis of variance, summarized in Table 2, yielded significant main effects for the issue ( $p < .001$ ) and sex ( $p < .025$ ) variables, as well as a significant sex x issue interaction ( $p < .001$ ). SPAN decisions about alcohol were more liberal than decisions about marijuana by approximately one scale point. Males tended to make more liberal decisions than females, even though the average difference between sexes was less than one scale point. The

Table 1. Cell means: SPAN results.

Sex and Involvement Level	Issue		
	Alcohol	Marijuana	
Males			
High Involvement	6.500	6.000	6.292
Low Involvement	6.500	6.167	
Females			
High Involvement	6.667	4.667	5.708
Low Involvement	6.500	5.000	
	6.542	5.458	6.000

Table 2. Analysis of variance summary table: SPAN results.

Source	SS	df	MS	F	$\eta^2$
Topic (T)	14.083	1	14.083	54.516 <sup>b</sup>	.343
Involvement (I)	.083	1	.083	<1	
Sex (X)	4.083	1	4.083	7.538 <sup>a</sup>	.087
T x I	.333	1	.333	1.290	
T x X	5.333	1	5.333	20.645 <sup>b</sup>	.126
I x X	.000	1	.000	<1	
T x I x X	.083	1	.083	<1	
Error S(IX)	10.833	20	.542		
S(IX)T	5.166	20	.258		

<sup>a</sup>  $p < .025$

<sup>b</sup>  $p < .001$

sex x issue interaction, graphed in Figure 1, reveals that both sexes voted liberally on the alcohol issue but that females were considerably more conservative than males on the marijuana issue. The Tukey H.S.D. obtained three significant sets of differences between the following cells: Alcohol-Male and Marijuana-Female, Marijuana-Male and Marijuana-Female, Alcohol-Female and Marijuana-Female (Tukey H.S.D.,  $p < .01$ ). Thus, the interaction can be summarized by stating that females voting on the marijuana issue were more conservative than subjects voting in the other three conditions.

Results were in keeping with the predictions that the more ambiguous issue (marijuana) would prompt a more conservative decision than the less ambiguous topic (alcohol), and that females would vote less liberally than males. Although these effects are statistically significant, they do not represent large discrepancies in attitudinal positions. Of the two sources, the issue variable was the most powerful, accounting for 34.3% of the variance and a difference of roughly one scale point between topics. With the exception of the mild positions of females deciding about marijuana, groups tended to make liberal choices on the attitudinal scale, with relatively small differences between conditions. One reason for the similarity in attitudes across issues is that the use of marijuana is becoming more consistently acceptable among college students. The relatively small difference in attitudes between sexes may be explained by current social trends toward sex role fusion, diminishing the differences between male and female attitudes.

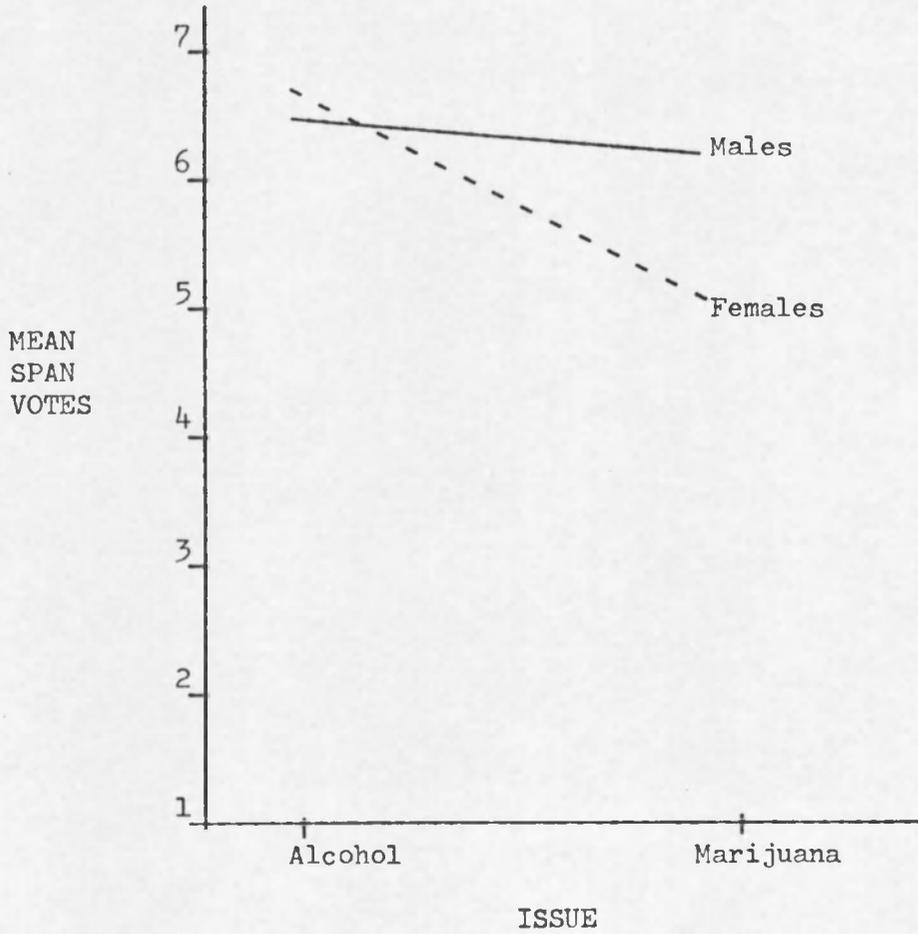


Figure 1. The sex x issue interaction for SPAN group results.

Direct Vote

The direct vote results were obtained by computing the mean of options directly chosen by subjects in the utilization of the SPAN procedure. Table 3 shows the mean direct vote outcome for each experimental condition. Group decisions were generally more liberal than conservative, with a grand mean of 5.744, falling just below the "strongly favor" position. The analysis of variance, summarized in Table 4, produced effects similar to the SPAN analysis. The issue and sex variables contributed significant main effects ( $p < .001$ ,  $p < .001$ ) and a significant sex x issue interaction ( $p < .001$ ). Subjects selected a more liberal attitudinal position when dealing with the topic of alcohol than when dealing with marijuana. Male voters were inclined to be more liberal than female voters. The sex x issue interaction, illustrated in Figure 2, indicates that males demonstrated liberal attitudes about both issues, while females showed more conservative attitudes toward the marijuana issue than the alcohol issue. Thus, both sexes chose liberal positions about alcohol, but females were more conservative than males about marijuana. Four comparisons resulted in significant differences between cell means, with the Alcohol-Male condition exhibiting more liberal decisions than the Marijuana-Female and Marijuana-Male conditions, the Marijuana-Male condition more liberal than the Marijuana-Female condition, and the Alcohol-Female cell more liberal than the Marijuana-Female cell (Tukey H.S.D.,  $p < .01$ ).

Direct vote outcomes were in accordance with the expectations that the more ambiguous issue would produce more conservative choices

Table 3. Cell means: direct vote.

Sex and Involvement Level	Issue		
	Alcohol	Marijuana	
Males			
High Involvement	6.143	5.833	6.006
Low Involvement	6.190	5.857	
Females			
High Involvement	6.071	4.810	5.482
Low Involvement	5.952	5.095	
	6.089	5.399	5.744

Table 4. Analysis of variance summary table: direct vote.

Source	SS	df	MS	F	$\underline{W}^2$
Topic (T)	40.048	1	40.948	134.623 <sup>a</sup>	.098
Involvement (I)	.298	1	.298	<1	
Sex (X)	23.048	1	23.048	13.665 <sup>a</sup>	.053
T x I	.762	1	.762	2.561	
T x X	11.440	1	11.440	38.459 <sup>a</sup>	.028
I x X	.048	1	.048	<1	
T x I x X	.964	1	.964	3.242	
Error S(IX)	276.595	164	1.687		
S(IX)T	48.786	164	.297		

<sup>a</sup>  $p < .001$

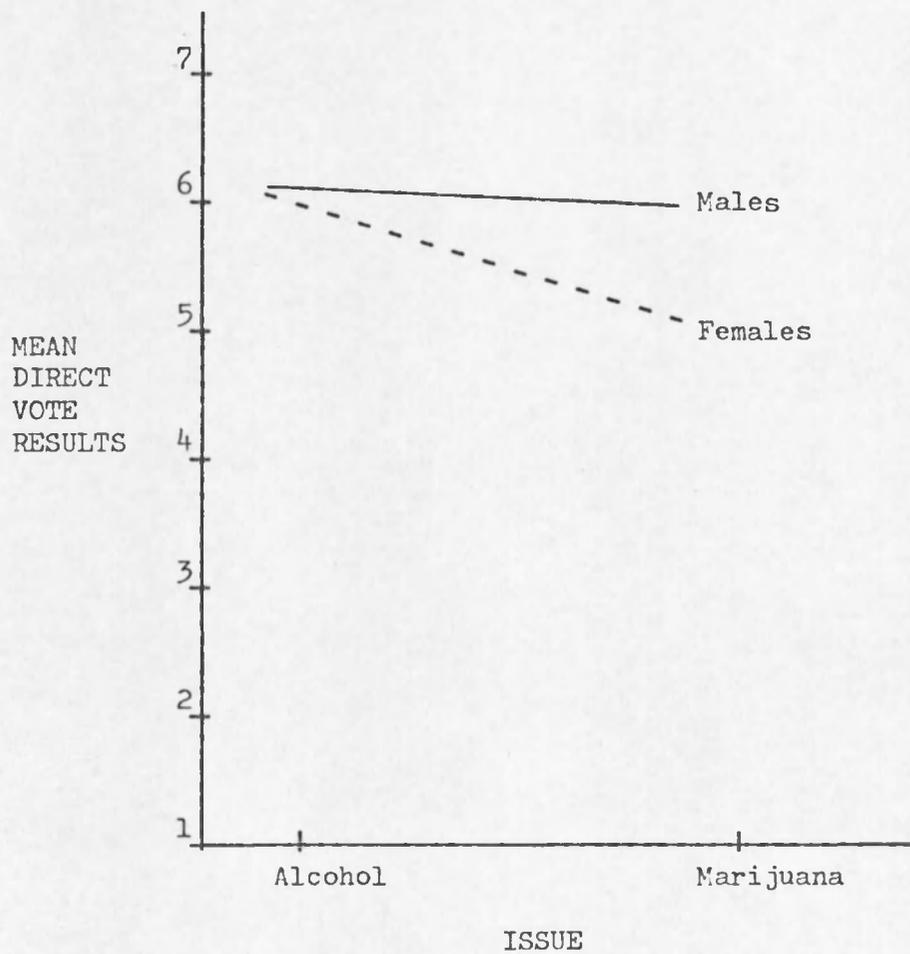


Figure 2. The sex x issue interaction for direct vote results.

and that females would select more conservative positions than males. However, these differences were small, averaging less than one scale point between means. The largest difference between cells stemmed from the interaction effect, manifesting a discrepancy of 1.2 scale points between the Marijuana-Female and Alcohol-Male conditions. Comparable to the SPAN results, groups indicated relatively liberal attitudes, with the most conservative cell mean reflecting a mild, "somewhat favor" position. The generally liberal attitudes may be attributed to the increasing acceptability of marijuana and to the decreased emphasis on female conservatism as a necessarily feminine, socially desirable trait.

#### Differences between SPAN and Direct Vote

Scanning the tables and graphs that apply to the SPAN and direct vote outcomes, it is evident that these decision-making methods produced similar patterns of results. Both sets of data reveal that the more ambiguous issue evoked more conservative attitudes, that females were slightly less liberal than males, and that the Female-Marijuana vote was more conservative than the Female-Alcohol, Male-Alcohol, and Male-Marijuana votes. Overall comparison of the data indicate that the direct vote was slightly less liberal than SPAN, as reflected in the grand means of 5.744 and 6.000, respectively.

In order to more accurately assess the differences between the decision making methods, an analysis of variance was performed on the differences obtained by subtracting the direct vote results from the

SPAN results. The mean differences for all experimental conditions are presented in Table 5. Positive cell means signify a more liberal SPAN vote than direct vote; negative means represent a more liberal direct vote than SPAN vote. Most of the cell means are positive, denoting the tendency for SPAN to render relatively liberal decisions. The purpose of the analysis of variance, summarized in Table 6, was to ascertain whether the differences in voting techniques varied systematically according to experimental conditions. The analysis revealed that the issue had a significant effect on the differences between voting methods ( $p < .001$ ). Although the SPAN decision was more liberal than the direct vote decision for both issues, there was a greater difference in this direction for the alcohol issue than for the marijuana issue. In other words, the type of voting method made more of a difference when voting on alcohol than when voting on marijuana. There was also a significant sex x issue interaction ( $p < .05$ ), illustrated in Figure 3. This graph demonstrates the tendency for SPAN to yield more liberal outcomes than the direct vote method, for all experimental conditions except the Female-Marijuana condition, in which the direct vote was slightly more liberal than the SPAN decision. The Tukey H.S.D. detected a significant difference between the Alcohol-Female and Marijuana-Female cell means ( $p < .01$ ).

With the exception of the Marijuana-Female condition, a comparison of the two decision making techniques supported the prediction that the SPAN method would obtain more liberal votes than the direct vote. However, this difference is not large, averaging less than one

Table 5. Cell means: differences between SPAN and direct vote.

Sex and Involvement Level	Issue		
	Alcohol	Marijuana	
Males			
High Involvement	.380	.143	.303
Low Involvement	.380	.310	
Females			
High Involvement	.667	-.142	.273
Low Involvement	.542	-.100	
	.493	.053	.273

Table 6. Analysis of variance summary table: differences between SPAN and direct vote.

Source	SS	df	MS	F	$\underline{W}^2$
Topic (T)	2.328	1	2.328	11.040 <sup>b</sup>	.150
Involvement (I)	.006	1	.006	<1	
Sex (S)	.044	1	.044	<1	
T x I	.081	1	.081	<1	
T x X	.989	1	.989	4.691 <sup>a</sup>	.101
I x X	.045	1	.045	<1	
T x I x X	.000	1	.000	<1	
Error S(IX)	6.161	20	.308		
S(IX)T	4.217	20	.211		

<sup>a</sup> p < .05

<sup>b</sup> p < .005

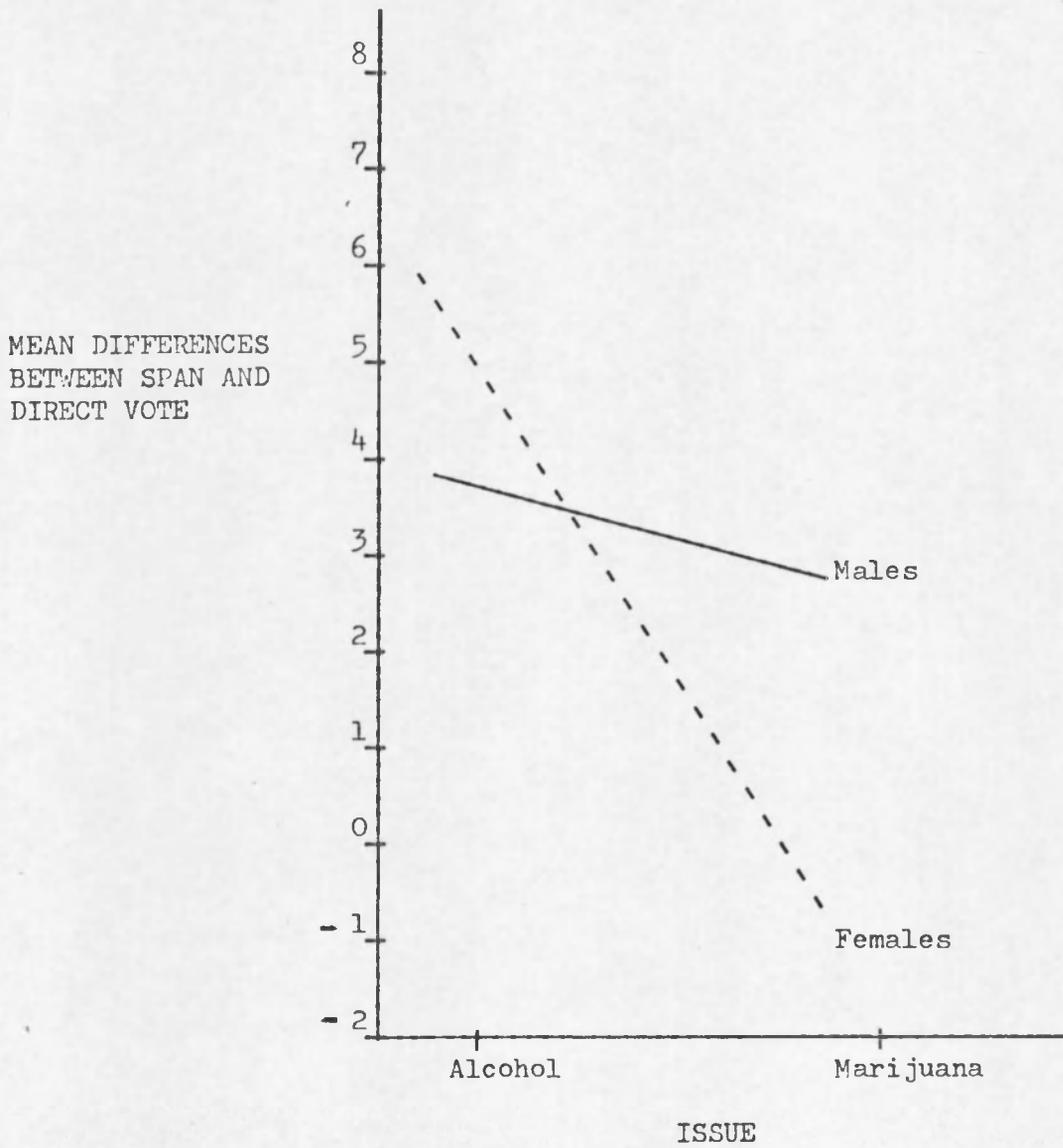


Figure 3. The sex x issue interaction for SPAN and direct vote differences.

scale point for all cells. In light of this, it should be pointed out that, while the type of voting method had a significantly greater effect on the alcohol outcome than on the marijuana outcome, it made only a slight difference of roughly half a scale point. In order for SPAN to produce slightly more liberal outcomes than the direct vote, individual voters tended to allocate points to people with attitudes which were slightly more liberal than their own. In keeping with the literature on similarity and attraction (Byrne and Nelson, 1965) subjects gave voting power to those whose attitudes were similar or only slightly discrepant (in the liberal direction, on the average) from their own attitudes. Although the Marijuana-Female condition contributed SPAN results in the opposite (conservative) attitudinal direction, the data demonstrate that subjects in this condition also tended to give power to people with attitudes only slightly different from their own. In this condition, the difference between the direct vote and SPAN vote was sufficiently small (difference = .121) to be overlooked for practical purposes. Thus, the type of decision method did not significantly affect the outcome of females voting on marijuana.

#### Points Allocated to Group Members

Mean number of points allocated to other group members using the SPAN technique are reported in Table 7. The grand mean (25.887) shows that, in general, subjects gave approximately one-fourth of their total voting power (100 points) to other people. According to the analysis of variance, summarized in Table 8, issue and sex contributed significant main effects ( $p < .001$ ), and sex x issue ( $p < .001$ ) and

Table 7. Cell means: points allocated to representatives.

Sex and Involvement Level	Issue		
	Alcohol	Marijuana	
Males			
High Involvement	21.905	25.833	23.333
Low Involvement	21.548	24.048	
Females			
High Involvement	24.119	34.286	28.440
Low Involvement	24.405	30.952	
	22.994	28.780	25.887

Table 8. Analysis of variance summary table: points allocated to representatives.

Source	SS	df	MS	F	$\underline{W}^2$
Topic (T)	2811.857	1	2811.357	135.203 <sup>b</sup>	.087
Involvement (I)	141.440	1	141.440	1.018	
Sex (X)	2190.964	1	2190.964	15.776 <sup>b</sup>	.064
T x I	133.762	1	133.762	6.432 <sup>a</sup>	.004
T x X	555.429	1	555.429	26.707 <sup>b</sup>	.017
I x X	4.298	1	4.298	<1	
T x I x X	25.190	1	25.190	1.211	
Error S(IX)	22776.000	164	138.878		
S(IX)T	3410.762	164	20.797		

<sup>a</sup>  $p < .025$

<sup>b</sup>  $p < .001$

issue x involvement ( $p < .025$ ) interactions were also obtained. Subjects allocated more points to the representatives category when voting on the marijuana issue than the alcohol issue, and females gave away more voting power than males. The sex x issue interaction, represented in Figure 4, shows that males were relatively consistent across issues in the amount of power given away but that females gave away more power when deciding on the marijuana issue than when deciding on the alcohol issue. Except for the difference between the Marijuana-Male and Alcohol-Female conditions, each cell mean was significantly different from each other cell mean (Tukey H.S.D.,  $p < .01$ ). The interaction of issue x involvement is illustrated in Figure 5. While subjects in high and low involvement conditions gave roughly the same number of points to other people when voting on alcohol, low involvement subjects gave away less points than high involvement subjects when voting on marijuana. With the exception of the Alcohol-Low Involvement and Alcohol-High Involvement conditions, all cell means were significantly different from each other.

The fact that subjects allocated more points to representatives when voting on marijuana than when voting on alcohol is in accordance with the expectation that the more ambiguous issue would prompt voters to give away more power than the less ambiguous issue. Although the involvement manipulation did not yield significant main effects, the small difference between involvement condition means (differences = 1.298 scale points) was in the direction of more power given away under conditions of low involvement. On the other hand, the issue x

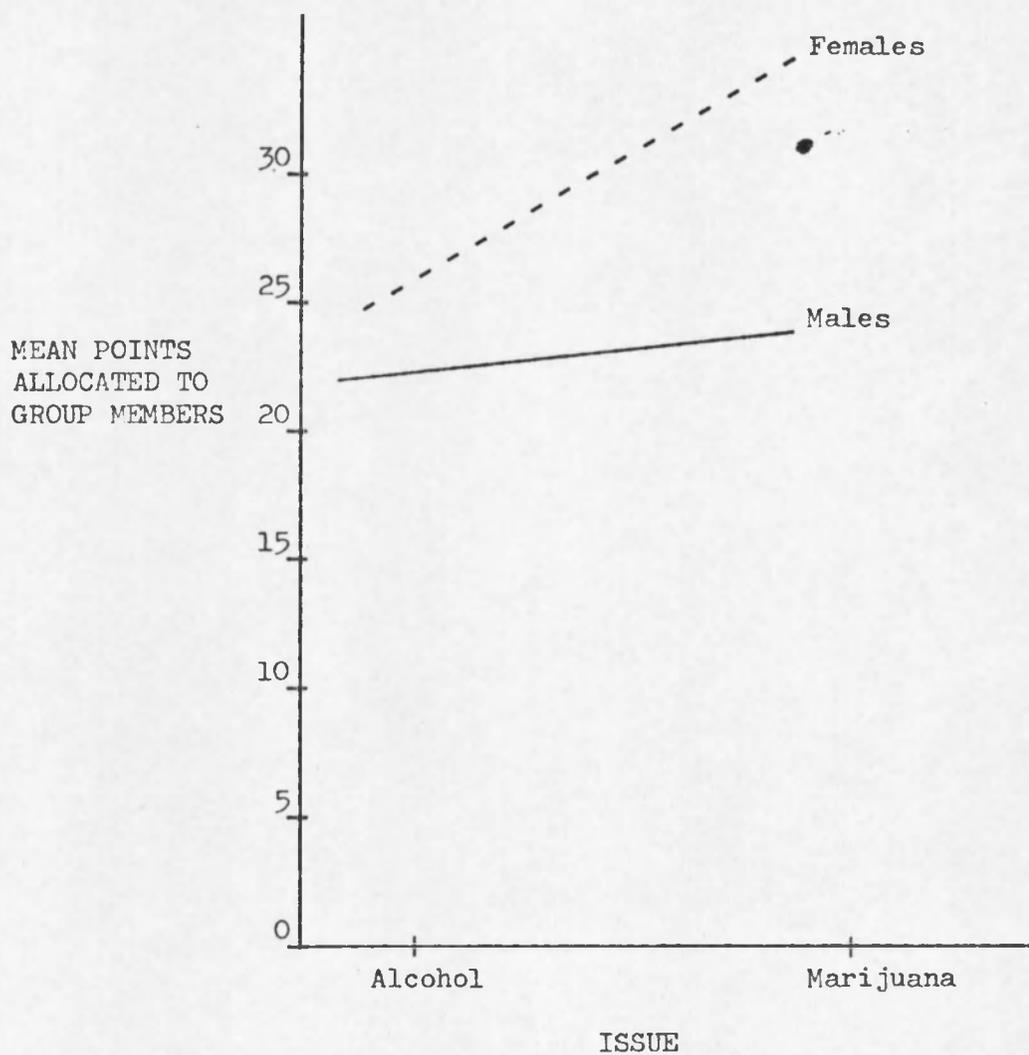


Figure 4. The sex x issue interaction for points given to other group members.

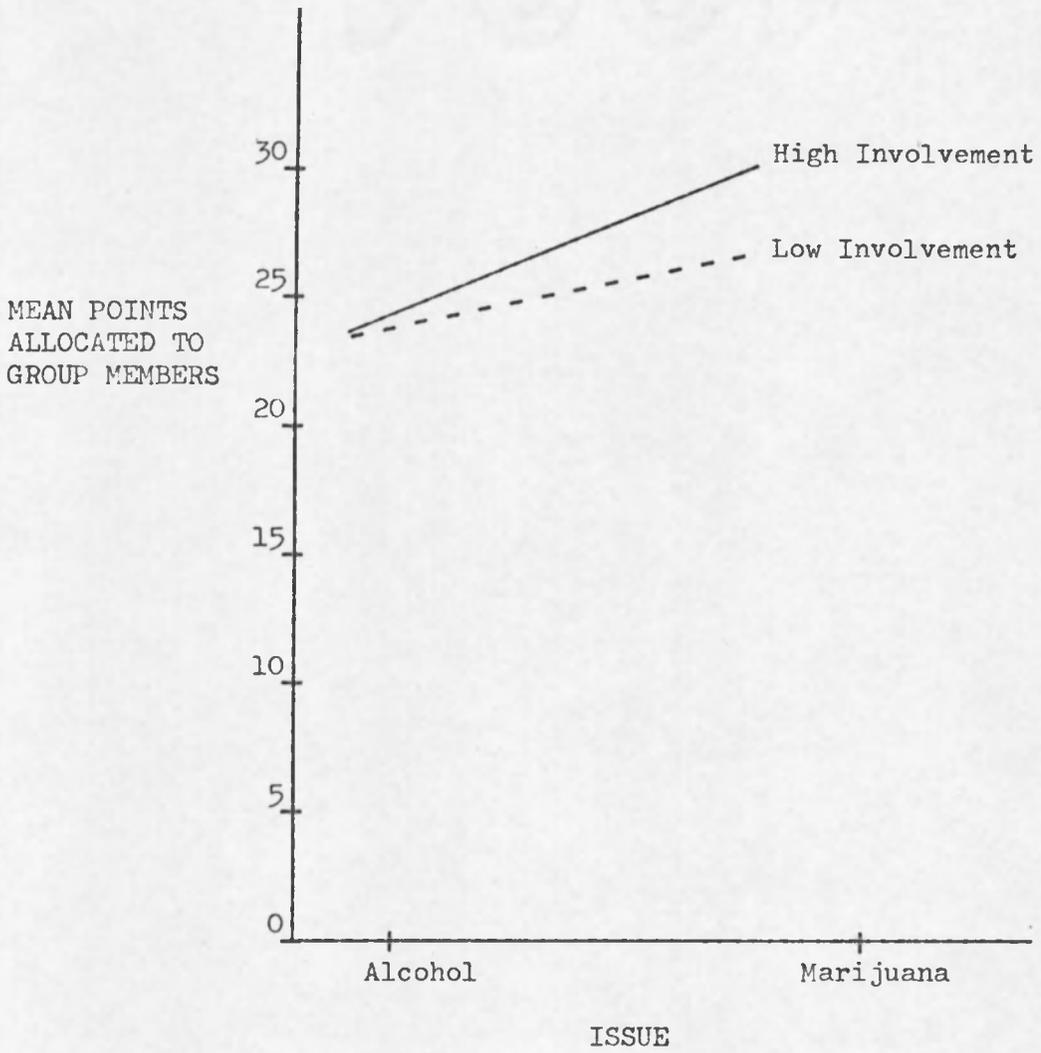


Figure 5. The issue x involvement interaction for points given to other group members.

involvement interaction demonstrated a reversed trend for the marijuana issue, with subjects giving away more points in the condition of high involvement rather than low involvement. There is no apparent explanation for this finding. One possibility, however, is that low involvement subjects were less interested in the issue and less motivated to expend energy (e.g., by allocating points to other members) than highly involved subjects. This explanation does not seem too likely, however, in light of the fact that the same result was absent in the alcohol conditions. Overall, the experimental manipulation of involvement level appears to be weak, producing no powerful effects.

Although no specific predictions were made about the differential effects of sex on the number of points allocated to other people, the fact that females gave away more voting power than males is consistent with research suggesting that females are more dependent and more easily influenced by interpersonal factors than are males (Bardwick, 1971). The sex x issue interaction, indicating that females were more likely than males to give other people a larger number of points when voting on marijuana than alcohol, is compatible with females' tendency to make more conservative decisions about marijuana than alcohol. Both of these findings may be associated with the more ambiguous, indefinite nature of the marijuana issue and the relative uncertainty which this causes, particularly in females.

#### Questionnaire Measure of Involvement

The involvement questionnaires were scored for separate measures of involvement in alcohol and involvement in marijuana. Possible

scores for each issue ranged from 0 to 16, with the higher number reflecting the highest degree of involvement. Scores ranged from 4 to 15, with a mean score of 10 for the alcohol issue and a mean of 9 for the marijuana issue. Thus, the average involvement score fell in the midrange of possible scores for both issues.

In order to examine the relationship between a multifaceted measure of involvement and the pattern of point allocation in SPAN, the involvement questionnaire scores were correlated with the number of points allocated to other group members and with the number of people to whom voting points were given. A strong negative association was found between the questionnaire scores and the number of points given to other group members ( $r = -.833$ ,  $p < .001$ ). This correlation suggests that the more highly involved a person was in an issue, the fewer the number of points he was likely to give to other participants. Unlike the experimental manipulation of involvement level, which failed to produce a main effect and yielded only a limited interaction effect, the scaled score index of involvement was strongly related to the amount of voting power which an individual was willing to give away.

In keeping with the above results, the questionnaire score correlated negatively with the number of people to whom individuals gave voting power ( $r = .74$ ,  $p < .001$ ). This indicates that the higher a person's involvement level, the fewer the number of people to whom he was willing to allocate voting points. Summarizing both correlations, it appears that the more highly involved the subjects were, the less amount of voting power they gave away, to fewer group members. This

implies that the more involved a person is in the issue at hand, the less willing he is to allow other people to make relevant decisions for him. These correlations are in accordance with the expectation that highly involved people would allocate less points, to fewer group members, than subjects who are less involved in the issue. Comparing these results with the experimental manipulation of involvement level, it appears that the experimental manipulation was a weak one, focusing on one narrow aspect of involvement, whereas the questionnaire tapped several pertinent aspects of involvement.

#### Perceived Similarity of Group Members

Examining the patterns of point allocation from a slightly different perspective, a chi-square was performed on the frequency with which male and female subjects allocated voting power to the person whom they chose as having attitudes most similar to their own. This statistic is summarized in Table 9, which reveals that 98.2% of the females gave points to the person perceived as most similar, and 100% of the males allocated power to the individual designated as most similar to themselves ( $\chi^2 = 6.0$ ;  $df = 1$ ;  $p < .05$ ). While the difference between sexes is extremely small, it may suggest a tendency for males to entrust others with power only when those people are perceived to hold similar values or attitudes, whereas females may be a little more flexible about giving power to people who are not necessarily like themselves. For practical purposes, however, the results reflect a general tendency for both sexes to give power to people whom they view

Table 9. Chi-square analysis: number of people giving points to person perceived as most similar.

Points Given to Most Similar Participant	Male	Female	
Yes	168 (100%)	165 (98.2%)	333 (99.1%)
No	0	3 (1.8%)	3 (.9%)
	168	168	336

$$\chi^2 = 6.0; df = 1; p < .05$$

as holding attitudinal positions similar to their own. This is consistent with the prediction that SPAN voters would allocate points to group members perceived as most similar to themselves.

Number of People to Whom Points  
Were Allocated

The data revealed that the number of people to whom a subject gave voting points ranged from one to four. A chi-square, reported in Table 10, focused on male and female patterns of point allocations to the representatives category ( $\chi^2 = 35.12$ ;  $df = 3$ ;  $p < .001$ ). Most males (54.8%) gave voting power to only one other group member, and a substantial proportion of males (42.9%) allocated points to two other participants. The majority of females (51.2%) gave points to two other people, and they allocated power to one person (24.4%) and three people (20.8%) in approximately equal proportions, but they very rarely gave points to four people (3.6%).

These findings may be summarized accordingly. The range of people to whom voting points were given was one to four for females and one to three for males. Most males gave points to only one person; most females gave power to two people. A substantial proportion of females allocated points to more than two people and never allocated power to more than three people. Overall, females were willing to give voting power to more people than males, who were most likely to share their power parcels with only one other group member. This is compatible with previously mentioned findings that females are more

Table 10. Chi-square analysis: number of people to whom points were allocated.

	Number of People Given Points				
	1	2	3	4	
Males	92 (54.8%)	72 (42.9%)	4 (2.3%)	0	168 (100%)
Females	41 (24.4%)	86 (51.2%)	35 (20.8%)	6 (3.6%)	168 (100%)
	133	158	39	6	336

$$\chi^2 = 35.12; \text{ kf} = 3; \underline{p} < .001$$

interpersonally dependent than males for cues and guidelines about the appropriateness of their responses, while self-reliance is more typical of males than females (Barry et al., 1957; Bardwick, 1971).

## SUMMARY AND CONCLUSIONS

Overall results were in accordance with the experimental predictions. The issue and sex variables most frequently produced significant findings, influencing the voting outcomes and pattern of point allocations. For both voting methods, group decisions about marijuana (the more ambiguous issue) were less liberal than decisions about alcohol, and females' votes were less liberal than males'. The sex x issue interactions indicated that, while males and females made liberal decisions about alcohol, females were inclined to be more conservative than males about marijuana. Although both decision making techniques rendered similar results, the SPAN method encouraged more liberal outcomes for all conditions except the Marijuana-Female condition.

The differential effects noted above were significant but small. For instance, the ambiguous issue and female votes yielded group decisions which were more liberal by one scale point, on the average. In a comparable manner, SPAN votes were only slightly more liberal, also by less than one scale point, than direct votes. The fact that these differences were not larger may be explained by the idea that the more frequent use and greater acceptability of marijuana among college students renders it a less ambiguous issue than it has been in the past, and that current social trends toward sex role fusion may dilute male-female differences in attitudes about alcohol and marijuana.

Issue and sex also affected the pattern of SPAN's point allocations. Voters allocated more points to other group members when voting on the more ambiguous issue, and females gave more voting power than males to other members. A sex x issue interaction revealed that females were more likely than males to give other people more voting power when voting on marijuana than alcohol. This reliance on other people when dealing with the more ambiguous issue is compatible with the finding that females made more conservative decisions than males about the marijuana issue, suggesting that marijuana may be a topic which induced more uncertainty in females. Together, these findings serve as evidence for the contention that females are more interpersonally dependent than males in decision making situations.

From a slightly different perspective, it was found that an individual voter usually allocated points to the person whose attitudinal position was perceived to be closest to his own. This is consistent with the fact that SPAN results were only slightly more liberal indicating that subjects gave voting power to people who were similar to themselves or slightly more liberal than they were.

With regard to the involvement manipulation, it was not sufficiently powerful to produce significant effects. However, the involvement questionnaire correlated negatively with the number of points allocated to other participants and with the number of people to whom points were given. This suggests that more involved people were less willing to share their decision making power, in the sense that they shared less points and gave power to fewer people.

On a practical level, considering the increasing complexity and ambiguity of social problems and the resulting uncertainty which encourages reliance on others for finding solutions, the SPAN technique may be particularly useful in future decision making. The demonstrated effects of involvement in a particular issue also suggest that SPAN may be the decision making method of choice in arriving at objective decisions which will be optimally effective. Assessing the use of the SPAN technique further, it is important to note that voters were willing to share their power with other people. SPAN users were likely to give points to people with the same or slightly more liberal positions, rendering the SPAN votes slightly more liberal than direct votes. Assuming that liberal decisions are the key to social change, this holds implications for the use of SPAN in future decision making. SPAN's emphasis on the use of direct and indirect power allocation allows for greater flexibility and creativity in the change process. Because SPAN makes efficient use of proportional input from group members, it may be increasingly applicable to the novel, complex, and ambiguous issues about which mankind must make decisions. The flexibility inherent in the SPAN procedure and the efficiency of computerized results make SPAN a potential contender for upgrading the quality of decisions and shortening the lag between the appearance and solution of social problems.

## APPENDIX A

### INSTRUCTIONS FOR USING SPAN\*

This is an exercise in group decision making. You will use the SPAN method of decision making, which allows you to share your voting power with other members of the group if you desire to do so. Each member of the group has an equal amount of voting power which, when combined with the voting power of all other group members, will determine the group decision about the issue at hand.

This process of decision making involves three steps. In step one, you decide what percentage of power, or voting points, you wish to give to the other group members and what percentage you wish to keep for yourself. You then write these two percentages on their respective lines on the answer sheet. Remember that the percentages of power you share and keep must sum to 100%, or 100 points.

In step two, you specify how much of your shared power you want particular individuals to receive. Decide to which individuals you are going to give voting power, and distribute among them the amount of power that you gave away to other members in general in step I-A. You may want to give some members more power than others, or you may want to distribute the power equally among the members to whom you give power. Please indicate how many voting points you are giving to each member by placing the number of points on the line next to the member's

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\*As adapted from the dissertation of Gilmartin, 1974.

identification number. After distributing power to other members, add up these points and make sure the total equals the number of points you gave to other members in step I-A.

In the third step, you choose one of the seven options which are listed at the top of the voting sheet and write the number of the option you choose on the last line of the voting sheet.

Are there any questions?

## APPENDIX B

### EXPERIMENTER'S PRESENTATION OF THE ISSUES AND INVOLVEMENT CONDITIONS

The issue which you will discuss and vote on has to do with the use of alcohol (or marijuana) on the University of Arizona campus. As most of you probably know, university regulations prohibit the possession or use of alcohol (or marijuana) on this campus. Your group vote on this issue will reflect how you feel about alcohol (or marijuana) on campus, and your vote will be presented to the dean of students, because he is interested in receiving student feedback, which might influence future changes in this particular regulation. (For the Low Involvement condition, subjects were told: "Your group vote will serve as useful scientific data about group decision making, but will not affect current university regulations about this issue.")

At this time, I would like you to refer to the handout and discuss the statement and accompanying options. Your discussion will last for five minutes. After five minutes, I will ask you to end the discussion and vote according to the SPAN procedure which I just described.



APPENDIX D

INVOLVEMENT QUESTIONNAIRE

This questionnaire requires careful reading. You are asked to examine your feelings and your experience, as best you can, in relation to two behaviors: drinking alcoholic beverages and smoking marijuana. The instructions must be applied to each behavior in turn. Remember that no one will know who you are from this form, so try to give a true picture of yourself. In certain cases, it may be helpful to read the instructions again when you are not sure. Please take your time and answer carefully.

- I. In terms of your present life situation, please indicate how involved or concerned you feel about the following issues. A person can be involved or concerned even though he has not taken any direct action on the matter or the issue.

	<u>Best Approximation of Current Involvement or Concern</u>					Place number of answer here
	(4) Very Strongly	(3) Strongly	(2) Somewhat Strongly	(1) Somewhat Weakly	(0) Non-Involved	↓ _____
Unrestricted use of alcohol on campus	4	3	2	1	0	_____
Unrestricted use of marijuana on campus	4	3	2	1	0	_____

- II. In terms of recent experience, please indicate, as best you can, how often you engage in each of the activities listed below. (It is important to indicate how often you actually engage in each of the behaviors, not how often you think about doing so but for some reason do not.)

Best Approximation of Current Frequency

	Very Frequently	Fairly Frequently	Occasion- ally	Seldom	Never	Place number of an- swer here
Drinking alcoholic beverages	4	3	2	1	0	_____
Smoking marijuana	4	3	2	1	0	_____

III. Based on your recent experience, check below the degree to which you would feel uncomfortable if you were unable to engage in each behavior. If you do not engage in the behavior, please indicate this by writing "0" in the answer column. For the behaviors in which you do engage, imagine that you want to engage in the behavior and that for some reason you are prevented from doing so. Do you feel uncomfortable? How much so? Indicate below the general level of discomfort. Do not indicate how uncomfortable the behavior would make you feel but only your best estimate of how uncomfortable you would feel if you were unable to engage in the behavior when you wanted to.

If for some reason I were prevented from engaging in the behavior when I wanted to, I would feel:

	Very Uncomfor- table	Somewhat Uncomfor- table	Slightly Uncomfor- table	Not Uncomfor- table	Do not engage in	
Drinking alcoholic beverages	4	3	2	1	0	_____
Smoking marijuana	4	3	2	1	0	_____

IV. To what degree is the frequency that you presently engage in each of these behaviors not to your best interests? Sometimes people characteristically overindulge in one kind of behavior or another which ultimately causes them problems. In your opinion, how much do you presently overindulge in each of the behaviors below (in terms of frequency)?

The FREQUENCY of this behavior is against my best interests to:

	A large degree	A moderate degree	A slight degree	Frequency not against best interests	Do not engage in
Drinking alcoholic beverages	4	3	2	1	0 _____
Smoking marijuana	4	3	2	1	0 _____

## APPENDIX E

### METHOD OF DETERMINING DIRECT VOTE

The direct vote was determined by computing each group's mean of option numbers chosen by the individual members in the direct allocation part of the SPAN procedure. Since each subject selected only one option and there were seven subjects per group, the direct vote was computed by summing the option numbers chosen by group members and dividing by seven. An example of this process follows:

Number of option chosen (Step III on the Voting Sheet)

Member 1	7
2	6
3	6
4	7
5	5
6	4
7	6

$$\Sigma = 41$$

The direct vote for this group is

$$41 \div 7, \text{ or } 5.86$$

## APPENDIX F

### METHOD OF DETERMINING SPAN VOTE

The SPAN outcome was determined for each group by selecting the option which had accumulated more points than any other single option at the end of the cyclic computation. No weighting procedures were used. An example of selecting the SPAN outcome for one group follows:

	Options						
	1	2	3	4	5	6	7
Cumulative Final Group Points	.121	5.723	25.283	70.594	200.617	300.517	102.336

In this case, the final SPAN outcome would be designated as option 6, which accumulated more points than any other option.

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