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AN INTEGRATION THEORETICAL ANALYSIS
OF EXPECTED JOB ATTRACTIVENESS
AND SATISFACTION

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Footnote

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Running Head: Job Attractiveness and Satisfaction

Abstract

Two experiments were performed to study job evaluation processes, using methods of information integration theory. Prospective job seekers rated hypothetical job descriptions according to (a) how much they would like to accept the job, and (b) how satisfied they would feel with the job of that kind. Job descriptions were constructed from a Context x Content factorial design, with 0.0, 0.5, and 1.0 proportion of good items as levels of the two stimulus factors. Graphic plots of the Context x Content effect on liking and expected satisfaction ratings showed a near-parallelism, though a small nonadditive component was also present. Critical tests on both the group and individual subject data eliminated the adding rule and the multiplying rule, and supported the averaging rule. The averaging model was able to account for both the additive and nonadditive patterns in judgments of expected job attractiveness and satisfaction. Practical implications of the averaging of job factors for employee satisfaction were discussed.

An Integration Theoretical Analysis of Expected Job Attractiveness and Satisfaction

Impact of various factors such as pay, working conditions, security, chances of promotion, etc. on job satisfaction has been a subject of controversy in industrial and organizational psychology. The traditional theory of job satisfaction treats all job factors alike and so expects them to produce qualitatively similar effects on job satisfaction. But the two-factor theory (Herzberg, Mausuer, & Snyderman, 1959) divides job factors into context (pay, working conditions) and content (achievement, work itself) categories and assumes that factors from these two categories produce qualitatively different effect on job satisfaction. According to Graen (1966), Herzberg et al. (1969) postulate different nonlinear relationships between each of these factor categories and job satisfaction.

Available evidence argues against the two-factor theory and for the traditional theory of job satisfaction. For example, three studies (Graen, 1966, 1968; Singh, 1975) in which context and content factors were varied systematically in a factorial design did not obtain any evidence for nonlinear relationship. Two other studies (Gray & Levin, 1978; Lindsay, Marks, & Gorlow, 1967) did obtain a significant interaction effect, but the shape of their factorial plots was exactly opposite to the predictions from two-factor theory. But although all the five studies argue against two-factory theory, they disagree whether the rule underlying the integration of context and content factors is additive or nonadditive.

Do the additive and nonadditive patterns reported in the studies cited above reflect different integration rules? Or are they different forms of just one basic integration rule? If there is one basic rule, what is it? The main purpose of the present research was to answer these questions, using the methods of information integration theory (Anderson, 1974a, 1974b).

Method

Experiment 1

Stimuli. Two separate sets of 15 job descriptions were prepared. The first set had *pay* and *physical working conditions* as the context factors and *recognition* and *nature of task* as the content factors. In the second set, the context factors were *job security* and *interpersonal atmosphere*, while the content factors were *advancement* and *responsibility*. Each factor had either positive or negative values in the job descriptions.

Of the 15 job descriptions, six were based on one type of information: Three descriptions had just the context factors; other three had only the content factors. Each factor had 0.0, 0.5, or 1.0 proportion of good items as the levels. The remaining nine job descriptions were constructed according to a pairwise combination of the three levels of the context and content factors. These nine main experimental stimuli constituted a 3 x 3, Context x Content factorial design.

All the job descriptions were typed on 4" x 6" index cards with the items listed in a vertical order. To control the possible effect of order of presentation of items, all the job descriptions of the two sets were written in two forms. In the first form, the context factors were listed first; in the second form the content factors were listed first. That is, the job descriptions of the second form had all the items of the first form listed in exactly the reversed order.

In each set, seven job descriptions had 0.5 proportion of good items of at least one factor. As good and bad items of a factor are not always weighted equally, a further methodological precaution was considered to be necessary. For all these seven job descriptions, two versions were prepared. In the first version, the first item was positive and the second was negative. In the second version, the first item was negative and the second was positive. The two versions of these job descriptions were balanced with half of the subjects of each group. In this way, each subject rated only 15 job descriptions.

Because of these controls and balances, a total of 88 job descriptions were prepared. In addition, 6 practice job descriptions with 3 context and 3 content items were also made. These practice examples were intended to serve as end anchors and to orient the subjects toward the use of the entire response scale (Anderson, 1974b).

Design. The main stimulus design was the 3 x 3, Content x Context factorial. Because of the use of 2 sets of items and 2 orders of presentation, the complete design was a 2 x 2 x 3 x 3 (Set x Order of Presentation x Context x Content) factorial. The first two factors were between subjects, whereas the last two were within subjects.

Subjects. Forty male graduate students from the master's and doctoral programs of the Indian Institute of Technology, Kanpur, India served as subjects. They all were prospective job seekers. They were randomly assigned in equal numbers to the four subgroups corresponding to the set and order of presentation conditions.

Procedure. In experimental session, one subject was run at a time. Upon arrival, he received a typed sheet of instructions which described the nature of the experimental task and his role as a subject. The task was introduced as one dealing with forming impressions of different jobs readily available to him. The task for the subject was to read the given information about each job, form an opinion of it, and rate it according to: (a) How much he would like to accept the job and (b) How satisfied he would feel with the job of that kind. These two judgments were made at two successive phases which were balanced over half of the subjects of each group.

Before making each kind of judgment, each subject worked with six practice examples described earlier. He read the given information, formed an opinion of the job, and then made his judgment along a 31-point graphic scale.

After practice, the subject received a pack of 15 job descriptions, read each and every card carefully, and made his response on the graphic rating scale. The pack of descriptions was then shuffled thoroughly and the procedure was repeated. After all the stimuli were rated twice for one type of judgment, the entire procedure was repeated for the other type of judgment. Subjects worked on the experimental task for approximately 45 minutes.

<u>Experiment 2</u>

Experiment 2 was conducted as a reliability check on the results of Experiment 1. Experimental design, instructions, procedures, etc., therefore, remained identical to those of Experiment 1. However, it differed from Experiment 1 in two ways. First, subjects rated 19 descriptions which included 4 end anchors. These end anchors consisted of 3 context and 3 content factors. This precaution was taken to ensure that data for model testing come from the interior of of the scale (Anderson, 1974b, p. 245). Second, each subject rated all the job descriptions 3 times which permitted a more sensitive test of the model at the level of individual subject. Subjects were sixteen students from the same population as in Experiment 1. Each subjects spent approximately 1.25 hours on the task.

Results

Main Results

Figure 1 plots mean judgment of job attractiveness as a function of context (curve parameter) and content (listed on horizontal axis) factors. The three solid curves are very nearly parallel in both Experiments 1 and 2. From the shape of these two sets of curves, it is evident that the context and content factors produced similar and equivalent effect on ratings of job attractiveness. There is thus no support for the prediction from two-factor theory.

Figures 1 and 2 about here

Figure 2 lists mean expected job satisfaction as a function of context (curve parameter) and content (listed on horizontal axis) factors. The three solid curves show near-parallelism in both experiments. As in Figure 1, the context and content factors seem to have similar effects. Again there is no support for two-factor theory.

Although all the four sets of curves exhibit near-parallelism, there are small, systematic deviations from parallelism. All the four sets of curves have a slight tendency to diverge toward the right. This linear fan divergence is real, as the Context x Content effect was statistically significant in each of the four cases. Further analyses showed that the entire interaction concentrated in the Linear x Linear trend. The _F_ ratio for each interaction and its respective Linear x Linear and residual components are presented in Table 1. Interpretation of this linear fan pattern result is considered next.

Table 1 about here

Multiplying versus Differential-Weight Averaging

Linear fan patterns have generally been interpreted as signs of a multiplying process (Anderson, 1974a, 1974b; Norman, 1977; Norman & Louviere, 1974). But this pattern can also be produced by a conjunctive averaging rule with differential weighting (Singh, Gupta, & Dalal, 1979). If negative values have greater weight, then the averaging model would produce an approximate linear fan shape.

The linear fan pattern is, therefore, consistent with the prediction from both the multiplying and differential-weight averaging principles.

A distinguishing test between multiplying and differential-weight averaging rules may be obtained by considering the dashed curve in Figures 1-2. This curve represents judgments based on content factor alone, with information pertaining to context factor not being specified. The multiplying rule requires that the dashed curve will form part of the linear fan. The averaging rule, on the contrary, implies that the dashed curve should cross over at least one solid curve (Anderson, 1974a; Singh et al, 1979). Figures 1-2 show clear, convincing cross-over in each of the four graphs. This cross-over interaction is evidence against the multiplying rule, and for the differential-weight averaging rule.

To get statistical support for the cross-over interaction, the dashed curve and the middle solid curve data were subjected to a 2 x 3 analysis of variance. A significant interaction in this 2 x 3 analysis of variance proves nonparallelism between dashed and middle solid curves. In all the four cases, the interaction effect was highly significant, F (2, 78) = 49.5 and 24.34 for liking and expected satisfaction judgment in Experiment 1, and F (2, 30) = 65.49 and 52.61 for liking and satisfaction ratings in Experiment 2. Similar crossovers were also obtained for the other single factor, i.e., the context factor. These results support the differential-weight averaging rule and reject the alternative multiplying rule.

Single Subject Analyses

Two analyses of variance were performed on the data of each subject. The first analysis used the basic 3 × 3, Context × Content design; the second analysis used a 4 × 3, Context × Content design. In the latter analysis, one of the rows had information only about the content factor, corresponding to the dashed curves in Figures 1-2. For these single subject analyses, the two replications of the designs provided 9 and 12 df for the within cell variability in Experiment 1. To test for temporal change over the two successive judgments, however, the df for error term were reduced to 8 and 11 in the two respective designs. In Experiment 2 with three replications, df for error were 16 and 22 for the two designs.

These analyses clearly showed that nearly all the subjects followed an averaging rule. In Experiment 1, 34 of the 40 subjects showed a cross-over interaction for job liking, and 35 for job satisfaction. Only 5 or 6 subjects failed to show the cross-over, perhaps because of the limited power with only two replications per subject. Although the possibility that a few subjects may have obeyed an adding rule cannot be ruled out, the averaging interpretation is consistent with the fact that all the sixteen subjects obeyed the averaging rule in Experiment 2 in which there were three replications. The most important information from these individual subject analyses is that parallelism and nonparallelism patterns were really produced by constant- and differential-weight averaging rule, respectively.

Discussion

The chief purpose of the present research was to determine the integration rule for the context and content factors in judgments of job attractiveness and satisfaction. The existing literature presented a conflicting picture, and lacked information which could distinguish between alternative rules. Previous results on additive and nonadditive patterns in job satisfaction thus seemed to reflect different integration rules.

Critical tests between adding and averaging in the present research ruled out adding, and ruled in averaging, showing that parallelism was attributable to the equal weight averaging. Similarly, critical tests between multiplying and differential-weight averaging rejected the former, but supported the latter. Single subject analyses also disclosed that most of the subjects followed averaging rule. The additive and nonadditive patterns were consequences of different weighting strategies and not of different integration strategies. It can, therefore, be said that an averaging rule is able to account for the data reported in this paper.

The present research suggests that the averaging model (Anderson, 1974a, 1974b) can provide a unified interpretation both for the additivity observed by Graen (1966, 1968) and Singh (1975) and for the nonadditivity observed by Lindsay et al. (1967) and Gray and Levin (1978). The averaging model predicts additive as well as nonadditive results depending upon the pattern of weights. When the weight of the information remains invariant over rows (or columns) of the design, then parallelism is obtained. When the weight of the information varies over rows (or columns), then systematic and predictable convergence or divergence is obtained.

Do the equal- and differential-weight averaging rules point to any important difference in the job motivation of persons who follow them? According to the equal-weight averaging rule, a person unhappy with content factors of his job would value its context factors as much as would a person happy with it. Similarly, the content factors would be as important to dissatisfied persons as they would be to persons satisfied with the context factors. This means that for employees who obey a constant-weight averaging rule the context and content factors make separate independent contribution to their job motivation and satisfaction. This is what the traditional theory of job satisfaction predicts (Graen, 1968; Singh, 1975).

The differential-weight averaging rule, in contrast, implies that factor of one type will be more important to persons satisfied rather than dissatisfied with the factor of the second type. Job behaviors of persons following the differential-weight averaging rule can, therefore, be expected to conform with the prediction from need-hierarchy theory (Maslow, 1954).

From the above mentioned interpretations of the two forms of the averaging rule, it is quite evident that the context and content factors do not operate in the way conceptualized within two-factor theory. So, the two-factor theory is of limited use in the study of expected job attractiveness and satisfaction.

Actual job satisfaction and expected job satisfaction are undoubtedly different. The former refers to the outcomes already experienced by an individual worker on his job; the latter refers to one's affective orientation toward anticipated outcomes. Nevertheless, the present integration theoretical analysis suggests that ratings of actual job satisfaction studied previously (Graen, 1966, 1968; Lindsay et al, 1967) and expected job satisfaction studied earlier (Singh, 1975) as well as here follow similar cognitive processes. An averaging rule can, therefore, naturally apply to even actual job satisfaction.

A practical implication of the averaging process deserves emphasis. Addition of any new factor to the set of already existing factors around the job cannot always raise job satisfaction of each and every employee. If the new factor is of the moderate value, averaging it in would make the dissatisfied employees less dissatisfied but would make the satisfied ones less satisfied. Unless the new factor has its value higher than the average value of all the positive factors present around the job, the introduced change is likely to result in dissatisfaction among the previously satisfied employees. This may very well be a reason behind the failure of so many job enrichment programs (Backman, 1975). If it is true, then the averaging model may provide a penetrating approach to the problems faced in job enrichment.

The authors are very much impressed by information integration theory because it provides a useful framework for studying many applied problems (Norman, 1977; Norman & Louviere, 1974; Singh, 1975, 1978; Singh, Bohra, & Dalal, 1979). An important characteristics of the integration rules is that they deal with <u>patterns</u> of responses. This characteristic is vital for between-within group comparisons as well as for comparisons among different kinds of responses made to the same set of stimuli. A concern for <u>patterns</u> in responses helps bypass at least two uncertain assumptions (a) that specific stimuli have the same meaning for all the people, and (b) that all response have uniform origin and distribution. People undoubtedly vary not only in their value systems but also in their personal reference scales (Upshaw, 1969). Nevertheless, they can still be compared with respect to the pattern in their responses to a factorial set of stimuli. In addition, the integration rule can serve as a base and frame for measurement of subjective values of each individual. This is important in applied settings because different people will have different values. Ability of the theory to operate at the level of individual subject makes it well suited for applied research.

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Table 1

F Ratios for Overall Context x Content Effect and for Linear x Linear and Residual Components in Experiments 1 and 2

F-Ratios	Job Attrac-tiveness	Expected Satisfac-tion
	Experiment 1	
Overall Interaction (4, 156)	3.65*	5.51**
Linear x Linear (1, 156)	10.25**	14.07**
Residual (3, 156)	0.47	2.65
	Experiment 2	
Overall Interaction (4, 60)	7.86**	3.57*
Linear x Linear (1, 50)	20.55**	7.99**
Residual (3, 60)	2.01	2.10

* $p < .05$

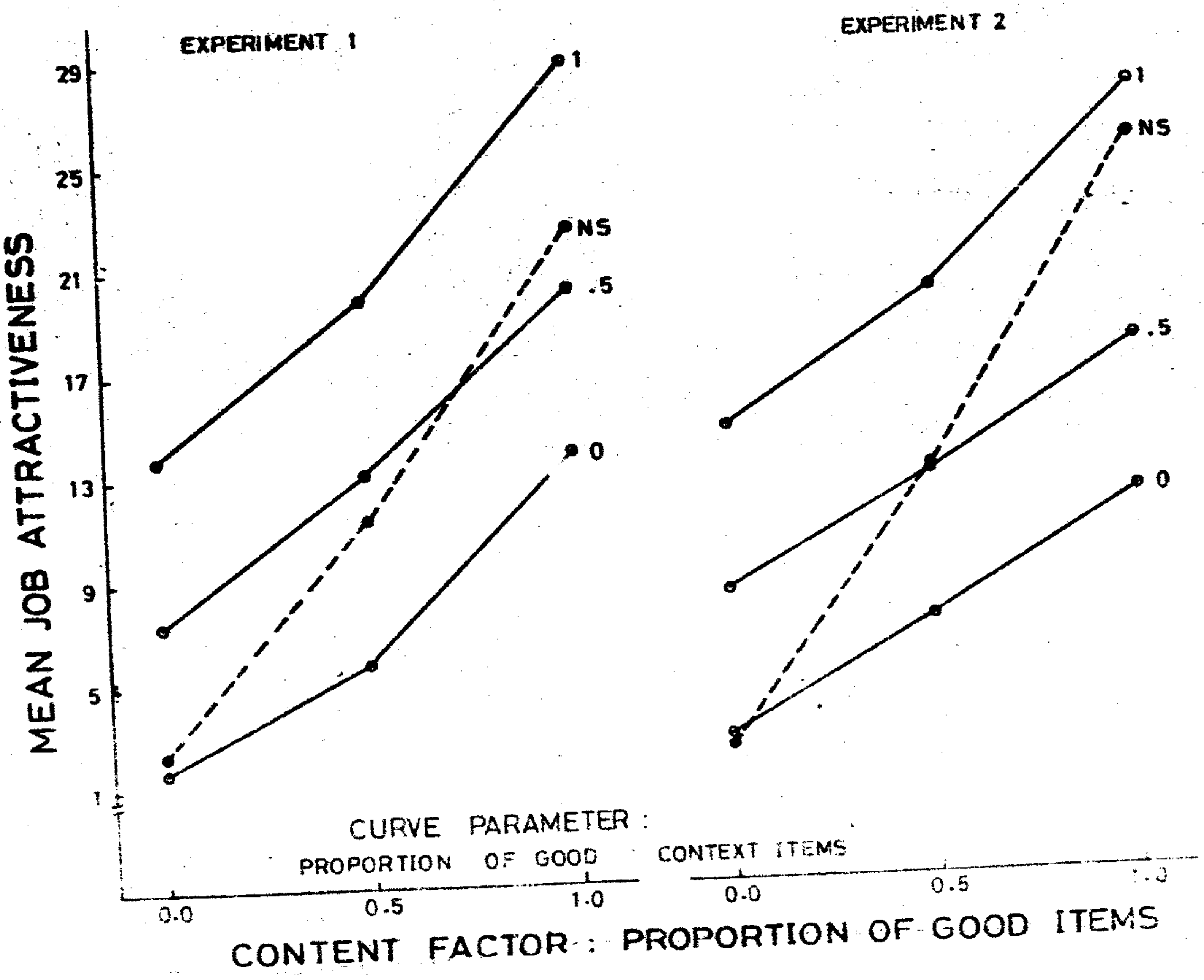
** $p < .01$

Note: Figures in the parentheses are *df* for numerator and denominator of the corresponding F ratio.

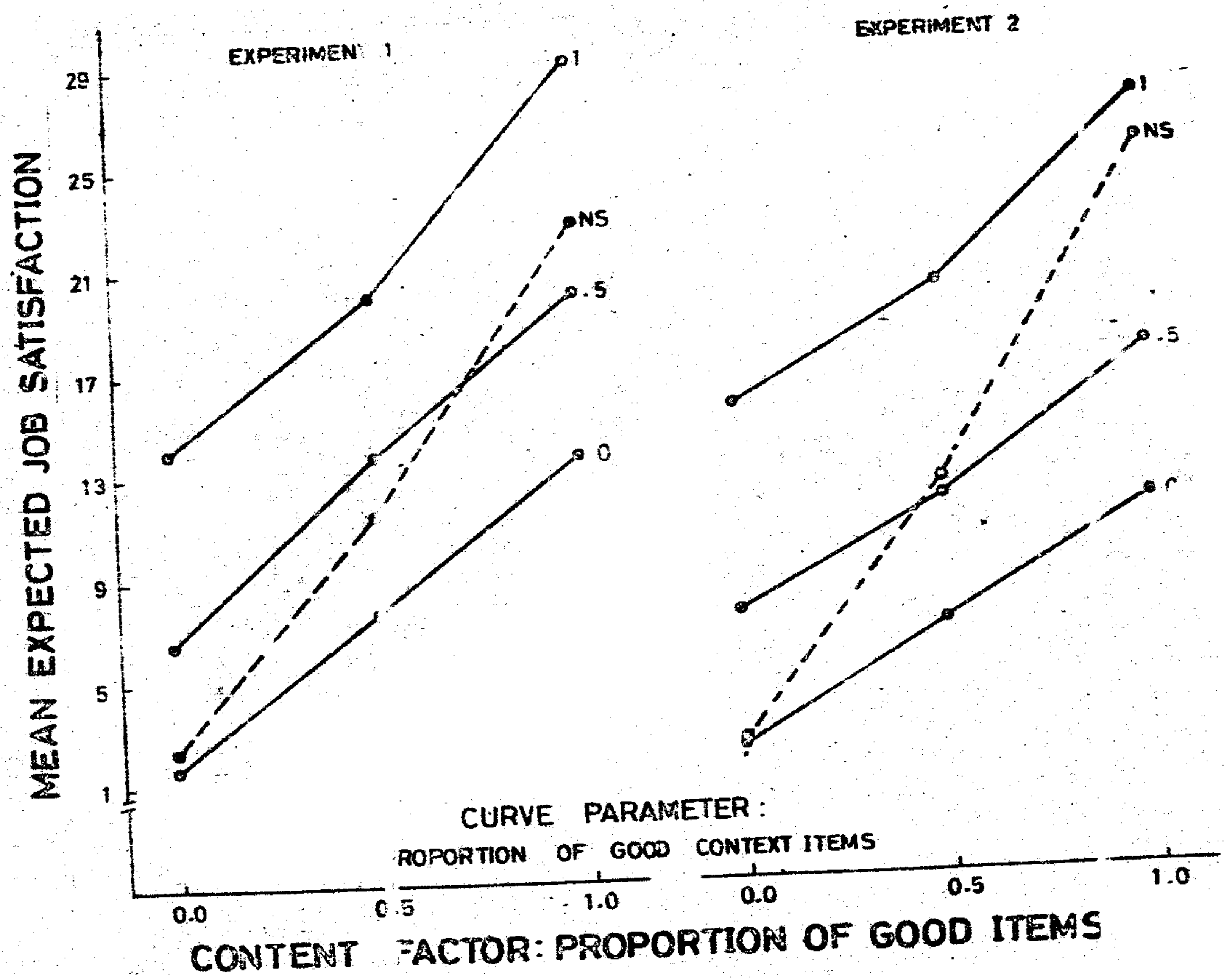
Figure Captions

Figure 1. Mean job attractiveness as a function of context (curve parameter) and content (listed on the horizontal axis) factors. The dashed curve (NS) is based on information about only the content factor. Data from Experiments 1-2.

Figure 2. Mean expected job satisfaction as a function of context (curve parameter) and content (listed on the horizontal axis) factors. The dashed curve (NS) is based on information about only the content factor. Data from Experiments 1-2.



EXPERIMENT 1
EXPERIMENT 2
MEAN JOB ATTRACTIVENESS
1
5
9
13
17
21
25
29
1
NS
.5
0
CURVE PARAMETER : PROPORTION OF GOOD CONTEXT ITEMS
0.0
0.5
1.0
CONTENT FACTOR : PROPORTION OF GOOD ITEMS


MEAN EXPECTED JOB SATISFACTION
29
25
21
17
13
9
5
1
EXPERIMEN 1
EXPERIMENT 2
1
NS
.5
0
CURVE PARAMETER :
ROPORTION OF GOOD CONTEXT ITEMS
0.0
0.5
1.0
CONTENT FACTOR: PROPORTION OF GOOD ITEMS