

Using Single Informants to Study Group Choice: An Examination of Research Practice in Organizational Buying

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Abstract

Purchasing agents are often employed as individual informants in studies of organizational buying. This practice occurs in spite of the fact that several researchers have identified problems with using individual informants to study group buying behavior. The purpose of this study is to examine the appropriateness of using either single or multiple informants both in non-new task and new task group buying situations. We compare the predictive accuracy of a *single-informant, autocracy* model with that of a multiperson, majority rule model. The study includes 104 group decisions made by buying centers in organizations. Overall, we find that data from multiple informants significantly outperforms single informant data for both new task and non-new task situations, and that single/key informant data should be used in organizational buying research only with care and caution.

Organizational buying behavior researchers often identify and use buyers as individual informants to gain quantitative information about processes of group decision making and supplier choice (Moriarty and Bateson 1982). This practice is controversial given empirical evidence that key informant data has questionable reliability and validity (Phillips 1981; Silk and Kalwani 1982). Campbell (1955) suggests that key informants in quantitative research should be well informed about the phenomenon of interest and able to communicate effectively with the researcher. When a buyer is chosen as the key informant based on his or her knowledge of and participation in the decision, this approximates the original purpose of informants (Mead 1953, Campbell 1955). When the buyer is chosen be-

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cause he or she is convenient to the researcher, we can only say that buyer is a single informant, not necessarily a key informant.

Several questions motivate our research. First, in what situations can single informants provide an accurate report on organizational buying behavior? Second, in what situations should researchers collect data from multiple informants about buying center choice? We hypothesize that collecting buying center choice information from a group of individuals is likely to provide better information than that provided by a single individual. Therefore, we make the following conjecture: the less experience the firm has with the product in question, the worse a single informant is likely to do at representing the outcome of a group decision.

In support of our conjecture, we maintain that while the informant may be willing to answer questions about the buying process and choice decision, it is possible that he or she is inexperienced or not very knowledgeable about the product. This possibility could be reduced by gathering data from others involved in the buying process. In using single informants to study group choice in organizational buying, researchers risk generating biased data since inexperienced respondents may "tell more than they can know" (Nisbett and Wilson 1977) to appear credible.

Finally, our third research question centers around a common practice in organizational buying. Should the buyer automatically be designated the single informant? This happens in some cases because buyers have specialized knowledge but in other cases they are chosen because they are convenient to researchers (e.g., Jackson, Keith, and Burdick 1984).

To address the research questions above, we categorize buying decision data as new task or non-new task decisions. Generally, we expect information from multiple informants to allow better choice predictions than information from single informants across decision situations. Specifically, we expect single informant data to improve on choice predictions more in non-new situations than in new task situations (Patton, Puto, and King 1986).

1. Modeling single informant and multiple informant choice

To explore group choice prediction using one versus several informants, we draw on two models proposed by Choffray and Lilien (1980) – the autocracy model to predict choice based on single informant reports and the majority rule model to predict choice based on multiple informant information¹ (see Steckel et al. 1991 for a discussion of both modeling and measurement issues in the group choice area).

The autocracy model implies that an organization designates a single member of the buying center as the decision-maker in supplier choice. By having a single decision-maker, his or her preferences become the preferences of the entire buying center and, thus, he or she acts autocratically (Choffray and Lilien 1980). Identification of the autocrat is based on estimated expertise weights of buying center members. Findings of Patton et al. (1986) support the existence of auto-

cratic decision making in organizational buying; in many cases, individuals, not groups, tend to make low-risk, modified rebuy decisions.

We use the majority rule model to incorporate information from multiple informants in buying center choice. In a test of Choffray and Lilien's (1980) group choice models, the majority-rule model is relatively robust compared to other multiperson choice schemes (Wilson, Lilien, and Wilson 1991). While this may or may not be the *best* model for representing group choice, it is a sensible one with theoretical and empirical support (see Choffray and Lilien 1980 and Wilson et al. 1991).

The majority rule model assumes that to be acceptable, a supplier alternative must be the choice of at least a prespecified number of buying center members. More formally, the model states that the probability that the buying group chooses some alternative from a choice set is equal to the probability that the alternative is the first choice of at least a simple majority of buying group members. In a three member group, that alternative must be chosen by either two or three members; in a two member group, both individuals must agree on a choice. When alternatives are equally preferred (tied), a secondary decision scheme is invoked to eliminate ties.²

2. Method

Our data are from a multipurpose survey; another analysis of data from this collection effort is reported by Wilson et al. (1991). Thirty-two buying centers in organizations evaluated three to five decisions, making a total of 104 decisions for a range of products and services commonly purchased by many businesses (e.g., personal computers, mainframe computers, MRO items, valves, steel, chemicals). We constructed buying decisions so that buying centers could choose one (single source) or several (multiple source) vendors from a set of nine possible suppliers. The product and service decisions involve price, quality, delivery, and service/maintenance attributes displayed in an orthogonal array.

In the first stage of data collection, members worked individually to evaluate the vendor alternatives. Each person divided 100 points (representing 100 percent of the buying requirements) among the nine suppliers to reflect the respondent's preference(s) in supplier choice. After this task, buying center members rated themselves and the other participants, again using a 100-point constant sum scale, on the expertise of each person in the decision. Expertise weights are estimated by Choffray and Lilien's (1980) procedure to correct for self report bias. To operationalize the autocracy model, the buying center member with the greatest weight is designated the autocrat.

In the second stage of data collection, buying center members worked as a group to evaluate the same decisions. They discussed the nine suppliers, decided which ones would get a percentage of the requirements, and agreed on the percentage (of the total requirements) each supplier would be awarded.³

First stage data allowed us to *estimate* individual and, thus, group choice probabilities for the two models. Each of the models gives a vector of nine estimated group choice probabilities (one probability for each vendor). The group choice probabilities we obtain from the second stage are what we use as actual choice probabilities. We then test the fit of the predicted group choice vectors (from stage 1) against the stated group choice vectors (in stage 2). Specifically, we use a χ^2 goodness-of-fit statistic to note which model's prediction is closest to the stated group choice. We designate the model with the lowest χ^2 statistic as the one that predicts choice most accurately.

After buying center members completed the group task, they were asked, collectively, to classify the decision as a new task or non-new task for their firm. All buying centers reached agreement on this question with little difficulty.

3. Findings

We examine three comparisons to answer our research questions. First, we examine the predictive ability of the autocracy model in non-new task and new task situations to note when use of a single informant may be appropriate. According to table 1A, the autocracy model predicts choice better in non-new task situations than in new task decisions. Specifically, the autocracy model is the better choice predictor in 41 percent of non-new task decisions compared to 14 percent of new task decisions ($Z = 2.81, p < .01$).

Consider, now, statistical significance of improved fit as an indicator of superiority.⁴ The autocracy model predicts choice significantly better than the majority rule model in 21 of the 28 cases in the non-new task situations where it is directionally superior. The majority rule model predicts choice well directionally in non-new task situations (56%) compared to the autocracy model (41%; $Z = 1.76, p < .05$). In 20 of these 39 cases, the fit of the majority model is not significantly better than that of the autocracy model, however. Thus, for non-new task situations, a single informant model does nearly as well as a multiple informant model.

Second, we compare results for the majority rule and autocracy models to note when multiple informants should be used. Results in table 1A indicate that multiple informants appear necessary in new task situations. The majority rule model predicts well here while the autocracy model does not. For example, the majority rule model is the better choice predictor 77 percent of new task decisions while the autocracy model is the better predictor in only 14 percent of the decisions ($Z = 5.29, p < .01$). Also, the majority rule model has a significantly better fit ($p < .05$) to the group choice than the autocracy model in 19 of the 27 decisions where the majority rule model wins. For the five decisions in which the autocracy model is the better predictor, there are no cases in which the fit of the autocracy model is significantly better than the fit of the majority rule model.

Third, we compare the buyer as autocrat⁵ to the most expert to examine the appropriateness of relying on buyers (by default) as single informants. Results are

Table 1. Predicting group choice using single and multiple informants

	Part A: Expert as informant						Overall
	Non-new task			New task			
Single Informant (Autocracy)	p <	.05	21	p <	.05	0	
Model Wins	p	ns	<u>7</u>	p	ns	<u>5</u>	
Subtotal			28*			5	33
Multiple Informant (Majority Rule)							
Model Wins	p <	.05	19	p <	.05	19	
	p	ns	<u>20</u>	p	ns	<u>8</u>	
Subtotal			39			27	66
Ties			2			3	5
n			69			35	104
First Choice Analysis							
Autocracy model correctly predicts first choice			7			0	
Majority Rule model correctly predicts first choice			9			6	
Both correctly predict first choice			38			19	
Neither correctly predicts first choice			7			5	
Group choice equally split among alternatives			8			5	
n			69			35	
	Part B: Purchasing agent as informant						Overall
	Non-new task			New task			
Single Informant (Autocracy)	p <	.05	15	p <	.05	4	
Model Wins	p	ns	<u>8</u>	p	ns	<u>11</u>	
Subtotal			23			15	38
Multiple Informant (Majority Rule)							
Model Wins	p <	.05	22	p <	.05	12	
	p	ns	<u>22</u>	p	ns	<u>3</u>	
Subtotal			44			15	59
Ties			2			5	7
n			69			35	104
First Choice Analysis							
Autocracy model correctly predicts first choice			6			1	
Majority Rule model correctly predicts first choice			7			3	
Both correctly predict first choice			39			22	
Neither correctly predicts first choice			9			5	
Group choice equally split among alternatives			8			4	
n			69			35	

*Interpretation: In non-new task decisions, the single informant model predicts choice better than a multiple informant model in 28 of 69 decisions. In 21 of the 28 non-new task decisions, the fit of the single informant model is significantly better than the fit of the multiple informant model ($p < .05$). In the remaining seven cases, the fit of the single informant model is not significantly better than the fit of the multiple informant model.

similar to those obtained in the analysis of the expert as autocrat. For example, the autocracy model predicts choice significantly better than the majority rule model in only four of fifteen new task decisions. In non-new task decisions, 15 of 23 autocracy model predictions are significantly better than those of the majority rule model. This supports the idea that a single informant may be appropriate for non-new task settings.

When the purchasing agent is the autocrat, multiple informant reports again seem necessary in new task situations. Most (12 of 15) predictions of the majority rule model are significantly better than predictions for the autocracy model in new task decisions. In non-new task decisions, half (22 of 44) of the predictions are significantly better than those of the autocracy model. Thus, multiple informants add information in new task situations whether the autocrat is an expert or a buyer.⁶ These findings support our research conjecture that the less experience a firm has with a product (new task), the worse a single informant is likely to do at representing the outcome of a group choice.

We provide results in table 1 on the extent to which the models are able to predict the first choice vendor alternative, regardless of the overall fit of a model's predicted distribution to the group's stated choice distribution. To interpret these results, consider the results for the 69 modified rebuy decisions reported in table 1A. The autocracy model alone predicts first choice in seven decisions and the majority rule model alone predicts choice in nine decisions. Both models correctly predict first choice in 38 decisions. Neither model predicted choice in seven decisions and group choice was equally split in eight decisions. Results for the new task decisions are interpreted similarly. Thus, we do not find a substantial difference in model predictions when selecting the first choice alternative as the only criterion; the single informant begins to do most poorly when the entire list of alternatives is under evaluation. This latter situation is of critical significance when the focus of the research is on locating vulnerable or switchable customers (Gensch, Aresa, and Moore 1990).

4. Discussion

The value or benefit of using multiple informants in research practice is in the greater reliability that comes from having more information rather than less. This is accompanied by an increase in research time and costs, however. To avoid those high costs in data collection, researchers often resort to using single informants. Our results suggest that single informants are most appropriate in non-new task decisions. In addition, our results indicate that it matters little who is chosen as the informant (most expert, least expert, buyer), as long as the informant is reasonably knowledgeable about the buying process.⁷

This conclusion raises a question of who to choose for that single informant? To answer this question, we compare the relative fit of the expert-autocracy model with that of the buyer-autocracy model. We find that experts predict choice better

than purchasing agents for routine buys and purchasing agents predict choice better than experts for new tasks. The buyer is the expert in 20 cases. Again, this may be affected somewhat by the nature of the buying centers we studied.

If a researcher must use single informants in studying new task decisions, we suggest that the informant be identified as truly key. This may require collection of corroborating evidence in buying center activity from multiple informants (Moriarty and Bateson 1982), by direct observation, or by verification via document analysis (Denzin 1978; Vyas and Woodside 1984), at least in the initial phases of the research. In addition, face-to-face interviews may provide additional assurance of finding a key informant compared to the common practice of using mail surveys to the purchasing agent as a default respondent (Kohli 1989; Puto et al. 1985; Naumann et al. 1984). In our study, we did not cover truly routine rebuy or simple reorder situations. Patton et al. (1986) maintain that it is quite appropriate to use a single, key informant – the rebuy, or ordering individual – as a respondent in such situations, and we do not quarrel with their results.

5. Limitations and conclusions

Our operationalization of the autocracy model uses the *preferences* of the autocrat in comparison to the preferences of the group. This is somewhat different from obtaining predecision information on buying group choice from an autocrat and then comparing the autocrat's prediction to what the buying center actually did. However, use of preference information as a surrogate for choice is a common research practice; we feel that we have a relatively good surrogate approach given the motivation for the autocracy model (Choffray and Lilien 1980). A second limitation is the use of simulated rather than real decisions. However, buying center members perceived the decisions as realistic and a high degree of ecological validity was obtained (see Wilson et al. 1991 for details).

Use of the majority rule and autocracy models raises the issue of reliability (averaging judges who agree) versus bias (purchasing agents or others who may be systematically off). The benefit of our modeling approach here (and developed in more detail in Wilson et al. 1991) appears to come from explicitly modeling the combining of preferences process. As we have seen, a single agent (whether the most expert, the buyer, etc.) may provide good data on organizational first choice preferences. But, in situations that might be too frequent to be tolerated in a research study, that informant could provide quite biased and misleading data as well.

In conclusion, our exploratory work indicates that multiple informants add information and should be used particularly when studying new task decisions. Researchers and practitioners would be wise to use multiple informant methods whenever possible, except perhaps in routine rebuy situations. Perhaps, then the key lesson about single informants is to avoid the risk of using them: why not buy multiple informant insurance?

Notes

1. The autocracy and majority rule models represent single informant and multiple informant choice, respectively. While other types of group choice models have been identified and tested (see Corfman and Gupta 1992 for a review), these models provide reasonable representations of individual and group choice in the context of our study.
2. The secondary scheme we used to eliminate ties is an equiprobability rule, where importance weights are assumed equal across individuals (Choffray and Lilien 1980).
3. In collecting data this way, we use preferences of buying center members to estimate choice probabilities. This is a common practice for marketing researchers who cannot feasibly observe decisions as they happen in reality. Other group choice studies that have employed this method include those by Corfman and Lehmann (1987) and Kriewall (1981).
4. To test the significance of the relative fits of the two competing models, we use the following as an index:

$$Y = \chi^2 \text{ Model 1/df 1} / \chi^2 \text{ Model 2/df 2.}$$

Y is (roughly) distributed as F with (df 1, df 2) degrees of freedom (Hastings and Peacock 1975). In our case, there are 8 degrees of freedom associated with each χ^2 statistic.

5. The designation of the autocrat changed in 75 decisions and remained the same in the 29 decisions in which the buyer was the expert.
6. An analysis of the data with the least expert individual as autocrat gave similar results.
7. We offer this observation with caution, however, because members of buying centers in our study were usually involved in the supplier selection phase of the decision. Thus, any member likely has a high degree of knowledge about the decision. Other buying centers with members not involved in supplier selection might be less knowledgeable as informants.

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