

# Testing the Conventional Representation Model for Residential Real Estate Brokerage

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**Abstract.** The purpose of this study is to determine whether the conventional model that the real estate agent is the exclusive agent or subagent of the seller best fits the understanding of all parties during the critical stages of contract negotiations. A survey of Georgia licensees indicates practitioners' attitudes and behaviors are at variance with the conventional model.

## Introduction

Conventional wisdom among most courts, the real estate industry, regulators, and scholars is that residential real estate agents are agents of the seller. Previous research has demonstrated that buyers do not recognize this and often believe that they are represented by agents in a sale. A survey of Georgia real estate licensees indicates that agents play a role that differs from the exclusive seller representation orthodoxy.

## Background

Much research exists on the classic principal-agent conflict [in real estate context, e.g., 2, 6, 12, 16]; however, little serious work outside the legal literature examines the issue of whom brokers represent vis-a-vis buyers and sellers. The issue is not so much, *Are buyers harmed by those in the middle of a market that provides exclusive representation only to sellers?*, as it is, *Are those in the middle of the market in fact providing exclusive representation only to sellers?* The real estate industry and most courts would have us believe that the answer to the latter issue is *yes* [9, 10].

Formal evidence that most real estate consumers fail to recognize that real estate agents represent solely the sellers appeared in the Federal Trade Commission's survey of 1983. It revealed the following:

Where a cooperating broker was involved, 72 percent of the buyers believed that the cooperating broker was representing the buyer and not the seller. Even 31 percent

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of the buyers in transactions where only one broker was involved believed that the broker represented the buyer. [3, p.69]

When sellers were asked whom the other agent represented in a co-op sale, 82% responded that the broker represented the buyer and not the seller.

Some evidence that real estate agents themselves do not adhere to the role of seller advocacy comes from the formal observations of a residential brokerage firm [5]. Irrespective of subagency, House observes, "Ostensibly, the listing agent represents the interests of the vendor and the selling agent those of the purchaser. In practice, they usually collude to effect a compromise" [5, p.11]. He also noted an often overlooked inconsistency of incentives between agent and seller: "The [seller] wishes to get as high a price and as good terms as possible for his house, while the [agent] hopes for a quick sale and his commission" [5, p.44].

Similarly, the National Association of Realtors' Agency Task Force found "an immediate and pressing need for a clarification of the agency status of the real estate broker/salesperson vis-a-vis real estate seller and real estate buyer" [14, p.7]. Without first scrutinizing the conventional model (exclusive agency/subagency to seller) and evaluating alternatives (save the statement that the dual agency model is "totally inappropriate" [14, p. 11]), the task force concluded that states should mandate written disclosure of agency status. The resulting disclosure statement recommended by NAR describes the brokers' duties under the conventional model [9].

Evidence that most real estate brokers are "schizophrenic" [15] comes from an onslaught of litigation. William D. North, Senior Vice President and General Counsel of the National Association of Realtors, lamented ". . . classic legal labels—fiduciary, agent, middleman—do not fit the realities of the real estate business . . . . At the same time, the courts have yet to clearly identify the alternative principle or principles which will govern" [8, p.55].

The most common result of brokers' failure to act solely as the seller's agent when generally adhering to the exclusive agency model is the "inadvertent" creation of an undisclosed dual capacity. Finding inadvertent dual agencies pervasive in residential brokerage has serious implications for real estate consumers and the brokerage industry. A party to a real estate transaction involving an undisclosed dual agent may lose bargaining power by having a confidence breached or may lose a contract via the other party's resultant right to rescind. The broker may lose more than just a commission and litigation expenses. He or she could become liable for damages sustained by the party whose contract was rescinded [1, 11]. Furthermore, the integrity of the entire real estate brokerage profession is compromised.

The prevailing wisdom, therefore, is (a) since many consumers are unaware of the representation model in conventional brokerage, and (b) since the seller agency/subagency model is taught to and practiced by licensees, then (c) disclosure of this model will educate real estate consumers and, perhaps, reduce broker liability from inadvertent dual agencies. An alternative hypothesis, however, is that exclusive seller representation does not truly describe residential real estate brokerage.

Although progress has been made toward answering the factual issue of whom the broker represents by surveying real estate consumers [3] and through direct observation [5], most of the literature in this area builds on premises founded on personal experience and conjecture. No survey exists to determine how the real estate agents themselves view their representative roles respecting buyers and sellers during negotiations. The purpose of this study is to determine the agent's actions and attitudes toward his or her role during negotiations between home sellers and buyers in the conventional brokerage process. It attempts to determine, via

a survey of Georgia licensees, whether that which they practice differs from the legal models of agency they have been taught.

## Survey Methods and Sample Characteristics

A random sample of 1,000 active, resident real estate licensees was drawn from a database at the Georgia Real Estate Commission. A blind mail survey was chosen over telephone and personal interviews for its anonymity and for obtaining honest responses to socially sensitive items. To help insure an adequate response rate, several steps were taken.<sup>1</sup> Nonetheless the response rate was 17%.

After final revision of the questionnaire<sup>2</sup> and concurrent with the mailings, the questionnaire was distributed in some continuing education and post-licensing courses offered in the greater Atlanta area. Since most of this education is met via correspondence courses and the few in-class courses offered around the state have small classes, and since these courses are not required of those licensed before 1980, the sample is clearly one of convenience, favoring salespersons (rather than brokers) in the Atlanta area. The primary purpose of the secondary sample was to bolster data collection, if necessary, for the overall and subgroup response rates mentioned above. Another important use of the alternative sample is for comparison to the mailed survey to detect possible response rate (self-selection) bias; however, for the reasons mentioned above, the alternative sample is not a perfect control. The classroom-administered questionnaires yielded a 100% response rate from 101 licenses.

## Questionnaire Items and Results

All but one of the items on the questionnaire can be categorized into three types: (a) characteristics of the respondent's business, (b) behavioral manifestations of agency vis-a-vis buyers and sellers, and (c) attitudinal characterizations of agency vis-a-vis buyers and sellers. The last item allows for comments by the respondent.

### *Business Characteristics*

The business characteristics include (a) type of license held, (b) length of time in business, (c) level of activity in home sales, (d) incidence of acting as selling agent only, (e) unconventional practice of buyer brokerage, (f) population characteristic of market area, (g) Realtor affiliation, and (h) MLS membership.

The attributes of the respondents are illustrated in Exhibit 1. As anticipated, the classroom sample overrepresents less-experienced, urban practitioners in contrast to those of the random mail survey.

Chi-square analyses in the form of contingency tables for each of the eight characteristic items with each of the remaining behavioral and attitudinal items were made.<sup>3</sup> Of interest here is the determination of whether behaviors and attitudes are correlated with respondents' license status, experience, etc., as an additional check for response rate bias of the mail survey. All tests were negative at  $\alpha = 5\%$ . This means that licensees probably (95% confidence) do not differ in their attitudes or behaviors along lines established in the first eight items of the questionnaire.<sup>4</sup> This fact clearly lessens the concern for response rate bias.<sup>5</sup>

**Exhibit 1**  
**Respondent's Characteristics**

Item	# Obs. (% of sample)	
	Classroom	Mail
1. Salesperson	90 (89%)	118 (72%)
Broker	11 (11%)	46 (28%)
2. Active in real estate business < 5 year	78 (79%)	76 (46%)
Active in real estate business > 4 year	21 (21%)	88 (54%)
3. Sold < 10 houses last year	83 (86%)	87 (53%)
Sold > 10 houses last year	14 (14%)	77 (47%)
4. Acted as selling agent in 50% or less	65 (72%)	108 (67%)
Acted as selling agent in > 50%	25 (28%)	54 (33%)
5. Acted as buyer's agent	16 (18%)	27 (17%)
Conventional brokerage	73 (82%)	136 (83%)
6. Primarily sales in county < 100,000 (rural)	31 (35%)	72 (44%)
Primarily sales in county > 100,000 (urban)	57 (65%)	91 (56%)
7. Affiliated with NAR	57 (61%)	129 (79%)
Not affiliated with NAR	37 (39%)	35 (21%)
8. MLS member	65 (69%)	123 (75%)
Not MLS member	29 (31%)	41 (25%)

### *Behavioral Manifestations*

Seven items elicit information regarding broker-buyer allegiance and the frequency of sharing confidential bargaining information among the consumers and brokers in a co-op sale. The responses to these behavioral items are grouped into quarters (1 = 0% - 24%; 2 = 25% - 49%; 3 = 50% - 74%; 4 = 75% - 100%) and illustrated for the classroom survey and the mail survey in Exhibit 2. Additionally, Exhibit 2 describes the raw data for these items.

Median tests [13] were made of the responses to detect whether the classroom and mail samples differed. The indicated chi-square values for items 9-15 are .004, .017, .105, .793, .031, .656, and .045, respectively. Since the chi-square value for an alpha of 5% is 3.8, it is unlikely that the two samples differ in responses.

Item 9 seeks licensees' view of the proportion of homebuyers who stay with one agent. The degree of buyer/broker allegiance vis-a-vis other brokers may give some indication of buyer/broker alliance vis-a-vis sellers. The FTC survey [3] of buyers found 65% used only one broker in the search for a house and licensees in the present survey perceive that 50% of buyers search with only one agent. Thus, the licensee's perception is not very different from what buyers reported.

The FTC survey [3] also revealed that the majority of sellers and buyers indicated they told the agent a confidential price beyond which they would not go and that usually confidential information from the other side was passed to them. Items 10-15 go right to this issue under the scenario of a co-op sale. They read as follows:

10. What percent of the time do you think a buyer will tell the selling agent his/her confidential maximum acceptance price?
11. What percent of the time that a selling agent has this information will he or she disclose it to the listing agent?

**Exhibit 2  
Respondent's Behavioral Perspectives**

Item	# Obs. (% of sample)	
	Classroom	Mail
9. Percentage of homebuyers using only 1 agent:		
0-24%	12 (16%)	35 (21%)
25-49%	16 (21%)	32 (20%)
50-74%	29 (38%)	58 (36%)
75-100%	20 (25%)	37 (23%)
10. Frequency of confidential information passed from buyer to selling agent:		
0-24%	14 (14%)	40 (25%)
25-49%	14 (14%)	20 (12%)
50-74%	28 (30%)	36 (22%)
75-100%	40 (42%)	66 (41%)
11. Frequency this confidential information passed from selling agent to listing agent:		
0-24%	31 (33%)	54 (33%)
25-49%	15 (16%)	23 (10%)
50-74%	26 (28%)	43 (27%)
75-100%	21 (23%)	42 (30%)
12. Frequency this confidential information passed from listing agent to seller:		
0-24%	24 (25%)	42 (26%)
25-49%	10 (11%)	11 (7%)
50-74%	26 (27%)	31 (19%)
75-100%	35 (37%)	78 (48%)
13. Frequency of confidential information passed from seller to listing agent:		
0-24%	16 (17%)	38 (23%)
25-49%	7 (7%)	23 (14%)
50-74%	25 (26%)	27 (17%)
75-100%	48 (50%)	75 (46%)
14. Frequency this confidential information passed from listing agent to selling agent:		
0-24%	35 (36%)	67 (41%)
25-49%	14 (15%)	26 (16%)
50-74%	25 (26%)	37 (23%)
75-100%	22 (23%)	33 (20%)
15. Frequency this confidential information passed from selling agent to buyer:		
0-24%	37 (39%)	61 (38%)
25-49%	10 (11%)	19 (12%)
50-79%	19 (20%)	35 (21%)
75-100%	28 (30%)	48 (29%)

12. What percent of the time that a listing agent receives this information will he or she disclose it to the seller?
13. What percent of the time do you think a seller will tell the listing agent his/her confidential minimum acceptance price?
14. What percent of the time that a listing agent has this information will he or she disclose it to the selling agent?

**Exhibit 2 Continued**

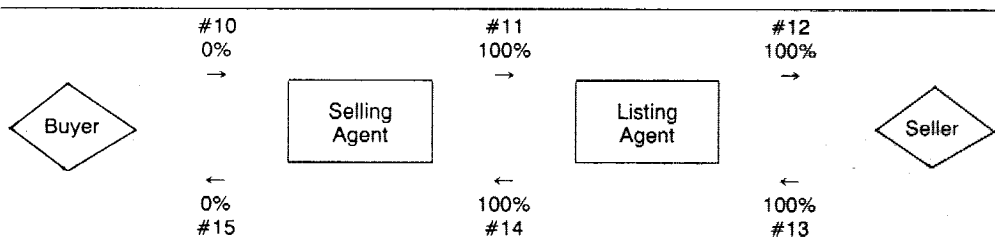
<u>Classroom</u>							
Item	9	10	11	12	13	14	15
N	77	96	93	95	96	96	94
Nmiss	24	5	8	6	5	5	7
Median	50.0	52.5	50.0	50.0	72.5	40.0	45.0
Quartile 3	75.0	80.0	65.0	90.0	90.0	70.0	76.2
Quartile 1	30.0	40.0	20.0	20.0	50.0	11.2	10.0
<u>Mail</u>							
Item	9	10	11	12	13	14	15
N	162	162	162	162	163	163	163
Nmiss	2	2	2	2	1	1	1
Median	50.0	55.0	50.0	62.5	60.0	30.0	50.0
Quartile 3	70.0	80.0	75.0	91.2	85.0	60.0	75.0
Quartile 1	25.0	23.7	13.8	20.0	25.0	10.0	10.0

15. What percent of the time that a selling agent receives this information will he or she disclose it to the buyer?

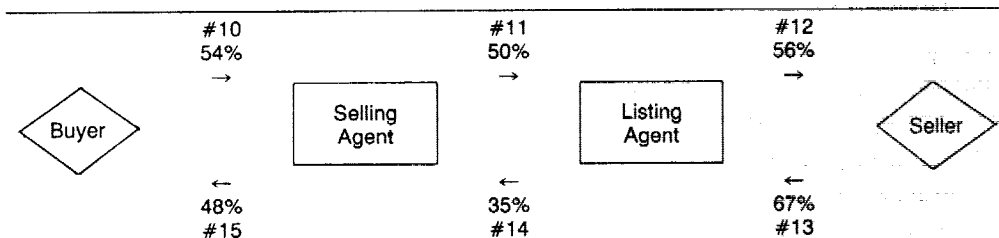
In an effort to get honest responses to these sensitive questions, they have been depersonalized by having the respondents reflect upon what they think is happening in the community rather than solely in their own practices. Exhibit 3 illustrates the flow of this confidential price information in the conventional model of exclusive agency and subagency to the seller and keys each channel to the questionnaire items above. The questionnaire results thus indicate whether this model, or one of the other representation models, is the one realized in practice.

Exhibit 3 shows that if the conventional model describes actual practice, we would expect, for example, 0% of negotiations to include the buyer's giving the selling agent confidential price information, because at this stage the agent is an advocate of the seller and adversary of the buyer. Likewise, nonzero responses for item 15 indicate a clear violation of the fiduciary relationship of the selling agent's subagency to the seller. The remaining channels for confidential

**Exhibit 3  
Expected Exchange of Confidential  
Price Information in a Co-op Sale  
(Exclusive Seller Agency Model)**



**Exhibit 4  
Actual Exchange of Confidential  
Price Information in a Co-op Sale**



information sharing should flow freely since both agents work for the seller and cooperate to produce a sale on the best terms for the seller.

Exhibit 4 displays the actual amount of confidence-sharing perceived by licensees. Of course, the respondent must determine what is indeed confidential information as opposed to posturing by the seller or buyer. Apparently agents are not very cooperative in a co-op. Only half the time that the selling agent has confidential price information from the buyer will he or she aid the seller by sharing it with the listing agent.

The selling agent is entrusted with seller information by the listing agent only a little more than a third of the time.

The agents surveyed were of the opinion that more than half of the buyers indicate to selling agents their maximum prices and thus compromise their negotiating positions under the conventional model. About two-thirds of sellers tell listing agents their minimum acceptance prices, leaving a substantial number who do not entrust such information with "their" agent.

Perhaps the most critical test of the conventional model is the measurement of the flow of confidential price information to opposing parties in the transactions. Over a third of the time that listing agents are told a buyer's maximum price, they keep it from the seller. Also, in clear breach of fiduciary duties under the conventional model, where selling agents know a seller's minimum acceptance price, nearly half the time they convey it to the buyer.

Comparing the expected values of Exhibit 3 with those observed in Exhibit 4 via an overall contingency table yields a chi-square value of 832, thus indicating near certainty (greater than 99.9%) that the values observed differ from those expected. Clearly these flows of confidential information are inconsistent with the conventional model of exclusive seller representation; rather, they support the notion that brokers are hired to help the parties conclude a transaction. Also, these results are consistent with a principal/agent theory applied to the incentive systems for residential real estate brokers—brokers earn more money by increasing the frequency of sales than by helping sellers hold out for the last dollars in buyers' zones of agreement.

*Attitudinal Characterizations*

Attitudinal characterizations of agency were elicited by having respondents think of their own experiences as a selling agent sending offers from a buyer on a listing agent of another firm and rank statements that follow in order of preference to reflect their own view of their role in this situation.

### The statement

The selling agent is the seller's advocate. He or she will use every effort to persuade the buyer to make as many concessions and pay as much as possible to get the best deal for the seller.

is strongest in characterizing an exclusive seller agency and perhaps the closest to the understanding of the courts and the industry's position that the conventional broker represents the seller and not the buyer. On the other hand, the statement

The selling agent shows the buyers several houses and develops a close, working relationship. After finding them the house they want, the agent tends to help them get a contract on good terms for the buyer.

identifies an alliance of the real estate agent with the buyer and therefore contradicts the conventional model.

The remaining statements represent models other than single agency. For example, the statement

It is now up to the parties to find a deal. A selling agent avoids advising either on price while providing various kinds of support.

reflects the position of a middleman. A middleman merely brings the parties together and tries to avoid representing either party. This role is passive whereas the following statement describes active engagement in the negotiations process:

The selling agent actively promotes a sale at any price he/she can get the parties to agree to. The agent mediates between buyer and seller (or listing agent), working on the buyer to come up and the seller to come down.

This describes the role of a mediator during the dispute over contract price and terms. Since the agent is usually compensated only when a contract is consummated, this view is consonant with his or her own self-interest (described before as the classic principal-agent conflict). Lastly, the statement

Having the best knowledge of what the property is worth, the selling agent promotes a sale at what the agent considers to be fair in price and terms so that both the buyer and seller end up with a good deal.

describes the agent as a purveyor of equitable real estate transactions. The agent is more of an arbiter or dual agent during the negotiations.

If any but the first statement discussed above truly describes how practitioners view their role during negotiations, then most of the rules and understanding of agency models in real estate brokerage propounded by the courts and trade associations are simplistic.

The mail and classroom results are shown in Exhibit 5. To determine whether any significant preferences exist for these statements in either sample, we find the *F*, statistics for the mail and classroom surveys to be 39.8 and 48.7, respectively [7, p.462].<sup>6</sup> The chi-square hurdle at a 99% confidence level with 4 degrees of freedom is 13.3; hence, a significant preference exists among the treatments (statements) in both samples.

The location of such preferences, i.e., which statements are significantly preferred over the others, is found via a multiple comparisons test for Friedman rank sums [4, p.151].<sup>7</sup> The statistic gives, at 99% confidence, hurdles of 88 and 62 for the mail and classroom surveys.



**Exhibit 5**  
**Results of Item #16 Licensees' Perception of Role of Selling Agent in**  
**Conventional Co-op Sales**

Treatment (Statement)	Model	Sum of Ranks	
		Mail n = 145	Classroom n = 72
T16	Dual Agent	331	146
T17	Middleman	485	260
T18	Mediator	456	217
T19	Seller Agent	444	257
T20	Buyer Agent	459	200

The differences in rank sums for each pair of treatments with resulting preference ordering for both samples is displayed in Exhibit 6. The statements that are not significantly preferred over one another are braced. In words, the dual agency model is significantly preferred over all others in the mail sample and is significantly preferred over all but the buyer agency model in the classroom sample.

The medians test between samples for the first, second, third, fourth, and fifth statements yields chi-square values of .71, 2.83, .79, .04, and 1.93. Thus, it is not likely that these samples significantly differ since these chi-square values are less than the 95% confidence value of 3.8.

Even though some minor differences exist in the rankings between the samples, it is obvious that the conventional model of exclusive subagency to the seller is not preferred

**Exhibit 6**  
**Multiple Comparisons for Preferences of Models**

Mail			
$ R_1 - R_2  = 154^*$	$ R_1 - R_3  = 125^*$	$ R_1 - R_4  = 113^*$	$ R_1 - R_5  = 128^*$
$ R_2 - R_3  = 29$	$ R_2 - R_4  = 41$	$ R_2 - R_5  = 36$	$ R_3 - R_4  = 12$
$ R_3 - R_5  = 3$	$ R_4 - R_5  = 15$		
	{ T1 Dual Agent T4 *Seller Agent T3 Mediator T5 Buyer Agent T2 Middleman		
Classroom			
$ R_1 - R_2  = 114^*$	$ R_1 - R_3  = 71^*$	$ R_1 - R_4  = 111^*$	$ R_1 - R_5  = 54$
$ R_2 - R_3  = 43$	$ R_2 - R_4  = 3$	$ R_2 - R_5  = 60$	$ R_3 - R_4  = 40$
$ R_3 - R_5  = 17$	$ R_4 - R_5  = 57$		
	{ T1 Dual Agent T5 Buyer Agent T3 Mediator T4 *Seller Agent T2 Middleman		

over the other alternatives. In fact, the conventional model falls into the less-preferred group for both samples. The model most preferred is that of dual agency. It stands apart from the remainder in the mail sample and shares preferred status with only the buyer agency model in the classroom sample.

### *Comments*

Most who had comments criticized the conventional model of exclusive seller representation. Also, the misconception that the salesperson must represent the one who pays the commission is prevalent [11]. Some comments that illustrate these views follow.

I try to be a channel whereby both parties will ultimately feel the transaction has been mutually successful—for myself also. We presently disclose that we represent the seller.

Intellectually I work for the seller; emotionally and practically I do what is best and fair for all parties. What is said to me in confidence is never repeated regardless of fiduciary relationships. I treat everyone the same. It seems to be less risky that way.

An agent often develops a closer personal working relationship with buyers and therefore must keep in mind that the seller is paying the commission and is due the agent's loyalty.

When a buyer comes to me and details his housing needs, I try to find him a "good deal" in terms of underpriced housing. However, I never negotiate for them unless they are willing to pay the commission and hire me as his agent (this has not happened). I do see problems with being a member of MLS and being a buyer's agent.

In none of my sales was I paid by the purchaser; therefore I have always represented the seller.

More respect and legal attention needs to be paid to purchasers. Our present agency rules are archaic. I would like to work for a firm that represents buyers should a legal change be made.

In a small town we try to work out the best terms and price for everyone involved.

It's very important to me to help my buyers find the best deal for them but it's also just as important for my sellers to have their best deal. There is a huge gray area here that I feel caught up in most times.

Too often the selling agent unconsciously acts as buyer's agent for a quick commission and forgets he is the seller's agent. He may misrepresent things to the seller.

I develop close relationships with the majority of my buyers so the question of "working for" the seller rarely comes up even though I always try to get the seller the fairest price for his home.

The agent actually represents the buyer, not the seller!

I believe agents work for both buyer and seller. After all, the buyer will some day become a seller. I treat both buyers and sellers as though a future sale depends on it.

## Conclusion

Popular wisdom is premised on the paradigm that in conventional residential real estate brokerage, all practitioners are exclusive agents of all sellers and must therefore act in the best interests of sellers and not buyers (except for the common law duty to disclose material facts to buyers). Since licensees are taught this model in their coursework, it is presumed that they understand the model and practice accordingly. Since consumers were shown to be unaware of this model, the popular solution is simply to mandate disclosure of representation to all parties in a transaction.

Instead of accepting the notion that the residential real estate marketplace is comprised of many ignorant consumers and duplicitous agents, an alternative conclusion can be drawn from studies of real estate buyers and sellers—seller agency is simplistic in modeling the role of real estate agents in residential sales. The present study further supports this alternative.

The responses to the survey of Georgia licensees indicate that real estate licensees perceive that (a) buyers are loyal to the selling agent, (b) sellers often withhold confidential price information from listing agents, (c) listing agents and selling agents often do not share confidential price information with each other in a co-op, (d) listing agents often do not inform sellers of buyers' confidences, (e) buyers often repose with and receive from selling agents confidential information, and (f) the statement of the five given in the questionnaire which best reflects the role of the selling agent is the one that describes a dual agent (or, arguably, mediator):

Having the best knowledge of what the property is worth, the selling agent promotes a sale at what the agent considers to be fair in price and terms so that both the buyer and seller end up with a good deal.

It is now evident why consumers, at least in Georgia, do not realize the roles of the agents in a co-op sale are that of exclusive agents/subagents of sellers—it is not realized by the practitioners themselves!

To help relieve the residential brokerage industry of the frustrations it is experiencing in trying to conform to a simplistic model for representation, more research is needed to (a) develop representation models in addition to those found in the courts, (b) scrutinize legal liabilities and incentive structures within the models, and (c) design listing, disclosure, and multiple listing service agreements necessary to implement an alternative model.

## Notes

<sup>1</sup>Among the techniques employed were (a) a cover letter designed to create rapport with respondents printed and each signed by hand; (b) a one-and-a-half-page questionnaire printed on blue paper and offset in such a way as to make the form seem less concentrated than its typewritten counterpart; and (c) each envelope addressed by hand and sent to each respondent's home address with a postage-paid return envelope enclosed.

<sup>2</sup>Copies of the questionnaire and data details are available from the first author upon request.

<sup>3</sup>The null hypothesis that no differences in response to an item arise from a particular business attribute was tested by

$$X^2 = \sum \sum \frac{(O_{ij} - E_{ij})^2}{E_{ij}} \quad (1)$$

where  $O_{ij}$  = observed number of cases categorized in row  $i$  column  $j$

$E_{ij}$  = number of cases expected under  $H_0$  to be categorized in row  $i$  of column  $j$ .

<sup>4</sup>This result, though welcomed for reasons mentioned above and in note 5, was not entirely expected. For example, brokers may differ from salespersons in their perceptions of the listing agent's role stemming from differing experiences in actual negotiations or from sensitivity to the "proper" role found in the conventional model. However, more data are needed to increase responses in some subgroups, e.g., buyer representatives, before using these results for further examination of possible differences among subgroups.

<sup>5</sup>Since, for example, the salesperson subgroup is overrepresented in the classroom sample, the concern for subgroup bias in this sample is ameliorated when the more representative proportions of the mail sample indicate no differences exist based on this attribute. This unique sampling scheme, therefore, uses the mail sample to check for subgroup bias in the classroom sample and if, as here, no subgroup bias is found, the classroom sample is then used to check for response rate bias of the mail sample. It cannot be said with absolute certainty, however, that no response rate bias exists because the characteristics examined (though perhaps most significant) are not exhaustive.

<sup>6</sup>Friedman's statistic for comparing rank sums is as follows:

$$F_r = \frac{12}{bk(k+1)} \sum (R_j)^2 - 3b(k+1) \quad (2)$$

where:

$b$  = number of rows (respondents)

$k$  = number of columns (statements)

$R_j$  = sum of ranks of  $j$ th column

<sup>7</sup>Decide

$$T_u \neq T_v \text{ if } |R_u - R_v| \geq q(\alpha, k, \omega) \left[ \frac{n(k)(k+1)}{12} \right]^{1/2}$$

where:

$T_u$  = treatment (statement)  $u$

$R_u$  = sum of the ranks for treatment  $u$

$q(\alpha, k, \omega)$  = upper  $\alpha$  percentile point of range of  $k$  independent  $N(0,1)$  variables.

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