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# Relative level of occurrence of the principal heuristics in Nigeria property valuation

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## Abstract

The neglect of the other principal heuristics namely availability, representative and positivity in real estate behavioural property research as against the exclusive focus on anchoring and adjustment heuristics invariably results to a lopsided research. This work studied the four principal heuristics in property behavioural property valuation in a bid to discovering its relative level of occurrence. The study adopted a cross-sectional questionnaire survey approach of 159 of the 270 Head Offices of Estate Surveying and Valuation firms in Lagos Metropolis, while 29 and 30 questionnaire were distributed to the Head Offices of the entire Estate Surveying and Valuation Firms in Abuja and Port-Harcourt respectively. The data gotten was analyzed with the aid of Statistical Package for the Social Sciences first using frequency distributions/means and the data so analyzed was further analyzed using maximum and minimum values, means/standard deviations and ultimately ranking of such means. The result revealed that respondents use the various principal heuristics in this decreasing order of magnitude: availability heuristics (26.77%), anchoring and adjustment heuristics (18.62%); representative heuristics (15.63%) and least of all positivity heuristics (10.41%). The authors thereby opined that emphasis be placed more on availability heuristics research particularly as usage of heuristics (anchoring and adjustment) has been seen to influence valuation inconsistency/accuracy.

**Keywords:** Principal heuristics, Behavioural research, Property, Valuation, Nigeria

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## **1. Introduction**

Heuristics is the use of simplifying shortcuts or rules of thumb by humans in solving complex problems. This in essence is as a result of the limited storage capacity of the short-term memory function (which is the focus of problem solving in humans) and slow and tedious indexing system of the long-term memory. Heuristics, a topic in the behavioural sciences, tends to influx real estate research particularly valuation as choices of alternatives is involved (Diaz, 2002).

The adoption of behavioural research has expanded the traditional boundaries of real estate research. The real estate discipline has therefore become more collaborative and more interlinked into some other fields of knowledge, notably psychology. Hitherto, the boundaries of real estate though were limited to traditional cognate boundaries confined to finance, (particularly in the United States), the built environment (particularly in the United Kingdom) and other related disciplines such as economics, marketing, management, law, engineering/construction, planning and architecture (Black et al., 2003). The frontiers of these traditional boundaries have now been extended (in behavioural research) to cognitive psychology.

Behavioural research in real estate particularly property valuation is increasingly topical because of the perception that valuation, like every other professional judgment, is subject to decision-making processes and human behavioural traits. Decision-making is based on human information processing which is believed to be less than rational/optimal. Early works by Newell and Simon (1972) and Simon (1978) describe the basis for such sub optimality: human problem solving involves interaction among the human information processing system, the task environment (the problem to be solved), and the problem space (the manner in which the problem solver perceives the task environment). A problem solver must accordingly understand the limitations these interactions place on problems to be solved as well as on methods for solution. Behavioral limitations in the processing of information form a useful premise in cognitive psychology which can assist in understanding problems in real estate valuation.

Over the years the behavioural research into valuation has developed along four lines of inquiry: Departures from normative models (Diaz, 1990a; Adair, Berry and McGreal, 1996; Diaz, Gallimore and Levy, 2004); Comparable sales selection (Diaz, 1990b; Wolverton, 1996; Gallimore and Wolverton, 1997); Valuation biases (Gallimore, 1994; Gallimore, 1996; Diaz and Hansz, 1997; Diaz and Wolverton, 1998; Havard, 1999; Diaz, 1997; Diaz and Hansz, 2001; Cypher and Hansz, 2003; Hansz, 2004a); and Agency-related impacts or feedback (Kinnard et al. 1997; Wolverton and Gallimore, 1999; Levy and Schuck, 1999; Gallimore and Wolverton, 2000). Further highlights will be narrowed down to one of these four categories of real estate behavioural research highlighted above, namely, bias in valuation judgment, under which heuristics is studied, since this is the central focus of this study's objective.

The discovery of these heuristics can be traceable to Tversky and Kahnemann (1974) who identified three: the representative heuristic the availability heuristic, and the anchoring and adjustment heuristic. Evans (1989) later added a fourth: the positivity heuristic (other heuristics have subsequently been identified, but these are generally considered to be lesser heuristics). Hence, the four mentioned above are accordingly regarded as the four principal types of heuristics, and these are explained by Havard (2001) as follows: The availability heuristic is a shortcut formed based on the experience which the decision maker has

had in the past with the type of problem or situation at hand. An apparently successful strategy or solution of the problem means that tasks will tend to be perceived in a certain way once essential components have been recognized. Once this behaviour has been learned, it is very hard to alter. Data collection tends to be based on ease of retrieval, meaning that the decision maker will choose the most recent information or the information most easily recalled or obtained. The representative heuristic on the other hand is similar to stereotyping. A decision-maker classifies an event or object with others of a type that they are familiar with. Lessons are learned from experience and assumptions are made that the subject in a task is the same as that seen elsewhere. The third heuristic, the anchoring and adjustment heuristic came out of the observation that decision-makers tend to solve problems by forming a-priori estimates of what the answer might be. Mussweiler (2002) described anchoring as the assimilation of a numeric estimate towards a previously considered standard. This initial estimate is adjusted as more information is obtained until a final solution is reached. In other words, anchoring occurs when a person picks an initial starting point (such as value) as a reference point which may be given, estimated, or implied and then proceeds to use this information as the basis of evaluating a given option or course of action. Adjustment occurs when the person takes this initial reference point and proceeds with the tweaking of such value based on an estimate of probabilities of potential results. The fourth heuristic, the positivity heuristic, was identified when Evans (1989) noted that humans have a fundamental tendency to seek information consistent with their current beliefs and avoid the collection of potentially falsifying evidence. They adopt strategies that are designed to confirm rather than refute beliefs. In this regard he suggested that humans look for ways of confirming their individual perceptions of the world.

Heuristics has since been applied in various facet of life, real estate inclusive. The first behavioural anchoring study on real estate focused on real estate brokers, though further research invariably centered on valuation. The initial behavioural anchoring study was Northcraft and Neale (1987) who experimentally investigated the anchoring behaviour of real estate brokers on property pricing decisions. The authors found persistent anchoring to asking price in their estimates. Black and Diaz (1996), Black (1997) and Diaz et al. (1999) further pursued this point and showed significant anchoring to actual asking price. Some other researchers have also shown asking price to be a powerful anchor (Rabianski, 1992; White et al, 1994; Blount et al. 1996), though Diekmann et al (1996) showed that initial purchase price was another powerful anchor. Gallimore (1994, 1996), Gallimore and Wolverson (1997), Gallimore et al. (2000), and Gallimore and Gray (2002) revealed that valuers anchor on factors such as commentators' views, most recent information, pending sales price, previous transaction price, respectively.

In property valuation research, Gallimore (1994, 1996) conducted some experimental work into valuation processes, among valuers in the UK. His study conducted a series of experiments to examine the effect of anchoring and confirmation bias on valuations and he concluded that there is sufficient evidence of such bias especially in unfamiliar locations. Harvard (1999) conducted similar experiments on valuers in the UK and also found that an anchoring and adjustments heuristic strategy is adopted by valuers in unfamiliar locations. His finding is similar to the findings in Hong Kong (Wong, 2006). Other studies carried out to identify the existence of and nature of anchoring and adjustment heuristics in the valuation process include (Cho and Megbolugbe, 1996; Diaz, 1997; Diaz and Hansz, 1997, 2001; Hamilton and Clayton, 1999; Harvard, 1999,

2001; Clayton et al. 2001; Hansz and Diaz 2001; Gallimore and Gray 2002; Cypher and Hansz, 2003; Hansz, 2004a; 2004b). These studies confirmed the existence of anchoring and adjustment heuristics (with the exception of Diaz, 1997).

In Nigeria research in Anchoring and Adjustment Heuristics though in its infancy has likewise been carried out. Adegoke and Aluko (2007) studied the occurrence of anchoring and adjustment in the valuation of commercial properties. Their study surveyed one hundred and twenty-two (122) Estate Surveying and Valuation firms in Lagos metropolis. The findings revealed that Estate Surveyors and Valuers used anchoring and adjustment heuristic behavior in forming initial judgements about valuation tasks. A latter work in Nigeria by Adegoke (2008) sought to examine whether the use of anchoring and adjustment heuristics varied according to valuer familiarity with the location of valuation assignments. He employed a similar methodology as the earlier Adegoke and Aluko (2007) study and found that that this type of heuristic was predominant in unfamiliar location of operation. In a bid to examining the continuous problems of non-reliability, inconsistency and irrationality in Nigerian Valuation practice, Ogunba and Ojo (2007) envisaged the usage of anchoring and adjustment as a trigger; this was pointed out earlier in Adegoke (2006). Adegoke et al. (2012), in a study involving both quasi-experimental and the survey methods of One hundred and twenty two (122) estate surveying and valuation firms in Lagos Metropolis, revealed that valuers do anchor during a valuation task and that this initial judgement came from valuer's knowledge and experience. It was showed that the initial judgement was a strong determinant of the valuation outcome in that adjustment by valuers to the initial value judgement tended to be insufficient as new evidence is presented.

However, apart from Iroham (2012) who undertook a study in Nigeria to merely discover the existence of the three other principal heuristic in property valuation practice, all other property valuation research on heuristics has been confined to anchoring and adjustment heuristics. Unquestionably, the exclusive focus on anchoring and adjustment heuristics creates a decisively skewed research focus and leaves an unacceptable dearth in property valuation literature and policy formulation. Since, from the prologue it can be deduced that actual valuation behavior must be understood before valuation improvement can be engineered, this research intends to discover the relative level of occurrence of these principal heuristics in Nigeria property valuation so as to direct aright the focus of further behavioural research particularly as heuristics (anchoring and adjustment) has been discovered to cause bias in property valuation outcomes (Gallimore, 1994; Gallimore, 1996; Diaz and Hansz, 1997; Diaz and Wolverton, 1998; Diaz, 1997; Havard, 1999; Diaz and Hansz, 2001; Cypher and Hansz, 2003; Hansz, 2004a).

## **2. Research method**

This is a cross-sectional research that entailed the survey of 159 out of the 270 Head Offices of Estate Surveying Firms in Lagos Metropolis, the entire 29 and 39 Head Offices of Estate Surveying Firms in Abuja and Port-Harcourt respectively. The findings of an empirical research work are only considered representative of the entire study population where there is an adequate survey size. Hence, there was a need to capture a sufficiently ample sample size which could be taken as representative of the study

population. The appropriate sample size from the sample frame of 270 firms in Lagos Metropolis was derived by resort to a demographic formula usually adopted for determination of sample sizes (see for example Otte, 2006) as follows:

$$N = P (100-P) \times Z/D^2 \dots\dots\dots \text{Equ (1)}$$

where:

N = required sample size

P = anticipated prevalence

D = allowable error estimate (desired precision)

Z = appropriate value (standard value) from the normal distribution for the desired confidence level

However, where the sample size derived is quite large, a readjustment is deduced as follow:

$$N' = N / (1 + N/T) \dots\dots\dots \text{Equ (2)}$$

where:

N' = adjusted sample size

N = previous sample size

T = total population

The research anticipated a minimum response rate of 50%, an allowable error estimate of within  $\pm 5\%$  of the true prevalence and a desired confidence of 95%. Accordingly, the following deductions are made:

$$50 (100-50) \times (1.96^2 / 5^2) = 384.16$$

Following readjustment:

$$384.16 / (1 + (384.16/270)) = 158.56$$

This is approximately equal to 159.

Thus, it was decided that a total of 159 firms would form the sample size of the valuation firms to be studied in Lagos Metropolis. This represents about 58.9% of the sample frame.

With regard to the method of sampling for Lagos Metropolis, the researcher considered it useful to adopt random sampling so as to avoid any form of sampling prejudice that could potentially mar the objectivity and conclusive findings of the research. However, the random selections were undertaken within a stratified sampling framework, following the stratification in earlier accuracy studies (Ogunba, 1997; Ogunba and Ajayi, 1998; Iroham, 2007), namely: Lagos Island, Victoria Island, Ikoyi Island, Apapa Island, Surulere and Ikeja business districts. The number of firms randomly selected within each stratum was in proportion to the number in the total population (that is, about 59% in each stratum).

From the current Directory of the Nigerian Institution of Estate Surveyors and Valuers (2009), a total of 29 and 39 Estate Surveying firms are located in Abuja and Port-Harcourt respectively. In this regard, the researcher reflected on the observations of Denscombe (2003) that for a population of less than 30 people, a total enumeration survey (census) rather than a sample should be considered. Accordingly, and upon reflection, the decision was that a total enumeration survey of all the estate surveying firms in both Abuja and Port Harcourt would be carried out.

The choice of the three towns in Nigeria is due to its major and active valuation operations being carried. Questionnaire administered in the form of conducting interview was adopted as the primary data collection technique. The data collected required ranking of the usage of the four heuristics. Data was measured using ratio scales, that is, measuring how often out of 20 valuations each heuristic was used. Such data was analyzed with the aid of Statistical Package for the Social Sciences (SPSS Software) first using frequency distributions/means and the data so analyzed was further analyzed using maximum and minimum values, means/standard deviations and ultimately ranking of such means.

### 3. Data analysis and discussion

The field survey spanned a period of about eight months, precisely between the months of October 2011 and June 2012. Out of the 159 questionnaires administered to the head offices of Estate Surveying firms in Lagos Metropolis, a response rate of 74.84% was achieved, that is, 119 questionnaires duly filled and returned. For Head Offices of Estate Surveying firms in Abuja, a response rate of 86.21% (25 questionnaires) was achieved. Port-Harcourt area also recorded an encouraging response rate of 76.67% (23 questionnaires). This resulted to a cumulative response rate of 76.61% (167 questionnaires returned out of a total of 218 distributed). The researchers considered the response rate quite substantial for a conclusive result.

In the three study areas, Lagos, Abuja and Port-Harcourt, majority of the respondents (about 53%) fall within the age bracket of 31-40 years. This is perhaps due to the fact that the age bracket can be regarded as the most active in business. The highest academic qualification for most respondents in the three towns of study is the Bachelor of Science (B.Sc) degree (about 50%) as against the Higher National Diploma and other research degrees. This is enough for acquiring the basic professional qualification, for practice in Nigeria, of Associate membership of the Nigerian Institution of Estate Surveyors and Valuers (NIESV) of which majority of the respondents (about 87%), irrespective of the city in focus, have attained.

To address the issue raised in this research, respondents were asked to rate how many of every typical 20 valuations they have carried out:

- (a) That they had access to previously conducted valuations for the same or a very similar property that they adjusted to derive the value for the present valuation (in other words the frequency of use of anchoring and adjustment).

- (b) That they valued stereotype buildings ignoring differences in building features of comparable stereotype buildings in arriving at value (that is, the frequency of their use of representative heuristics).
- (c) That they made use of easily available rules of thumb rates for outgoings, rental evidence and yield, etc rather than freshly determined market rates (that is to say the frequency of use of availability heuristics).
- (d) That they justified and adopted their preconceived ideas of what the property value was, ignoring later market based market evidence and calculations (that is, use of positivity heuristics)

Table 1 provides the responses on the above four questions – the frequency of typical usage of each heuristic within a total of 20 valuations.

**Table 1.** Rate of Occurrence of the Four Heuristics in Typical 20 Valuations

Number of Supposed Valuations in 20 outcomes	Rating of typical occurrence of Anchoring and adjustment by respondents	Rating of typical occurrence of Availability heuristics by respondents	Rating of typical occurrence of Representative heuristics by respondents	Rating of typical occurrence of Positivity heuristics by respondents
0	25	20	24	39
1	9	4	17	9
2	14	6	11	16
3	12	7	8	10
4	7	3	7	9
5	19	9	20	17
6	2	5	3	2
7	1	4	3	4
8	6	6	3	0
9	1	0	2	0
10	13	15	13	3
11	2	1	1	0
12	1	5	0	0
13	0	2	1	1
14	0	4	0	0
15	4	9	4	0
16	1	4	0	0
17	0	0	0	0
18	5	4	2	3
19	0	0	0	0
20	1	6	0	1
Total	123	114	119	114

Table 1 reveals that out of 167 respondents 123, 114, 119 and 114 respondents answered the questions relating to anchoring and adjustment, availability, representative and positive heuristics respectively. From the frequency table, the relative occurrence of each heuristic was deduced in Table 2.

**Table 2.** Relative Level of Occurrence of Various Heuristics

Heuristics (a)	N (b)	Minimum (c)	Maximum (d)	Mean (e)	Std. Deviation (f)	Relative level of occurrence (g)	Rank (h)
Anchoring	123	.00	20.00	5.0569	5.01032	18.62%	2
Representative	119	.00	18.00	4.3866	4.32005	15.63%	3
Availability	114	.00	20.00	7.8421	6.18388	26.77%	1
Positivity	114	.00	20.00	3.0614	3.96061	10.41%	4

The relative level of occurrence (g) was obtained as follows:

$$g = ((e \times b) / 167) / 20 \times 100 \dots \dots \dots \text{Equ 3}$$

From Table 2 we observe that in the three study areas, respondents use more of availability heuristics (this has the largest level of occurrence of 26.77%), followed by anchoring and adjustment heuristics (18.62%); representative heuristics (15.63%) and least of all positivity heuristics (10.41%).

From the result it can be deduced that the most frequent usage of availability heuristics is due to the ease in assessing most used available rules of thumb rates for outgoings, rental evidence and yield. The determination of market rates for these parameters appears to be a herculean task. The usage of anchoring and adjustment appears next. This can be attributed to the fact that figures representing values are solely used. Such values can be easily gotten from enquiries from colleagues or access to past valuation reports. Positivity heuristics being the least frequent in occurrence is justifiable considering the fact that preconceived ideas of what the property value would be cannot be avowed considering the volatility of the property market.

**4. Concluding remark**

Availability heuristics was seen to be the most often used heuristic, followed by anchoring and adjustment heuristics and then representative heuristics and lastly, positivity heuristics. This result was considered important because it showed the relative occurrence of various heuristics in Nigeria property valuation thereby pointing to where the majority of corrective action should be devoted. It also demonstrated that the 100 per cent focus devoted by previous heuristic research to anchoring and adjustment Heuristics was majoring on the minor. The implication seen in this regard was that future research would need to give more emphasis on availability heuristics as the most frequently occurring heuristic. Such research can be hinged on its effect on valuation accuracy since usage of anchoring and adjustment which is a lesser use heuristics in Nigeria has been associated with inaccuracy in valuation. Researchers in behavioural property valuation in



other parts of the world can also carry out research in determining the relatively frequency of occurrence of the various heuristics and also its effects on property valuation. The time to stop the usage of heuristics is now particularly availability heuristics if research has established its adverse effect just as evidence in anchoring and adjustment heuristics. This is considering the fact that the relative usage is still meagre with the highest being (26.77%) before an escalation occurs.

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