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Research bias in judgement bias studies – a systematic review of valuation judgement literature

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ABSTRACT

Valuation judgement bias has been a research topic for several years due to its proclaimed effect on valuation accuracy. However, little is known on the emphasis of literature on judgement bias, with regard to, for instance, research methodologies, research context and robustness of research evidence. A synthesis of available research will establish consistency in the current knowledge base on valuer judgement, identify future research opportunities and support decision-making policy by educational and regulatory stakeholders how to cope with judgement bias. This article therefore, provides a systematic review of empirical research on real estate valuer judgement over the last 30 years. Based on a number of inclusion and exclusion criteria, we have systematically analysed 32 relevant papers on valuation judgement bias. Although we find some consistency in evidence, we also find the underlying research to be biased; the methodology adopted is dominated by a quantitative approach; research context is skewed by timing and origination; and research evidence seems fragmented and needs replication. In order to obtain a deeper understanding of valuation judgement processes and thus extend the current knowledge base, we advocate more use of qualitative research methods and scholars to adopt an interpretative paradigm when studying judgement behaviour.

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1. Introduction

Judgement bias has been a behavioural research topic in real estate valuation for many years. As in many economic domains, behavioural research erupted in real estate valuation research, since the early 1990s onwards as a counterpart to the more traditional finance approach that has long dominated the research agenda of scholars.[1] Grounded in cognitive psychology, behavioural research seems well positioned to contribute to the development of a better understanding of valuer judgement and decision-making processes (Diaz, 1999). However, little is known on the emphasis of the research undertaken. Although Diaz (1999),

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Diaz and Hansz (2007) and Wyman, Seldin, and Worzala (2011) have provided partial overviews of behavioural studies and the behavioural paradigm in valuation, to our knowledge no systematic review of empirical studies on valuer judgement behaviour has been conducted over the last 30 years.

A systematic review is a high-level overview of primary research on a particular research issue, in order to synthesise all research evidence deemed relevant (Petticrew & Roberts, 2006). As such, it can provide the evidence to support decision-making policy as they establish consistency between research papers, or point out whether findings substantially differ by subsets (Mulrow, 1994).

This article seeks to explore what we have learned on valuer judgement bias, due to its relevance in view of valuation accuracy. Accuracy in real estate valuation relies considerably on personal knowledge, expertise and interpretation of the many variables that exist (Hager & Lord, 1985; Lai & Wang, 1998; Quan & Quigley, 1991). The crisis in the commercial property market that started in 2007 led to a lot of criticism on the valuation process, suggesting that inaccurate valuation practices were a major contributing factor to the market collapse of mortgage backed finance activities (DeLisle & Grissom, 2011; Newell, Razali, & Juanil, 2010).

Furthermore, over the last 15 years a recurring theme from financial markets has been concerns over ethical standards of information intermediaries such as real estate valuers. Academic research on real estate valuers suggests that their advice may not always be independent of client attachment, which is exploited by valuation clients as mortgage banks and investors seek to 'protect' their monetary interests when issuing valuation assignments (Crosby, Devaney, Lizieri, & McAllister, 2015; Freidson, 2001).

The essence of both criticisms is related to the fact that real estate valuation is the product of an individual valuer's professional judgement (Gallimore, 1996). No matter how carefully produced, such opinions are based on imperfect market conditions due to real estate's product heterogeneity and a lack of a central market place. This 'fact of life' in real estate valuation creates input uncertainty due to data deficiencies as well as client influence which valuers have to cope with in valuation practice (Crosby et al., 2015; French, 2011). To address this criticism, professional real estate bodies, such as the Royal Institution of Chartered Surveyors (RICS) have put considerable effort into improving valuation process quality and reducing valuer uncertainty (i.e. Mallinson Report in 1994 and Carsberg report in 2002) (Crosby, Newell, Matysiak, French, & Rodney, 1997; Crosby et al., 2015). Many of these initiatives involved updating and harmonising valuation standards and procedures (Crosby et al., 1997; Mallinson & French, 2000; McParland, Adair, & McGreal, 2002; Smolen, 1994). Since 2007, both the RICS red book on professional valuation standards (based on International Valuation Standards) and The European Group of Valuers' Associations (TEGoVA's) blue book (based on European Valuation Standards) have been updated and amended several times to reflect the newest standards and professional guidelines for instance on client interest protocols (RICS, 2017a; TEGoVA, 2016). Recently, the RICS joined a global coalition of real estate organisations that published a set of international ethical standards to reinforce professional ethics in the real estate industry (International Ethics Standards Coalition [IESC], 2016; RICS, 2017b).

As financial markets and products continue to evolve, adjusted valuation guidelines will undoubtedly follow. However, the underlying tendency towards development of the profession described here is an attempt to reinforce the system of valuation standards, protocols and guidelines whenever the reliability of the valuation is at stake. While this obviously seems sensible to some extent, Bakker and Montesano Montessori (2016) argue that such 'systems' will never be able to provide guidelines that cover all situations a professional will be faced with, especially in interactive work settings, such as professional-client relationships. Valuers, as well as other professionals whose daily work comprises several judgement tasks, will have to cope with unpredictable, non-routine and complex situations from time to time. Dealing with such situations also requires (the continuous development of) skills that relate to interpretation, assessment and judgement, to encourage conscious application of one's professional autonomy in order to make appropriate judgement calls regardless of the dynamics of the market environment. Yet for individual valuers to be (further) trained in their judgement skills, a thorough insight is required into current judgement behaviour. Such insight is gained through research and the compilation of a knowledge base, which is why it is important to review what is known on judgement behaviour. Apart from educational aims, a profound knowledge base can also aid to the further development of professional standards, to the extent that consistently observed behavioural patterns may instigate the further development of valuation guidelines.

This article therefore seeks to explore what we have learned on valuer judgement bias. This is established by means of a systematic review of empirical research in English language scientific journals on a global basis over the last 30 years. We examine both the extent to which judgement bias is found to be present in valuation practice as well as relevant research conditions. For instance, we wonder what type of judgement bias has consistently been appearing throughout the years, what research methodology prevails in judgement bias studies, and whether research settings are diversified by scope and origination. We therefore focus our review on relevant aspects relating to research methodology, research context and research significance. By doing so, we aim to establish a comprehensive overview of present knowledge on valuer behaviour and identify areas of future research, and hence contribute to a more profound body of knowledge on valuation behaviour.

In the following section, we start with the concept of professional autonomy, as this is the foundation for judgement behaviour and associated bias. Next, professional autonomy within the context of real estate valuation is explored. Subsequently the systematic review on valuer judgement bias is presented, analysed and discussed. We finalise this article with conclusions on the profundity of the current knowledge base and provide recommendations for future research on valuation behaviour.

2. Professional autonomy

Professional practice is usually regulated through legal standards and professionals' legitimate power to act in the affairs of clients. However, the real indicator of professional control is the extent of a professional's autonomy to exercise his judgement at his own discretion with regard to client servicing (Hall, 1968). Such autonomy, or discretionary power, often limits or rules out a proper check on the quality of service by clients, or even peers when operating in a one-on-one service structure. That is why every profession should have an ideology that explains why professional autonomy is not desired out of self-interest, but is a requirement for offering the best possible service in the public's or client's interest (Daniels, 1973). Such ideology is often stipulated in a professional code of ethics, which reflects the norms of behaviour that professionals should encounter in light of the profession's service ideal (Wilensky, 1964).

Since the 1980s, many professions have been stimulated to shift their practice standards from task-orientation to client-orientation and towards more 'accountability' of professional handling, due to increasing public sector privatisation and market competition that evolved in many western economies (Freidson, 2001). This trend is illustrated by a boost in guidelines, business protocols and other types of instruction that are designed to provide guidance for professional handling (Bakker & Montesano Montessori, 2016). Today, a growing number of professionals have witnessed a remodelling of their practice, as empowered clients co-designed parts of the professions input, throughput or output parts (Lengnick-Hall, 1996). By enforcing such a rebalance in professional autonomy, stakeholders attempt to monitor more closely professional practice and so avoid or resolve in an early stage any distractions from the profession's service ideology. The valuation practice seems no exception to this trend, as mortgage lenders rely on valuation reports to mitigate lending risk and to monitor loan covenants. Property valuation is an essential part of risk management in the banking sector (Crosby et al., 2015; Nwuba, Egwuatu, & Salawu, 2015a)

However, there may be two problems with this increasing focus on accountability. One problem is that such distracting behaviour is not so much caused by (deliberate) corruptive or fraudulent behaviour, but much rather the result of unconscious judgement bias, for instance, related to information ambiguity. Unconscious judgement bias cannot easily be deterred by prescriptive protocols or punishment, but requires awareness stimuli by training and education (Bakker & Montesano Montessori, 2016). The other problem is related to potential client influence bias. Clients have their own interests and customer economic behaviour is often driven by monetary and time-efficient motives (Freidson, 2001). (Further) empowerment of clients may result in suboptimal decision-making due to an overemphasis on client-driven efficiency. To overcome bias related to subconscious decision-making or client influence, professionals require certain judgement skills to carefully identify non-routine situations, interpret potential contradictory interests at stake and assess alternative acting consequences in order to arrive at an accurate decision. This focus on individual judgement skills is also referred to as the moral level of professionalism and involves using Schön's (1983) notion of reflective skills to connect between cognitive insights, organisational norms and one's own moral values in order to come to optimal decision-making (Kunneman, 2005). As such, it supplements the instrumental level of professional development, illustrated by instruments as practice guidelines and business protocols, which specify preferred behaviour in more routine business situations (Wassink & Bakker, 2013). Authentic professional growth obviously is aimed at finding a proper balance between instrumental and moral levels of development, or between (top-down implemented) practice guidelines and (bottom-up development of) judgement skill enhancement.

3. Professional autonomy in real estate valuation

Coping with uncertainty in valuation decision-making processes is often related to some sort of information ambiguity and lack of market transparency, which is caused by a heterogeneous product, absence of central trading market place and poor quality information sources (Hutchison & Nanthakumaran, 2000). Data deficiencies lead valuers to work with secondary and incomplete information (Adair, Hutchison, Burgess, & Roulac, 2005). While a valuer is educated and trained to conduct valuation analyses carefully, such data deficiencies create input uncertainty which may lead valuers to apply heuristic behaviour in their decision-making process. Available factual (but relevant?) information, such as previous value estimates or pending sale prices may act as reference points that may influence valuers in their current value estimates. This phenomenon is referred to as anchoring bias (Diaz, 1999; Gallimore, 1994). Anchoring bias occurs as the human brain seeks cognitive shortcuts (i.e. heuristics) to overcome the limited amount of short-term memory in light of information ambiguity (Diaz & Hansz, 1997).[2] Depending on the level of objective and factual information available to the valuer, individual valuers must rely to some extent on their own judgement skills and hence may (sub)consciously be exposed to heuristic bias in their value decision (Joslin, 2005). This may also be triggered by the fact that valuers operate in a fee-dominated business environment where timely delivery of valuation reports is of the essence (Worzala, Lenk, & Kinnard, 1998). For the purpose of this article, we refer to this phenomenon as *intrapersonal* judgement bias, as it is predominantly related to the human's cognitive information-processing capacity.

Another potential complicating factor in real estate valuation is client attachment. The relationship between valuer and client is perceived as being analogous to the agent-principal relationship, where a buyer, seller or loan originator (e.g. the principal) hires a valuer (i.e. the agent) to perform a valuation service on its behalf (Rudolph, 1998). Such principals have a strong interest in completion of a (finance) transaction. The valuer understands the financial implications of withdrawn transactions to clients and at the same time seeks a long-term business relation. This potentially creates a moral hazard issue for valuers with regard to deciding on an appropriate market value estimate (Cho & Megbolugbe, 1996; Kinnard, Lenk, & Worzala, 1997). In turn, the principal's awareness of this moral hazard issue opens the door for client influence. A suggestion by a large valuation client to reconsider an estimated value can pressure a valuer to use his discretionary power to prevail potential loss of revenue over principle (Smolen & Hambleton, 1997). The presence of such client influence has been confirmed using qualitative field studies and hedonic regression analyses (i.e. Crosby, Lizieri, & McAllister, 2010; Crosby et al., 1997, 2015; Levy & Schuck, 2005; and Smolen & Hambleton, 1997). Illustratively, Bretten and Wyatt (2001) provided indications of increasing client empowerment in the sector, raising their influence on various parts of the valuation process. Hence, client influence provides an additional complication for real estate valuers in their quest for correct value estimates. The effect of client influence here is referred to as *interpersonal* judgement bias, as client attachment may instigate suboptimal decision-making by valuers.

The above exemplifies the complexity of a valuer's business environment, aimed at decision-making processes while coping with information uncertainty and clients' interests, in which various elements for judgement bias seem present (i.e. input uncertainty, client-agent relationships and discretionary power). In order to explore to what extent such judgement bias is existing in real-life valuation practice, we need to examine available research on the subject, the results of which is illustrated hereafter.

4. Empirical evidence on real estate valuer judgement bias

4.1. Data search and analysis

To be able to provide a comprehensive overview of valuation judgement research performed so far, we have set up a systematic English language literature review using the following search methodology.

As a starting point, we examined theoretical papers on real estate (valuation) behaviour research as provided by DeLisle (1985), Diaz (1999), Diaz and Hansz (2007) and Wyman et al. (2011) to identify relevant papers on valuer judgement behaviour. Analogue to the technique of snowball sampling (Verschuren & Doorewaard, 2015) we applied author citation search to assemble other relevant studies in this area. This initial sample gave us a view of journals with an interest in publishing valuer judgement research. We expanded our data-set by an index search of relevant journals back to 1985, the year in which Hager and Lord published their influential paper on valuer idiosyncrasy in relation to accuracy. Finally, in order to prevent a narrow scope on certain journals, we performed an open access database search using Web of Science and Google Scholar to collect overlooked studies on valuation judgement behaviour. The above search methodology resulted in an initial database of 75 papers on valuation behaviour as illustrated below (Figure 1).[3]

Second, we used a number of exclusion criteria to narrow our preliminary data-set down to a final data-set of relevant studies for analysis purposes. It is important to note here that we focus on judgement behaviour of real estate valuers only, as we are particularly interested in how valuers use their professional autonomy in valuation practice. We have therefore excluded studies that either:

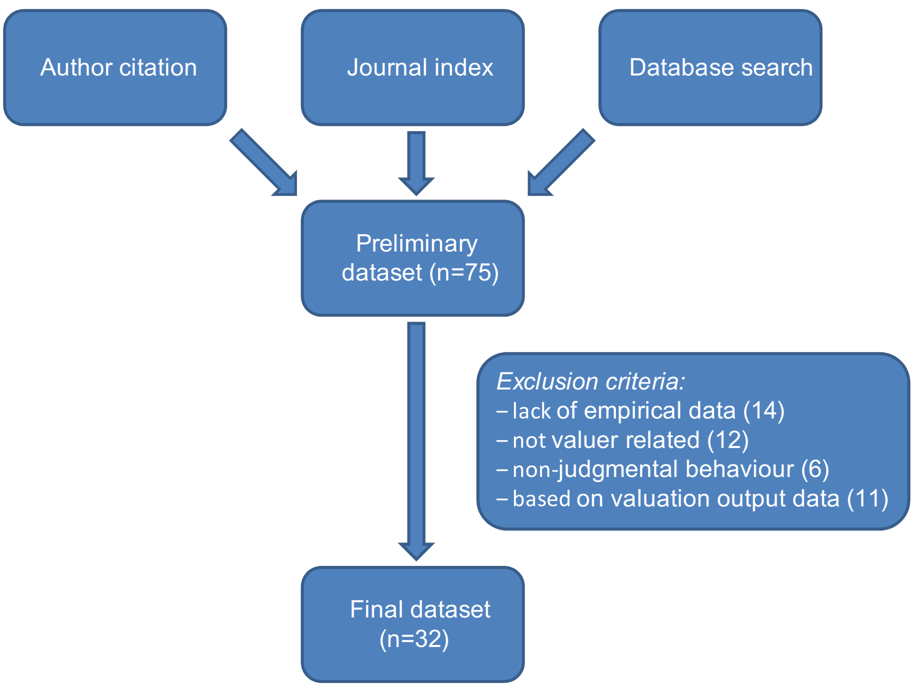

Figure 1. Data-set compilation.

- lack empirical data, such as theoretical papers and professional essays that provide theoretical views on valuation judgement (14 studies);
- focus on judgement behaviour of non-valuers, such as real estate agents, valuation clients or student valuers (12 studies);
- address non-judgemental valuation behaviour, such as ranking of property characteristics (six studies); or
- provide numerical performance analysis based on (year-end) valuation output data as a proxy for valuer behaviour (11 studies).

This resulted in a final database of 32 studies. Next, we grouped relevant studies based on the research angle applied. Following Gallimore and Wolverton (2000), valuer judgement bias is defined here as a deviation from prescribed information-processing valuation procedures. Based on examination of available studies, a distinction is made between two forms of valuer judgement studies:

(1) *Intrapersonal* valuer judgement studies, which tend to study intrapersonal decision-making in light of information processing, including the influence of certain reference points;
(2) *Interpersonal* valuer judgement studies, which are focused on the relationship between valuer and his client and address the effects of client influence on valuer decision-making processes.

Subsequently, we have labelled 17 studies of the final data-set as intrapersonal judgement bias-related, while the remaining 15 studies are primarily focused on interpersonal judgement bias. In addition to this intra/interpersonal judgement distinction, the final data-set has been classified employing the following criteria that are relevant for the purpose of qualitative content analysis (Hsieh & Shannon, 2005):

- Research methodology. Qualitative instruments, such as a case study or interview are presumably more effective for the study of individual thoughts or behaviour, which needs to be offset against the strength of anonymity provided in survey methods when researching delicate matters, as well as generalisation options of obtained results (Crosby et al., 2015; Gallimore, 1996; Levy & Schuck, 1999; McAllister, Baum, Crosby, Gallimore, & Gray, 2003);
- Research context. This includes timing and origination of field studies, as it is argued that a diversified set of underlying field research would contribute to the robustness of research evidence (Verschuren & Doorewaard, 2015). In addition, we explore the extent to which participating valuers have gained a specialisation in either residential or commercial valuation. Such specialisations may imply enhanced professional expertise, yet may also increase revenue dependence on a particular group of clients (Amidu, Aluko, & Hansz, 2008). Finally other contextual information is reviewed, such as the presence of particular research settings (i.e. mortgage case scenario) to study valuation judgement;
- Research significance. The extent to which results have shown to be significant (i.e. not due to chance) using statistical hypothesis testing and hence contributing to the robustness of research on valuer bias (Verschuren & Doorewaard, 2015).

4.2. Intrapersonal valuer judgement bias

Based on our analysis criteria, the following general comments are made upfront on the subset of 17 relevant studies on intrapersonal valuer judgement bias:

- Research methodology: most studies (15) have been generated using experimental settings either at location or through survey;
- Research context: 11 out of 17 associated field studies have been performed within a 10-year timeframe between 1995 and 2004 and an equal portion of studies on intrapersonal judgement bias are (partly) US-originated. Fourteen studies are performed in a commercial or residential subsector, implying a relatively homogenous field sample. Ten studies made use of an experimental design that involved working on a valuation assignment in a geographic unfamiliar area;
- Research significance: 11 studies found statistical significant proof of intrapersonal valuer judgement bias.

The evidence on intrapersonal valuer judgement bias can be broadly divided in studies on valuation process inconsistency (studies numbered 1–4 in Table 1) vs. heuristics-related bias studies (studies number 5–17).

With regard to valuation process inconsistency, Diaz (1990a, 1990b)) and Diaz, Gallimore, and Levy (2002, 2004) compared actual residential valuer behaviour against prescribed valuation process norms in an international setting and found that US residential valuers show significant deviations in valuation procedures, also in unfamiliar local market settings. UK residential valuers tend to follow prescribed processes as taught, although Gallimore found that UK general practice valuers who have transaction price knowledge significantly limit their search effort for comparable transactions to support their value estimate (Gallimore, 1996). New Zealand residential valuers show mixed results here. Unfortunately, our dataset did not include studies on valuation process inconsistencies in commercial settings specifically.

The issue of (non-)familiarity has also been addressed in many heuristic behaviour studies. Most research on heuristics is based on experiments that aim to identify differences in valuer behaviour between familiar and unfamiliar market settings. Such experiments have been replicated over time and in various modes. When confronted with unfamiliar settings, evidence of reference point anchoring by US commercial valuers is provided by Diaz and Hansz (1997, 1997), Hansz (2004b) and Tidwell and Gallimore (2014) using various reference points such as third-party value estimates, pending sales or mortgage amounts or recent transaction prices. Tax value assessments are however, not recognised by US commercial valuers as 'valid' reference points in unfamiliar settings (Cypher & Hansz, 2003). In addition, studies on heuristic behaviour by residential valuers provide evidence of transaction price anchoring in settings with geographic unfamiliarity by both US and UK residential valuers (Diaz & Wolverton, 1998; Gallimore & Wolverton, 1997).

However, when market unfamiliarity is not controlled for (i.e. studying valuers in their own market area), the proof of heuristics-related bias is rather limited and mixed. Diaz and Hansz (2010) find proof of anchoring by US residential valuers, while Diaz (1997) cannot find evidence of anchoring behaviour by US commercial valuers in a local market setting. In the UK, Gallimore (1994) finds evidence of recency heuristic behaviour by UK general practice valuers using a nationwide survey. In less mature real estate markets, such

Table 1. Empirical studies on intrapersonal valuer judgement bias.

	Author(s)	Type of bias	Research context	Field study	Specialisation
1	Diaz (1990a)	Valuation process inconsistency*	US experiment (geograph. unfamiliar)	1987	Residential
2	Diaz (1990b)	Valuation process inconsistency~	US experiment	1987	Residential
3	Diaz et al. (2002)	Valuation process inconsistency**	UK–NZ experiment (geograph. unfamiliar)	1998 (NZ) 1999–2000 (UK)	Residential
4	Diaz et al. (2004)	Valuation process inconsistency**	UK–NZ experiment (geograph. unfamiliar)	1998 (NZ) 1999–2000 (UK)	Residential
5	Gallimore (1994)	Recency heuristics*	UK survey experiment	N.A.	General practice
6	Gallimore (1996)	Anchoring and positivity heuristics*	UK survey questionnaire	1995	General practice
7	Diaz (1997)	Previous valuation anchoring**	US experiment	1993	Commercial
8	Diaz and Hansz (1997)	Previous valuation anchoring*	US survey experiment (geograph. unfamiliar)	1995–1996	Commercial
9	Gallimore and Wolverton (1997)	Sale price anchoring*	US–UK experiment (geograph. unfamiliar)	1995 (US)–1996 (UK)	Residential
10	Diaz and Wolverton (1998)	Previous value anchoring*	US experiment (geograph. unfamiliar)	1995–1996	Residential
11	Diaz and Hansz (2001)	Sale price/previous valuation anchoring *	US survey experiment (geograph. unfamiliar)	1995–1996	Commercial
12	McAllister et al. (2003)	Previous value anchoring~	UK case study interviews	1999–2000	Commercial
13	Cypher and Hansz (2003)	Tax value anchoring**	US survey experiment (geograph. unfamiliar)	2002–2003	Commercial
14	Hansz (2004b)	Transaction price anchoring*	US survey experiment (geograph. unfamiliar)	2002	Commercial
15	Diaz and Hansz (2010)	Mortgage loan anchoring*	US experiment	2003–2004	Residential
16	Tidwell and Gallimore (2014)	Previous value anchoring*	US experiment (geograph. unfamiliar)	2011	Commercial
17	Iroham et al. (2014)	Representativity and availability heuristics*	Nig. survey experiment	2011–2012	General practice

*Results are statistically significant at 0.05 significance level; **Results are not significant at 0.05; ~Significance not tested.

as Nigeria, Iroham, Ogunba, and Oloyede (2014) find significant proof that general practice valuers showed signs of representativeness heuristics (e.g. stereotyping behaviour) and availability heuristics (e.g. availability of previously successfully applied solutions) when operating in local market settings.

The above indicates that there is evidence of reference point anchoring in unfamiliar (US) market settings, albeit relatively few scholars have undertaken research on heuristic behaviour in familiar settings. In addition, there seems to be a mismatch in research contributions geographically, as evidence from (continental) Europe and other parts of the world seems lacking in comparison to US research efforts. Finally, we point out that the final data-set contains no studies on valuation process inconsistencies in commercial settings.

4.3. Interpersonal valuer judgement bias

Next, we turn to the 15 relevant studies on interpersonal valuer judgement bias. General comments on analysis criteria are as follows:

- Research methodology research: contrary to intrapersonal judgement studies, almost all studies on interpersonal bias are conducted by means of survey research, mostly structured as a questionnaire (nine out of 15);
- Research context: two-thirds of field studies relating to interpersonal judgement bias have been performed between 1996 and 2005. Most studies have been performed in the USA (seven) and Nigeria (five). However, the majority of studies on interpersonal judgement bias were performed using sample participants that can be characterised as general practice valuers (10), rather than specialised commercial (four) or residential (one) valuers;
- Research significance: half of the 14 relevant studies provided statistical significant proof of interpersonal valuer judgement bias.

Studies on interpersonal judgement bias can be split into two. A number of studies addresses role perception of valuers following client pressure (studies numbered 1–4 in Table 2), while the remainder (studies 5–15) focuses on dilemmas in terms of value revision pressure. The

Table 2. Empirical studies on interpersonal valuer judgement bias.

	Author(s)	Type of bias	Research context	Field study	Specialisation
1	Wolverton and Gallimore (1999)	Price validation*	US survey questionnaire (mortgage loan scenario)	1997	General practice
2	Wolverton (2000)	Price validation*	US survey questionnaire (mortgage loan scenario)	1997	General practice
3	Gallimore and Wolverton (2000)	Price validation**	UK survey questionnaire (mortgage loan scenario)	1997	General practice
4	Amidu et al. (2008)	Price validation**	Nig. survey questionnaire (mortgage loan scenario)	2005	General practice
5	Smolen and Hambleton (1997)	Value revision~	US survey questionnaire	N.A.	General practice
6	Kinnard et al. (1997)	Value revision*	US survey experiment	1996	Commercial
7	Worzala et al. (1998)	Value revision**	US survey experiment	1996	Residential
8	Levy and Schuck (1999)	Value revision~	NZ case study interviews	N.A.	Commercial
9	Hansz and Diaz (2001)	Value revision*	US experiment	1999	Commercial
10	Hansz (2004a)	Value revision*	US survey experiment (mortgage loan scenario)	2002	Commercial
11	Amidu and Aluko (2007a)	Value revision**	Nig. survey questionnaire	2005	General practice
12	Amidu and Aluko (2007b)	Value revision**	Nig. survey experiment	2005	General practice
13	Chen and Yu (2009)	Value revision*	Taiwan/Singap. survey questionnaire	N.A.	General practice
14	Nwuba et al. (2015a)	Value revision*	Nig. survey quest./focus group (mortgage loan scenario)	2012	General practice
15	Nwuba et al. (2015b)	Value revision~	Nig. survey quest./focus group (mortgage loan scenario)	2012	General practice

*Results are statistically significant at 0.05 significance level; **Results are not significant at 0.05; ~Significance not tested.

two angles may seem closely aligned, but the nuance relates to different levels of motivation. Following McClelland's motivation theory of the Iceberg model (1973), value revision may correspond to behavioural aspects that are visible to others, while role perception may be measured at a deeper (invisible) layer of personal values and attitudes, which are often the foundation for human behaviour that and hence more difficult to alter if desired.

Smolen and Hambleton (1997) were among the first to provide – anecdotal – evidence of valuation revision, as surveyed valuers stated that 82% of *peer* valuers would accommodate unrealistic client demands. Kinnard et al. (1997) and Worzala et al. (1998) compare actual value revision pressure between commercial and residential valuers and conclude that 32% of residential valuers and 41% of commercial valuers did revise their valuation estimates. Interestingly, while commercial valuers appear significantly influenced by client size in their revision decisions, residential valuers are not.

With regard to other value revision influencers, Levy and Schuck (1999) point out that in commercial settings, revision can be effectuated by clients using expertise and information power rather than economic power. Hansz and Diaz III (2001) and Hansz (2004a) add that critical feedback on previous value assignments trigger US commercial valuers to provide more positive value estimates in subsequent (but unrelated) valuations assignments. Client size, transaction-related valuation assignments and lack of market transparency may also instigate value revision by general practice valuers in less mature real estate markets, such as Singapore, Taiwan and Nigeria (Amidu & Aluko, 2007a; Nwuba, Egwuatu, & Salawu, 2015b; Nwuba et al., 2015a), albeit not the case in residential settings (Amidu & Tajudeen Aluko, 2007b).

Empirical evidence from US studies on price validation behaviour point out that a relationship may exist between the type of client feedback (positive or negative) and its effect on valuer's role perception: while positive reinforcement feedback triggers valuers to perceive themselves as providers of objective market value estimates, negative feedback stimulates price validation role perception (Wolverton, 2000; Wolverton & Gallimore, 1999). However, no such result is found outside the USA for UK or Nigerian valuers (Amidu et al., 2008; Gallimore & Wolverton, 2000).

In short, commercial valuers may be inclined to submit to revision pressure following exposure to different kinds of influencers. The provided evidence varies by research setting but remains limited in number. In the residential sector, our data-set included one study on client pressure bias, with no such proof provided. In addition, evidence on price validation behaviour in mature real estate markets (i.e. US, Western Europe and Australia) is either mixed or lacking.

5. Discussion of results

As this article concerns a review of empirical studies, we comment here on a number of noteworthy aspects from a research point of view, including research methodology, research context and result significance.

With respect to research methodology, we note apparent research preferences amongst scholars. Much of the intrapersonal judgement studies included are conducted by means of an experimental design first used by Diaz (1997) and Diaz and Hansz (1997). Their experiments typically measure the effect of a bias-triggering intervention (such as a fictive reference point or client request) on market value estimates produced by valuers who are divided into a treatment group and a control group. Similar experiments, either through a classroom setting or via survey, have been conducted by various scholars, including Diaz and Wolverton (1998), Cypher and Hansz (2003) and Amidu and Tajudeen Aluko (2007b). As such, experimental research has provided an important contribution to the progression of judgement bias research in its current stance. Its methodological attractiveness is explained by Diaz (1997), advocating its ability to control for extraneous variation, thereby allowing for (strong) significant results despite the participation of relatively few valuers.

In interpersonal studies, we have come across similar experimental design, as well as survey questionnaires, which are mostly used to collect self-perceptions of behaviour when confronted with for instance, client influence (see for instance, Wolverton & Gallimore, 1999; Gallimore & Wolverton, 2000; Amidu et al., 2008; Chen & Yu, 2009; Nwuba et al., 2015a, 2015b). In recognition of its key advantages of generating statistical significant results and granting anonymous participation in research of delicate matters such as value revision (Gallimore, 1996), we also point to the risk of respondent unwillingness or unconsciousness to provide genuine answers as may be opportune in judgement behaviour (De Lange, Schuman, & Montesano Montessori, 2016).

Although the dominating survey approach in judgement bias studies may generate quantifiable data by means of Likert-scale structured questions, it prevents in our view a deeper exploration of valuer habits and acting in relation to judgement bias, and so cannot create a comprehensive view on such behavioural aspects. Exceptions here are for instance, Levy and Schuck (1999) and McAllister et al. (2003). Levy and Schuck (1999) addressed the lack of a more holistic consideration in valuer judgement research some time ago, but their point still seems valid today. McAllister et al. (2003) explained that their motivation for a case based interview approach is based '… on a preconception that detailed knowledge of the research questions is situated with professionals and could be best accessed by personal interview or "close dialogue"' (p. 266).

The adopted approach of McAllister et al. (2003) and Levy and Schuck (1999) reflects aspects of an interpretative research paradigm. Scholars following this approach often favour a more interactive and qualitative method of data collection through either (narrative) interviews, observation, focus group discussions or a combination of the above. While such research can be time consuming, labour intensive and provides little means for statistical analysis, its ability to unlock individual judgement behaviour and perceptions could contribute to improving both internal and external validity as a result of higher construct validity (De Lange et al., 2016). Our review points out such qualitative methods are (strongly) underweighted so far, leading to concerns about the validity of research in terms of generating a profound understanding of the dynamics of valuation judgement in relation to both individual circumstances and personal motivation and beliefs.

With regard to the research context, we make a distinction between intrapersonal and interpersonal judgement studies. In intrapersonal studies, our review indicates a substantial number of (experimental) studies that made use of a research context in which valuers were asked to perform valuation services in geographic areas where they had not worked before and hence experienced geographic unfamiliarity. For the purpose of research quality, it has been argued that experiments with participants operating in unfamiliar areas would promote a certain 'level playing field', as differences in local market expertise can be controlled (Gallimore & Wolverton, 1997). In addition, it will increase valuation uncertainty and hence may trigger heuristic behaviour (Diaz & Hansz, 2001; Geltner, 1993). However, research findings may seem less valuable for the purpose of understanding real-life valuation behaviour, as clients base their choice of preferred valuers on local market expertise (apart from fee levels) to reduce valuation lead-time (Levy & Lee, 2009; Newell, 2004). While creating a level-playing field amongst participating valuers through stimulating geographic unfamiliarity may contribute to control over experimental settings and hence improve construct validity of results, this should be offset against a lower ecological validity of results (i.e. research settings do not sufficiently match real-life practice) and hence make generalisation less defensible (Araújo, Davids, & Passos, 2007).

In interpersonal bias studies, we note that a number of studies used a mortgage loan scenario for context purposes. While commercial interests are highly visible in a mortgage case scenario as both banks and real estate buyers have an interest in completing a finance transaction (Cho & Megbolugbe, 1996; Smolen & Hambleton, 1997), our review indicated mixed results on the effects of client pressure on valuation judgement upon finance transactions. Given the indispensable role of market valuation for mortgage lending activities, we consider additional research a necessity to stipulate more closely the effect of a mortgage loan scenario upon judgement bias.

Another interesting aspect to acknowledge in research context is the disparity in business environment between residential and commercial valuation practice, which is partly reflected in available research evidence. Diaz (1990a) points towards the more homogeneous product of residential real estate (i.e. reducing property-related uncertainty) and higher levels of market transparency (i.e. reducing market uncertainty) compared to commercial real estate. On the other hand, this leads to more standardisation and efficiency in residential valuation service compared to commercial valuation (Rudolph, 1994), and so commercial valuation arguably exposes valuers to different challenges compared to residential valuers with regard to business environment and process complexity. Our review indicates 19 out of 32 papers made use of either residential or commercial specialised valuers, the bulk of which relates to intrapersonal judgement bias. However, these 19 papers produce mixed results in terms of outcomes and/or statistical robustness. Appreciation of exactly how these fundamental differences between commercial and residential valuation settings affect the practice of cognitive shortcuts would require the instigation of additional research.

This brings us to the point of international comparison of applied research context. It should be noted that the presence of 'systematic' differences between countries may blur such international comparison of results on for instance, heuristic behaviour. Due to US federal and professional regulation, US valuers are usually provided with pending sale price information (Diaz, 1997) which may provide an opportunity for anchoring behaviour. These formal disclosure requirements are lacking in other markets such as the UK or New Zealand, although revealing pending transaction prices by clients seems common practice in UK valuation practice as well (Gallimore & Wolverton, 1997).

With regard to client pressure effects, a similar case can be made. The conducted review on interpersonal valuer judgement bias made clear that US-originated proof of client-related bias seem unconfirmed in other (western) markets, such as the UK. Amidu et al. (2008) suggests this lack of congruence between studies may again in part be explained by international differences in market dynamics, as UK valuers are less specialised and have a more diversified revenue base than their US peers do. UK valuers seem therefore less exposed to revenue loss in case of unwillingness to comply with client pressure. In addition, facilitating draft valuation meetings with clients is common practice in UK and NZ valuation, enabling a last-minute information transfer between parties, where this appears less usual for US valuers (Levy & Schuck, 2005; McAllister et al., 2003). The point that we would like to raise is that international results on inter/intrapersonal valuer judgement cannot easily be claimed to be present in home countries due to systematic, cultural or procedural differences between countries which may raise ecological validity issues.

As a final comment on research context, we would like point out that 5 of the 15 studies on interpersonal judgement bias are based on field data that have been used in other publications enlisted in Table 2 as well. Notwithstanding the fact that data samples may be advantageous for multiple research analyses, it does not add to the overall robustness of evidence on valuer judgement. Such 'sample recycling' seemed to occur to a much lesser extent in intrapersonal judgement studies in our data-set however.

With hindsight to the comments above on unilaterality of research methodology and external validity of research context, we have analysed all studies included in our database on result significance. In case of location familiarity, we found (marginal) evidence of heuristics in five studies on US, UK and Nigerian valuation behaviour. While the tendency in these studies is towards a presence of heuristics in valuation practice in general, the underlying evidence is fragmented.

In addition, we observe that the evidence obtained on client-related judgement bias indicates that commercial valuers seem affected by various client influencers. Clients defend their empowerment by suggesting that their input into the valuation process reflects their concern to ensure market transparency, consistency and accurate and realistic valuations (Levy & Schuck, 2005). This may seem quite reasonable given the far-reaching consequences of value estimates for clients once valuation reports are submitted, yet the extent and magnitude of client influence in residential and commercial practice may substantially differ by country and sector. In order to address the issue of client empowerment in full context, we would advocate a closer examination of the valuation process and complexity of decision-making in light of input uncertainty and client influence in both commercial and residential valuation practice in various markets.

6. Conclusions and recommendations

Real estate valuers often operate in a challenging business environment and perform decision-making processes in an information-rich setting and fee-dominated markets where timely delivery of valuation reports to clients is of the essence. Yet valuations represent individual estimates based on available facts and assumptions related to (uncertainty over) market conditions. Valuers therefore possess a certain level of professional autonomy to exercise their judgement on value estimation. However the dynamics in business environment, such as lack of a central market place and product heterogeneity makes such judgement susceptible to bias. Judgement bias can be broadly divided into behaviour related to coping with information ambiguity (intrapersonal bias) and client influence (interpersonal bias). As discussed, such bias is known to have an effect on valuation accuracy and as such may imply mortgage financing risks. Therefore, understanding of the dynamics in valuation behaviour is essential and should contribute to improve valuation accuracy by means of regulation and education.

Behavioural research was initiated in real estate valuation in the early 1990s, yet a systematic review of the empirical research conducted so far is lacking. Our aim was therefore to provide a thorough insight into the current knowledge base on valuer judgement bias from the perspective of valuation professionals and to shed light on what we know, and not know, on how valuers utilise their professional autonomy in the market value estimation process. Identification of potential research gaps through a systematic review of the current knowledge base may serve as guidance for future research activities and hence contribute to the knowledge base on valuation behaviour.

Based on a number of analysis criteria, we reviewed a data-set of 32 relevant studies on valuer judgement bias over the last 30 years. This data-set review led us to the following findings and conclusions with regard to research methodology, research context and research significance.

On research methodology, we note that practically all value judgement behaviour studies included in our database have been conducted by means of experimental design, survey questionnaires or a combination of both. In appreciation of the valuable and often quantifiable contributions provided and methodologic preference given the sensibility of issues as client attachment, we also point towards the underrepresentation of other methodology such as interviews, which have only occurred twice in our database of 32 papers.

With regard to research context, we have pointed out that field data of at least 21 studies in our review is gathered in a relatively short timeframe between 1995 and 2005. Furthermore, field data of 18 studies are (fully or partly) US originated. In addition, two-thirds of interpersonal judgement research used a mixed sample of general practice valuers in field studies, rather than sampling a homogeneous set of either residential or commercial valuers to appreciate differences in business setting and daily work complexity between the two subsectors. Finally, we point towards the dominance of geographic unfamiliar valuation experiments in intrapersonal judgement studies.

On research robustness, our review indicates some consistency in the provided evidence on valuer judgement bias. A little over half of all studies provided significant proof of judgement bias within real estate valuation, especially with regard to intrapersonal bias. Most noticeably, we point towards the considerable evidence of reference point anchoring, especially in unfamiliar (uncertain) market settings predominantly derived from US field studies. On interpersonal judgement bias, the somewhat fragmented evidence not only indicates that commercial valuers may be vulnerable to client pressure in various forms as is pointed out by various scholars before, but additionally such influence may instigate deeper motivational issues with regard to self-perception (i.e. price validation behaviour).

Based on the above analysis, we find the research undertaken to be relatively biased by both methodology and research settings. In our view, this represents an important reason why the available knowledge on valuer judgement behaviour is still rather unsubstantiated despite 30 years of research. We would like to point out that we have taken a stringent scope on data-set inclusion criteria, as we have only encountered studies that focus on valuer behaviour in relation to judgement-related bias. By doing so, we have disregarded studies on the subject of valuation behaviour that may provide meaningful contributions into the black box of valuation behaviour, yet stem from a different perspective (i.e. client/apprentice valuer behaviour or quantitative analysis studies based on year-end performance data) or that have not been published in English language scientific journals since 1985.

With hindsight to the above, our findings have several implications for judgement bias-related research.

First, in order to contribute to a methodologically balanced and diverse knowledge base, we would advocate future research to adopt an interpretative research philosophy on the subject, as accessing a professional's (sub)conscious knowledge on decision-making processes by means of dialogue would arguably lead to increased research construct validity and hence would help towards a deeper understanding of valuer judgement behaviour and motivation.

In addition, while it is recognised that an experimental research angle adds to creating a controlled environment and hence stimulates methodological construct validity, this should be offset against a lower ecological validity with respect to research implications in real-life valuation practice. Notwithstanding the important research contributions made so far to unravel heuristic behaviour, we would recommend forthcoming behavioural research on the matter to focus on studying valuers in their natural work environment (i.e. geographic familiar markets) in order to enhance the knowledge base on (intrapersonal) valuation behaviour to a more far-reaching level.

Third, the domination of both contextual aspects related to timing and origination could hamper external validity pleads of results in our view, as real estate markets vary substantially by country and real estate market conditions usually have cyclical patterns with boom and bust periods. Replication of behavioural studies in subsequent markets and market conditions seems necessary in order to understand a fuller spectrum of valuation behaviour in relation to changing market (and client) dynamics.

Finally, we believe that for the purpose of understanding valuer behaviour, which seems context driven quite often, the impact of future research can be more far-reaching if field studies would focus on reflecting specific commercial or residential practice situations, rather than include general practice valuers. Although valuers may indeed seek qualification to carry out both residential and commercial valuation assignments (subject to country specific qualification criteria), a mixture of valuers with various kinds of educational and practical backgrounds may elicit result smoothing and hence hamper ecological validity of obtained evidence.

We conclude this review by stating that the gaps in research contributions are too substantial to ignore, most notably with respect to intrapersonal bias in familiar market settings, as well as interpersonal bias in both commercial and residential settings. For the robustness of evidence and stimulation of comprehensive understanding of judgement bias by the valuation sector, its clients and stakeholders, it is strongly recommended to substantiate the amount of research efforts on valuer behaviour in a number of areas as articulated above.

Notes

1. In the finance approach real estate is treated as a financial asset and is mainly concerned with issues of accuracy and reliability of valuations as a proxy for real estate pricing. See for an overview of the literature for example Clayton, Geltner, and Hamilton (2001), Fisher, Miles, and Webb (1999), and Crosby, Lavers, and Murdoch (1998).
2. Tversky and Kahneman (1974) and Evans (1989) identified four main types of heuristics used in problem solving, including anchoring and adjustment heuristics. Other types have been identified subsequently. See Havard (2001), Maule and Hodgkinson (2002) and Gallimore (1994) for an overview on heuristics typology.
3. Grey literature publications such as conference proceedings, industry research reports and working papers have been excluded from this search as they may lack stringent (peer-) review

quality protocols deemed relevant for sensitive research subjects as judgement bias and client pressure.

Disclosure statement

No potential conflict of interest was reported by the authors.

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