

Title: A Homeowner's Dilemma: Anchoring in Residential Real Estate Transactions

Authors:

Grace W. Bucchianeri

The Wharton School, University of Pennsylvania, 3730 Walnut Street, Philadelphia, Pennsylvania 19104, gwb@wharton.upenn.edu

Julia Minson

The Wharton School, University of Pennsylvania, 3730 Walnut Street, Philadelphia, Pennsylvania 19104, jminson@wharton.upenn.edu

Corresponding Author: Julia Minson

The Wharton School, University of Pennsylvania, 3730 Walnut Street, Philadelphia, Pennsylvania 19104, (P) 1-215-898-3025, (F) 1-215-573-3664, jminson@wharton.upenn.edu

Abstract:

We examine whether, and how, listing strategies impact sale prices in residential home sales. Literatures in housing economics, negotiations, and auctions offer diverse predictions around this question. On the one hand, housing studies typically treat home prices as an objective function of property and neighborhood characteristics. Yet, the large and robust literature on anchoring effects (Tversky & Kahneman, 1974) suggests a positive relationship between listing prices and sale prices. Finally, evidence from the auctions literature suggests the opposite pattern through herding behaviors. We analyzed more than 14,000 transactions, taking into account observable property heterogeneity, geographical location and timing of the sales. We find that higher starting prices are indeed associated with higher selling prices, consistent with anchoring. For the average home in our sample, over-pricing between 10 to 20 percent leads to an increase in the sale price of \$117 to \$163. This effect is particularly strong in areas with higher rates of mortgage foreclosure or serious delinquency. Additional analyses show that our results are unlikely to be driven by seller motivations or unobserved home qualities. We contrast our findings with recommendations and private beliefs of real estate agents, who provide services and advice for about 90 percent of home sales in the US.

Keywords: anchoring; behavioral economics; housing; listing prices

Classification Codes: D03, D12, D81, D83, Y80

JOURNAL OF ECONOMIC BEHAVIOR AND ORGANIZATION – IN PRESS

1. Introduction

For the vast majority of homeowners, the home is the dominant asset in their portfolio. For younger home-owning households, the house value can be several times the value of the household's net wealth (Flavin and Yamashita, 2009). Thus the sale of a home is likely to be the most significant financial transaction of the owners' lifetimes, and one that a typical home-owning household faces repeatedly: over a two-year period, 12% home-owning households in the US move (Ferreira, Gyourko and Tracy 2008, based on 1985-2005 AHS data). Among the many stressful decisions that go into a home sale, perhaps the most agonizing one involves the setting of the initial "listing price." Yet, despite the importance and frequency of home sales, the research literature is yet to offer a clear recommendation as to the basic strategy sellers should pursue. In the present research we explore this issue from the vantage points of three different literatures, analyze a large and diverse data set of market transactions, and contrast our findings with realtors' recommendations as well as their private beliefs.

Research on anchoring and insufficient adjustment (Tversky and Kahneman, 1974) has repeatedly demonstrated that exposure to even irrelevant numbers makes individuals' subsequent quantitative judgments assimilate to the "anchor." Anchoring affects the price that consumers are willing to pay for goods and experiences (Ariely, Loewenstein, Prelec, 2003; Green, Jacowitz, Kahneman, & McFadden 1998; Northcraft & Neale, 1989; Simonson & Drolet, 2004) and the outcomes of distributive negotiations (Galinsky, Leonardelli, Okhuysen and Mussweiler, 2005; Galinsky and Mussweiler, 2001; Galinsky, Mussweiler and Medvec, 2002). The available evidence for anchoring effects suggests that home sellers would benefit from setting higher listing prices.

This conclusion, however, is in direct contrast with most of the economic literature that

considers housing prices to be rational, and ultimately determined by characteristics such as location and amenities (Sheppard, 1999). From this perspective, market forces are expected to correct any strategic pricing behaviors. Laboratory results demonstrating a relationship between opening prices and selling prices are generally dismissed as the product of experimental demand in absence of real market conditions. Conversely, demonstrations of anchoring-like effects using market data are often critiqued for failing to sufficiently control for potential confounds.

A third literature, one dealing with auction behavior (Gneezy, 2005; Gneezy & Smorodisky, 2006) offers yet another set of predictions. A typical home sale begins with an auction-like process, where one or more buyers might submit an offer in response to a listing price. Recent findings show that auctions that open with low asking prices generate a greater number of bids and ultimately finish with higher closing prices (Ku, Galinsky and Murnighan, 2006; Ku, Malhotra & Murnighan, 2005; Simonsohn and Ariely, 2007). This pattern has been explained through “herding” behavior (Banerjee, 1992) whereby bids by earlier aspiring buyers signal that a particular item is competitively priced and lead others to enter the bidding. Indeed, an analysis of real estate-related web content reveals that professional consensus favors pricing a home low, in the hopes of starting a “bidding war.”

Work by Janiszewski and Uy (2008) recently examined the effect of listing prices in the residential housing market. These authors however, were interested in the effect of *price precision*, and thus chose to eliminate all transactions with multiple offers from their data set, leaving no room for testing herding behavior as an alternative explanation. Thus the question of whether a seller ought to price a good relatively high or relatively low in the context of a consequential information-rich market transaction remains very much unanswered.

In the current paper, we examine the question of initial listing prices in the real estate

market using two methods. First, we gather professional advice available to homeowners with access to the internet. We analyzed the content and the tone of the published articles to find out what strategy real estate agents recommend. We further investigate private beliefs of real estate agents by soliciting their recommendations regarding specific, randomly chosen properties in their general geographical area of practice (Study 1). We then compare these recommendations and beliefs to findings based on data concerning all single-family home sales in Delaware, New Jersey and Pennsylvania listed through the Multiple Listing Service (MLS) between January 2005 and April 2009 (Study 2).ⁱ

While the online recommendations of real estate agents seem to favor underpricing, alluding to a potential herding effect, our market data do not provide any support for this strategy. In fact, underpriced homes systematically fared less well in the data we examined, even in hot markets with frequent transactions. On the other hand, our market data show evidence of an anchoring effect, even after controlling for “fishing” behaviors whereby home sellers wait for a longer period of time in order to receive a higher offer (Bokhari & Geltner, 2011). Private beliefs of agents seemed to be in line with our market findings, and not their public recommendations. When surveyed anonymously, real estate agents predicted that higher listing prices would lead to higher sale prices, even after we account for individual differences, property fixed effects, and listing time expectations.

We go beyond the prior literature in several ways. First we demonstrate the effect of listing strategies on final prices using a large data set of real market data, in the context of a high-stakes, information-rich transaction. Secondly, we utilize several novel empirical approaches to rule out alternative explanations that have plagued such attempts in the past. Finally, by comparing market data to recommendations of professional realtors we demonstrate a likely gap

in lay knowledge regarding the most consequential financial transaction of most consumers' lifetimes.

2. Study 1 – Professional Pricing Advice

In a preliminary investigation of professional consensus regarding over- and under-pricing, we first turned to the same source of knowledge as many home sellers: the internet. We examined the first 100 web pages returned for each of the following Google searches: “home + over-pricing + sell,” “home + under-pricing + sell,” “pricing + strategy + sell + home,” and “pricing + home + for + sale.” 297 of these pages contained professional advice regarding how the initial listing price should be set. Three raters, blind to hypothesis, concluded that of the 94 web pages that discussed under-pricing, 46% percent recommended it as a sound strategy. Conversely, of the 163 web pages that discussed over-pricing, 96% warned against it.

While this exploratory analysis provides an unambiguous characterization of the advice offered online, one might wonder about the sincerity of such advice. The real estate market is plagued by the standard agency problem since realtors receive only a small portion of the transaction price as commission (Anglin and Arnott 1991; Geltner, Kluger and Miller 1991; Levitt and Syverson 2008; Miceli, 1991; Rutherford and Yavas 2012). Furthermore, internet advice might not be reflective of the private beliefs of realtors. Thus in Study 1 we explored the extent to which realtors privately adhere to the publicly recommended under-pricing strategy by presenting expert participants with specific properties and soliciting their pricing recommendations and expectations regarding transaction outcomes.

2.1 Method

2.1.1 Participants: Thirty-five local realtors (42.9% female, 44.7 years old, 6.8 years of real estate experience) completed the study online between March 28 and May 2, 2011. We compensated participants by entering them into a lottery for a \$100 Amazon.com gift card.

2.1.2 Procedure: We randomly selected 10 homes listed for sale in Montgomery and Philadelphia Counties of Pennsylvania in October 2010. Each participant viewed detailed descriptive information regarding six randomly selected homes, three located in Montgomery County (“suburban setting”) and three in Philadelphia County (“city setting”). They then saw the median listing price of homes in the same zip code in October 2010 according to Zillow.com. Participants then provided a recommended listing price for the home and predicted the final sale price and time on market, given the listing price they had recommended.

2.2 Results and Discussion

After discarding data from one realtor who entered all the listing prices as \$1 and one observation from another realtor who entered the expected time-on-market as 169,000 days, we analyzed 203 observations. We defined “under-pricing” as recommending a price of 99% or less of the median price and “over-pricing” as recommending a price that is 101% of the median price.

Participants recommended under-pricing in 70.4 percent of cases. Ten of our 34 realtors recommending under-pricing on all six homes they evaluated, whereas the remaining 24 recommended a mix of over- and under-pricing strategies.

To examine participants’ expectations regarding the effect of their strategies on transaction outcomes, we regressed the percentage difference between the expected sale price and the reference price on the realtors’ recommended strategy, controlling for participant and

property fixed effects as well as the expected time-on-market. We found that when realtors recommended under-pricing they expected the home to sell for a significantly smaller amount than the reference price ($B = -6.21, t = -2.14, p < 0.05$). Furthermore, when realtors recommended over-pricing they expected the home to sell for a significantly higher price than the reference price ($B = 16.83, t = 3.58, p < 0.001$). Since property and realtor fixed effects were controlled for, this pattern is not driven by property characteristics or realtor disposition. Finally, we regressed realtors' expected time-on-market on the recommended pricing strategy as well as participant and property fixed effects. We found no significant relationship for either under- ($B = 7.02, t = 1.11, ns$) or over-pricing ($B = -4.53, t = -0.43, ns$).

Our data suggest that although realtors *recommend* underpricing, they *believe* that homes listed lower than comparable properties tend to sell for lower prices and homes listed higher than comparable homes sell for higher prices. Given that we find no relationship between the realtors' recommendations and their expectations regarding time on market, we cannot conclude that these recommendations are strictly self-serving. It might be that similarly to decision scientists, professional realtors entertain two competing sets of predictions about the effect of listing prices on selling prices: one based on herding and one based on anchoring. In Study 2 we use a large and diverse data set of transaction data to examine which of these processes actually takes place in a real market context.

3. Study 2: Listing Strategies in the Housing Market

In Study 2 we use a dataset of all residential real-estate transactions in DE, NJ and PA listed on the MLS from 2005 to 2009 in order to examine the relationship between listing prices and final sale prices. We utilize several novel empirical approaches to mitigate concerns over

alternative explanations based on seller motivations or property characteristics for any such relationship.

Laboratory studies of anchoring have identified two reasons why a higher listing price might ultimately lead to a higher selling price. First, individuals tend to adjust insufficiently away from salient anchors (Epley & Gilovich, 2006). Thus a home buyer exposed to a high listing price might adjust downward, but stop adjusting when they encounter the highest amount they would be willing to pay for the home. Furthermore, individuals tend to generate more arguments that are consistent than inconsistent with the anchor (Strack & Mussweiler, 1997; Mussweiler, Strack & Pfeiffer, 2000). Thus, a buyer exposed to a high-priced property might attend more to the attractive landscaping, than to the outdated plumbing. This “selective accessibility model” of anchoring has been invoked to explain the effects of opening prices on selling prices in laboratory negotiations (e.g. Galinsky & Mussweiler, 2001).

The main challenge in demonstrating such anchoring effects using market data is one of showing that the relationship between listing prices and selling prices does not simply arise from objective home qualities. Therefore, to identify the effect of over- or underpricing a home we first must identify the sale price that a given home *should* command based on objective characteristics if listing behaviors had no impact. To proxy the expected sale price based on objective characteristics such as the number of bedrooms, bathrooms, and lot size, we conduct a hedonic sale price regression using 331,541 home sales in a data set of all MLS transactions for Delaware, New Jersey and Pennsylvania from Jan 2005 to April 2009 ($R^2=0.785$). To demonstrate the robustness of our results, we also use a total of six alternative reference points other than the price predicted by our regression.

An additional challenge is that a home might be priced higher (or lower) because of

qualities that are important to buyers but unobserved by the econometrician (e.g. ample sunlight or a particularly attractive layout). To deal with this concern, for each listing that we were able to match to a previous sale, we calculated the component of the *previous* sale price that our hedonic regression did not predict. We interpret this as a measure of the time-constant unobserved home qualities that partly drove the previous sale price. As long as these qualities do not change significantly over time, the residual term from a previous sale price prediction will be a reasonable, if noisy, proxy for their impact on the future sale price.

Controlling for time-constant unobserved home characteristics still leaves the issue of time-variable home characteristics (e.g. a recent kitchen remodel) that might inflate the relationship between listing prices and selling prices. In the current investigation we also look at the effect of price heterogeneity in the zip code on the relationship between listing prices and selling prices. If the relationship between listing and sale prices is stronger in zip codes with high price heterogeneity, unobserved home qualities are of greater concern. In contrast, a weakened relationship between listing price and sale price in more heterogeneous zip codes would provide additional evidence for the selective accessibility interpretation of anchoring. Prior studies have demonstrated that “considering the opposite” reduces anchoring effects (Mussweiler, Strack & Pfeffer, 2000). A buyer being exposed to multiple houses with varied prices may be less influenced by the listing price of any particular house because information about alternative prices is readily available. In essence, high price heterogeneity makes it easier for buyers to “consider the opposite.”

In order to more rigorously test the herding prediction we look at the relationship between listing and sale prices overall, as well as in particularly “hot” or “cold” markets. Both the literature on auctions as well as the anecdotal accounts of realtors point to market thickness

as a moderator of herding. In other words, in order to create a bidding war by setting a low price, there must be many interested buyers in the market. Finally, in each analysis we control for time on market (Taylor, 1999), zip code, school district, listing office, year and month fixed effects to rule out seller motivation, local characteristics, and time trends respectively, as alternative explanations.

3.1 Method

3.1.1 Data

Main Data Set – Multiple Listing Service Data: We obtained data on all sold homes in Delaware, New Jersey and Pennsylvania that were listed through the Multiple Listing Service (MLS) from Jan 2005 to April 2009 (MLS data). After discarding non-arms-length transactions (for example, sales between family members) and extreme outliers (listings with a sale price below \$1,000 or a total area below 10 square feet), we retained 335,852 observations, across over a thousand zip codes (Table 1).

Repeat-Sale Data: For our main analysis we used the 14,616 complete records for homes that we matched to a previous sale. For home listings outside of Philadelphia County, we were constrained to matching repeat-sales between Jan 2005 to April 2009. We complemented the Philadelphia County MLS data with the complete home sale tax records for Philadelphia County from 1988 to 2004 (PHL data) containing 148,331 usable observations.

Creating the Predicted Sale Price: By performing a hedonic regression on the sale price per square foot using 331,541 home sales with adequate property and transaction information between 1988 and 2009 ($R^2=0.785$), we created a predicted sale price for each property *at the time of the listing* in the MLS data. The following variables were controlled for in the hedonic

regression on price per square foot: lot size, floor-to-area ratio, type of property (semi-detached, attached, detached), exterior material type, a garage dummy, number of fireplaces, a dummy for an irregular lot and central air conditioning, a quadratic time trend, as well as month, school district, and zip code fixed effects.

Market warmth: Depending on the year-on-year change in the housing transaction volume, each zip code in a given month and year was classified into one of the seven categories in terms of market warmth or thickness: hot (up by 30% or more), warm (up by between 20 to 30%), lukewarm (up by between 10 to 20%), cool (down by between 10 to 20%), cold (down by between 20 to 30%), dead (down by 30% or more), or neutral.

Price heterogeneity: For each zip code, we calculated the standard deviation of listing and sale prices during the previous six months. This reflects the variation in both the expectation and realization of prices for homes in each zip code. Price heterogeneity dummies were generated for each zip code, equal to one if the standard deviation of listing or sale prices in a given zip code was above median.

3.2 Empirical Strategy

Our main question concerning the role of relative listing prices in predicting home sale prices, can be estimated in the following way:

$$P^s = \alpha + \beta * P^e + \gamma_1 * P^e * (P^l - P^r | P^l - P^r > 0) + \gamma_2 * P^e * (P^l - P^r | P^l - P^r < 0) + \varepsilon$$

where P^s is the log sale price, α a constant term, P^e the log expected sale price in absence of listing behaviors, P^l the listing price, P^r the reference point and ε an error term. Thus $(P^l - P^r | P^l - P^r > 0)$ and $(P^l - P^r | P^l - P^r < 0)$ are indicators of over-pricing and under-pricing respectively and will be referred to as the pricing indicators collectively. γ_1 and γ_2 capture the differences in

the log sale price (expressed as a portion of the log expected price) due to listing behaviors. ε is an error term.

We proxy P^e using a predicted hedonic sale price derived from all property sales in our sample. We also match the previous sale of the property to the current listing and include the residual from the same predicted hedonic regression on the previous sale as an additional control.

We explore three main types of indicators to proxy the reference point P^r . First, we calculate the median sale and listing prices of all historical sales of similar homes in the zip code of a given listing during a 180-day window prior to the listing. Second, to alleviate the concerns related to market trends, we also calculate median listing prices of concurrently listed homes, instead of historical sales. We calculate all of these indicators by zip code only, and also by zip code and bedroom groups (1 to 3 bedrooms, 4 to 6 bedrooms, and 7+ bedrooms). The third metric is a predicted listing price derived from a hedonic regression of all listing prices in our sample. Regressing the listing price for 281,868 listings on property characteristics and zip code, school district, listing office, year and month fixed effects, we explained around 70 percent of the variation ($R^2=0.693$).

Thus after including all the controls listed above, we estimate the following:

$$P^s_{izt} = \alpha + \beta 1 * P^h_{izt} + \beta 2 * TOM_{izt} + \beta 3 * R_{izt} + \gamma 1 * P^h_{izt} * (P^l_{izt} - P^r_{izt} | P^l_{izt} - P^r_{izt} > 0) + \gamma 2 * P^h_{izt} * (P^l_{izt} - P^r_{izt} | P^l_{izt} - P^r_{izt} < 0) + D_z + D_s + D_l + D_{year} + D_{month} + \varepsilon_{izt}$$

where P^s_{izt} refers to the log sale price of a listing i located in zip code z at time t , P^h_{izt} the log predicted hedonic sale price, TOM_{izt} the number of days the listing spent on the market, R_{izt} the first-sale hedonic prediction residual, P^l_{izt} the listing price, P^r_{izt} a reference price, and D_z , D_s , D_l , D_{year} and D_{month} are the zip code, school district, listing office, year and month fixed effects respectively.

3.3 Results and Discussion

Overall results: Over-pricing and under-pricing demonstrate significant and opposing relationships with the log sale price, controlling for the predicted hedonic sales price, the residual from prior sales, zip code, month, time on market and listing office. Specifically, over-pricing is positively correlated to the log sale price while under-pricing is negatively correlated to it. Furthermore, the extent to which over- or under-pricing relates to the log sale price increases with the extent of over- or under-pricing. These results are quantitatively and qualitatively similar across all reference points we considered (Table 2).

To put these results in context, consider that a home that is listed 10 to 20 percent higher than other homes in the neighborhood, will command an *additional* increase of 0.05 to 0.07 percent in the sale price for each 10 percent increase in the expected price. Evaluated at the average sale price in our sample, this translates to an additional increase in the sale price of \$117 to \$163. For a home that is listed 20 percent or higher than other homes in the neighborhood, the additional increase from overpricing for each 10 percent increase in the expected sale price amounts to 0.16 to 0.22 percent of the sale price, which is \$373 to \$513.

Market warmth: Interacting the relative price measures with market warmth (or coolness) indicators points to little or no variations in the relationship between pricing strategies and the log sale price by the level of activity in the local market. We do not find evidence that under-pricing is effective in hot markets. Although it is possible that herding behavior can take place under some more specific market conditions, our very large data set of transactions from five years and across three densely-populated states provides no evidence for it.

Heterogeneity of listing prices: Greater listing price heterogeneity in a given zip code

significantly decreases the relationship between pricing strategies and log sale price. This is again true across multiple specifications. This pattern is clearly in line with an interpretation of anchoring based on availability of anchor-consistent information (Strack and Mussweiler, 1997). In zip codes with high listing price heterogeneity, the presence of homes with similar basic characteristics listed at different prices may provide sellers with salient anchor-disconfirming evidence. Furthermore, if unobserved home qualities were the main driver of our findings, we would have expected them to play a greater role in more heterogeneous zip codes, leading to an amplified, not attenuated, listing price effect (Tables 3A and 3B).

Distressed zip codes: Being located in a distressed zip code exacerbates the impact of over- and under-pricing on the sale price. The differences are substantial and economically important: compared to a zip code with a zero rate of foreclosure or serious delinquency, the impact of over-pricing in a zip code with an average rate of foreclosure or serious delinquency increases by around 0.5 percentage points. Similarly, the negative impact of under-pricing in a typically distressed zip code is more severe by 1 percentage point than in a zero-foreclosure or serious delinquency zip code. Evaluated at the median home in our sample, this amounts to doubling both the over- and under-pricing effects in the average zip code as compared to the zero-distress zip code (Table 4).

While interesting in their own right, these results offer additional evidence that unobserved qualities are not the main driver of our results. Due to the well-documented damage done to homes facing imminent foreclosure (Skogan, 1990), unobserved qualities likely play a more prominent role in explaining the under-pricing effect. This asymmetrical amplification of the pricing effects is not shown in our data. In fact, the symmetrical amplification of the pricing effects is again consistent with anchoring, which has been shown to be stronger in environments

with greater uncertainty (Mussweiler & Strack, 2000).

4. General Discussion

A home sale is the most significant financial transaction undertaken by the average home-owning household. Despite the high-stakes and deliberative nature of this transaction, prior research has not offered a conclusive answer regarding the optimal strategy that sellers should pursue. Our work shows that although most professional advice recommends underpricing, over-pricing one's home relative to any of several benchmarks used in our analyses results in a higher sale price, controlling for how long one waits to sell. These results emerge when we include a variety of controls for unobserved home quality and time-on-market. Because we use data from a high-stakes, information-rich context, it cannot be argued that the observed effect is merely the result of individuals' failure to sufficiently consider their actions, lack of available decision aids, or absence of other alternatives. The effect we demonstrate is robust and significant.

Our research goes beyond prior attempts to demonstrate pricing effects in the real-estate domain. First, we use a more comprehensive data set that allows us to experiment with a wide array of reference points and to more fully alleviate concerns about unobserved variables, including home qualities, marketing strategies promoted by the listing offices, time on market, as well as zip code, school district, listing office, year and month fixed effects. Secondly, we explore the possibility that over- and under-pricing might vary by the local market conditions. We use both the zip code-level transaction volume changes and information on listing price heterogeneity to provide a more rigorous test of both the herding and anchoring hypotheses. Contrary to commonly cited anecdotes concerning market excitement and bidding wars, our

results point to little or no herding effect in a hot market.

Our findings prompt the question as to why we did not observe a herding effect, given the frequency of references to bidding wars in lay discourse. The literature on auction behavior makes it clear that herding requires a thick market with multiple buyers acting concurrently. It may be the case that this is simply not possible in the case of residential real-estate where buyers are too few and too dispersed to influence each other. Furthermore, the only prior evidence of herding in real-estate contexts comes from anecdotal accounts of bidding wars in extremely “hot” markets. Such accounts are suspect for at least three reasons. First, realtors labor under an agency problem whereby they are incentivized to set prices lower in order to increase the probability of a home sale (Levitt and Syverson 2008). Thus relating stories about bidding wars is very much in line with their self-interest. Secondly, the availability heuristic (Tversky & Kahneman, 1973) might lead “bidding war” stories to appear more frequent than they really are because they are more memorable than more prosaic home-selling experiences. Finally, due to the nature of anecdotal evidence, even in the case of a bidding war, we can never know what the sale price would have been had the listing price been higher.

While our findings directly contradict the advice most real-estate professionals offer to their clients, they seem to be in line with the private beliefs of realtors. Participants in Study 1 recommended under-pricing in the majority of cases, while at the same time expecting this strategy to lead to lower sale prices. The flavor of the warnings against over-pricing common in the online content we collected is well-captured by an article from About.com with the attention-grabbing headline “The Worst Home Selling Mistake.” The article relates the history of a specific house that according to the author never sold due to agent inexperience and seller greed. It is now “...stale, dated, a market-worn home that was over-priced for too long.” Our findings

based on market data, however, should give serious pause to any seller who is tempted to under-price a property in the hopes of generating a “bidding war” per the advice of their realtor.

References

Anglin, P.M., Arnott, R., 1991. Residential Real Estate Brokerage as a Principal-Agent Problem. *Journal of Real Estate Finance and Economics* 4 (2), 99-125.

Ariely, D., Loewenstein, G., Prelec, D., 2003. Coherent Arbitrariness: Stable Demand Curves Without Stable Preferences. *The Quarterly Journal of Economics* 118 (1), 73-106.

Banerjee, D., 1992. Ethical behavior of IS personnel: in search of a behavioral model. Unpublished doctoral dissertation. Fayetteville: University of Arkansas.

Bokhari, S., Geltner, D., 2011. Loss Aversion and Anchoring in Commercial Real Estate Pricing. *Real Estate Economics* 39 (4), forthcoming.

Epley, N., Gilovich, T., 2006. The anchoring and adjustment heuristic: Why adjustments are insufficient. *Psychological Science* 17, 311–318.

Ferreira, F., Gyourko, J., Tracy, J., 2008. Housing Busts and Household Mobility. *Journal of Urban Economics* 68 (1), 34 - 35.

Flavin, M., Yamashita, T., 2002. Owner-occupied Housing and the Composition of the Household Portfolio. *The American Economic Review* 92 (1), 345-362.

Galinsky, A. D., Leonardelli, G. J., Okhuysen, G. A., Mussweiler, T., 2005. Regulatory focus at the bargaining table: Promoting distributive and integrative success. *Personality and Social Psychology Bulletin* 31: 1087-1098.

Galinsky, A.D., Mussweiler, T., 2001. First Offers as Anchors: The Role of Perspective-taking and Negotiator Focus. *Journal of Personality and Social Psychology* 81 (4), 657-669.

Galinsky, A.D., Mussweiler, T., Medvec, V.H., 2002. Disconnecting outcomes and evaluations: The role of negotiator focus. *Journal of Personality and Social Psychology* 83 (5), 1131-1140.

Geltner, D., Kluger, B., Miller, N., 1991. Optimal Price and Selling Effort from the Perspectives of the Broker and Seller. *AREUEA Journal* 19 (1), 1-24.

Genesove, D., Mayer, C., 2001. Loss Aversion and Seller Behavior: Evidence from the Housing Market. *The Quarterly Journal of Economics* 116 (4), 1233-1260.

Gneezy, U. 2005. Step-Level Reasoning and Bidding in Auctions. *Management Science*, 51 (11), 1633-1642.

Gneezy, U., Smorodinsky R., 2006. All-pay auction: An experimental study. *Journal of Economic Behavior and Organization*, 61, 255-275.

Green D., Jacowitz K.E., Kahneman D., McFadden D., 1998. Referendum contingent valuation, anchoring, and willingness to pay for public goods. *Resource and Energy Economics* 20 (2), pp.

85-116.

Janiszewski, C., Uy, D., 2008. Anchor Precision Influences the Amount of Adjustment. *Psychological Science* 19 (2), 121-127.

Ku, G., Galinsky, A.D., Murnighan, J.K., 2006. Starting Low But Ending High: A Reversal of the Anchoring Effect in Auctions. *Journal of Personality and Social Psychology* 90 (6), 975-986.

Ku, G., Malhotra, D., Murnighan, J.K., 2005. Towards a Competitive Arousal Model of Decision-making: A Study of Auction Fever in Live and Internet Auctions. *Organizational Behavior and Human Decision Processes* 96 (2), 89-103.

Levitt, S.D., Syverson, C., 2008. Market Distortions When Agents Are Better Informed: The Value of Information in Real Estate Transactions. *The Review of Economics and Statistics* 90 (4), 599–611.

Miceli, T.J., 1991. The Multiple Listing Service, Commission Splits and Broker Effort. *Real Estate Economics* 19 (4), 548–566.

Mussweiler, T., Strack, F., Pfeiffer, T., 2000. Overcoming the Inevitable Anchoring Effect: Considering the Opposite Compensates for Selective Accessibility. *Personality and Social Psychology Bulletin* 26 (9), 1142-1150.

Rutherford, R., Yavas, A., 2012. Discount Brokerage in Residential Real Estate Markets. *Real Estate Economics* 40 (2), forthcoming.

Sheppard, S., 1999. Hedonic Analysis of Housing Markets. In: Cheshire, P., Mills, E.S. (Eds.) *Handbook of Regional and Urban Economics*, Vol. III. North Holland: Elsevier, 1595-1635.

Simonsohn, U., Ariely, D., 2007. When Rational Sellers Face Non-Rational Buyers: Evidence from Herding on eBay. *Management Science* 54 (9), 1624-1637.

Simonson, I., Drolet, A., 2004. Anchoring Effects on Consumers' Willingness-to-Pay and Willingness-to-Accept. *Journal of Consumer Research* 31 (3), 681-690.

Skogan, W.G., 1990. *Disorder and Decline: Crime and the Spiral of Decay in American Neighborhoods*. New York: Free Press.

Strack, F., Mussweiler, T., 1997. Explaining the enigmatic anchoring effect: Mechanisms of selective accessibility. *Journal of Personality and Social Psychology* 73, 437-446.

Taylor, C., 1999. Time-on-the-Market as a Sign of Quality. *Review of Economic Studies* 66 (3), 555-578.

Tversky, A., Kahneman, D., 1974. Judgment under uncertainty: Heuristics and biases. *Science* 185, 1124-1131.

Endnote

ⁱ It is estimated that around 90 percent of all homes sales are listed on the MLS. (source: <http://www.forsalebyownerhomes.com/mlslisting.html>)